



Knowledge Makers

Special Edition:
*Indigenous Women, Indigenous Peoples' food and knowledge systems,
and Climate Action.*

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Oneka Karonya McCormick

is a Tkemlups te Secwepemc band member currently in Grade 12 at Kamloops School of the Arts. Oneka has been perfecting her artistic talents since she was 5 yrs old. Oneka's Mom is Secwepemc and her dad is Mohawk. Oneka's name is Mohawk and means water, while her middle name means looking up at sky.

Although she just turned 18 she has had dozens of commissions for her art. Her career plan is to study art at University and to explore her other passion for working with small animals.

She designed this logo to be reminiscent of warm summer days berry picking in Secwepemcù'ecw and chose to depict the back of the women's heads so that viewers could see themselves in these women.

More than just a logo, this image embodies the deep connection between generations, rooted in tradition and guided by the love and knowledge held by Indigenous women around the world.

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Knowledge Makers Special Edition

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As we celebrate the success of this collaboration, we send our respect to the Tk'emlups te Secwépemc Nation and the T'exelc Nation within Secwépemc'ulucw, the traditional and unceded territory of the Secwépemc, the territories of the Stat'imc, Nlaka'pamux, Tsilhq'otin, Nuxalk, Dakelh, and Métis Nations. We acknowledge the fires of authority that continue to burn in these lands, guided by gratitude for the hospitality received.

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Finally, and most importantly, we thank the 21 Indigenous Women who committed themselves to the Knowledge Makers Program and whose commitment has illuminated opportunities for generations to come. We look forward to hearing about your research journeys and continued leadership in coming years.

We honour the Indigenous Peoples you come from across the 7 socio-cultural regions – Africa, the Arctic, Asia, Central and South America and the Caribbean, Eastern Europe, Russian Federation, Central Asia and Transcaucasia, North America, and the Pacific: Metis Nation (Canada); Pueblo Nation, USA; Wampanoag Tribe of Gay Head (Aquinnah), USA; Sisseton Nation, USA; Māori, New Zealand; Kiribati; Kanaka Maoli, Hawai'i; Afro-Binnizá from the Isthmus of Tehuantepec, Mexico; Wayuu, Venezuela; Maya Chol, Mexico; Kankanaey Igorot, Philippines; Tharu, Nepal; Garo, Bangladesh; Lotha Tribe, India; Ogiek, Kenya; Maasai, Tanzania; Kel Tamasheq, Burkina Faso; Evens, Russia; Buryats, Russia; Karachay, Russia; Saami, Sweden;

Disclaimer: The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

COLLECTIVE VOICES AROUND THE SUN

In early February 2023, we gathered online for our first welcoming call of the international Indigenous Women's research cohort. The 21 Indigenous Women selected for the cohort span the seven socio-cultural regions of the world, 21 Indigenous Peoples and 16 countries. For everyone gathered on the call that day, the sun was in a different place in the sky - for some it was rising, for some it was high in the sky, for some it was setting, and for some it was below the horizon.

As we opened the call, Cheslatta Carrier Elder Joanne Brown said, "This is the largest sacred circle I have ever been part of with the sun at the center." Her words brought into focus how significant the gathering was and journey ahead for this 8th Volume of the Knowledge Makers Journal, Special Edition - "Indigenous Women, food systems, and climate change."

There are 240 million Indigenous Women in the world, representing half of the total Indigenous populations (ILO, 2020). The number of Indigenous Women in the world exceeds the entire population of countries like Nigeria, Pakistan, or Brazil. Indigenous Women live across more than 90 countries, belonging to more than 5,000 different Indigenous Peoples across the seven socio-cultural regions of the world. In total, Indigenous Women represent 6.2 percent of all women in the world (ILO, 2020).

Currently and since time immemorial, Indigenous Women have played a fundamental role in preserving and perpetuating Indigenous Peoples' food and knowledge systems, livelihoods, languages, cultures, cosmologies, governance systems and territories. However, the systemic lack of recognition of their individual and collective rights, combined with the multiple forms of discrimination they face including the lack of access to their ancestral lands, natural resources, decision-making spaces, health care, economic opportunities, among others, place them in situations of increased vulnerability, poverty, violence, conflict, and food insecurity

(FAO, 2021).

Indigenous Women are often marginalized from decision-making processes both within and outside their communities. This blocks them from contributing to the processes of developing solutions and/or policies that affect their lives and communities. The lack of disaggregated data and dedicated research with, by and for Indigenous Women worsens the invisibility that Indigenous Women face. The gap further impedes the design of adequate policies and programs that address their specific challenges (UNPFII Report, 2016).

Since 2015, FAO has collaborated with different Indigenous Peoples' and Women's organizations to implement relevant initiatives to contribute to the empowerment of Indigenous Women and to enhance their influence in decision-making processes and global debates on food systems, climate change, and access to land and natural resources. In 2018, in response to Indigenous Women's requests, FAO in collaboration with two Indigenous Women's organizations launched the "Global Campaign for the Empowerment of Indigenous Women for Zero Hunger". Its main initiative, "The Violet Chair" was represented by an empty purple chair at decision-making tables in international spaces of the United Nations - bringing into focus the absence of Indigenous Women in the decision-making spaces that affect their lives. The Violet Chair Initiative was a call to guarantee Indigenous Women full and effective participation in policy discussions and global debate topics that affect them. More than 95 organizations and 15 countries supported the campaign. While these global initiatives were being led by the Indigenous Peoples Unit at the FAO headquarters in Rome, Italy, Dr. Sereana Naepi and Dr. Airini were initiating their own groundbreaking work for young Indigenous researchers on the other side of the world on the traditional lands of the Tk'emlups te Secwe'pemc with Secwe'pemc'ulucw at Thompson Rivers University in Kamloops, British Columbia.

The complementary works of the Knowledge Makers Program and FAO did not cross until

2021, though there was a quick and simultaneous interest and recognition of each other's work. The design of the Indigenous-led Knowledge Makers Program as a "collaborative teaching initiative where Indigenous students learn how to research, and how to publish research, as Indigenous researchers" through a "multi-modal approach" spoke directly to one of the calls to action from the Indigenous Women's Global Empowerment Campaign – the need for Indigenous-led research for and by Indigenous Women.

The Knowledge Makers Program's intentional approach to building the space, process, and opportunity for Indigenous-led research was an answer to this international call. Thus in 2021, the conversations and brainstorming began between Thompson Rivers University – All My Relations Research Centre and the FAO Indigenous Peoples Unit, exploring what might a collaboration and partnership look like.

Ultimately, in 2022, Thompson Rivers University – All My Relations Research Centre – Knowledge Makers Program and FAO joined forces to implement a special program to strengthen the research and knowledge generation opportunities for and by Indigenous Women. Together we designed a pilot project for an international cohort of Indigenous Women with the online curriculum of the Knowledge Makers Program and the peer-reviewed writing and publication process of the journal. We sent out an international call for papers to the seven socio-cultural regions of the world inviting Indigenous Women to apply for the Special Edition of the Knowledge Makers Journal. This was an opportunity to advance their research for Indigenous Women, Indigenous Peoples' food and knowledge systems, and climate change. In total, we received 101 applications from 30 different countries. Through an extensive review and selection process, 21 Indigenous Women were selected, with diversity across socio-cultural regions, Indigenous Peoples, and research topics.

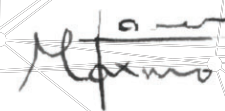
Through this program, Indigenous Women researchers were guided through discussions and teachings to wrestle with the questions and challenges of research, consider the approach of research as service and engage with the ethical questions of Indigenous Peoples' systems of knowledge and research, and to amplify the influence of their voice in the decision-making

processes that affect them. Dr. Naepi encouraged the women of this cohort to engage with the question, "If you were writing for the UN Secretary General, Mr. Antonio Guterres, what would you say?" Aligned with the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), this Special Edition emphasizes the rights of Indigenous Peoples' knowledge systems, giving special attention to the rights of Indigenous Women. It serves as a milestone, showcasing the collective achievements of 21 Indigenous Women from the seven socio-cultural regions who have not only invested time and energy into their own research skills and pressing topics for their communities, but they have also contributed to the global discourse on Indigenous-led research.

This Special Edition is a call for justice, equity, and a sustainable future. To quote, Dr. Airini, "This is Knowledge of Standing in the World, it is not miraculous. It is what has kept us going and helped us survive."

Today, we send our deepest respect, gratitude and acknowledgments to the Indigenous Women who engaged in this research cohort, overcoming significant barriers and challenges to do so. We express our hopes that this experience is the beginning of a far-reaching ripple effect that will empower them to inform and influence the decision-making spaces affecting their lives. It was not an easy nor simple process, it exposed the challenges, realities, barriers, and hard questions for Indigenous researchers. It is also just a glimpse into the expansive brilliance and skillful network of Indigenous Women around the world who not only deserve to be at the table but must be at the table for the future of Indigenous Peoples and this Planet.

FAO humbly thanks and honors the Knowledge Makers who have come before this 8th Volume and celebrates all the forthcoming Knowledge Makers.



Máximo Torero Cullen
FAO Chief Economist



Coyote Brings the Food Conference - ©OKGN.Co/Beth Taylor



Will Garrett-Petts & Sukh Heer Matonovich

Professor and Associate Vice-President Research & Graduate Studies

Thompson Rivers University

CO-CREATING BUT NOT HOLDING SPACE: ALIGNING AND ALLYING INSTITUTIONAL RESEARCH SUPPORT WITH AN INDIGENOUS-LED RESEARCH DEVELOPMENT PROGRAM

"We are all born to make a difference and in order to do this we need to be informed. The Secwépemc Health Caucus is utilizing this forum to establish concrete steps on how to build research capacity and use new relationships to build self-determination by informing governance decisions with knowledge and information relevant to the Secwépemc Nation."

Kukpi7 Christian Secwépemc Health Caucus Chair (2014)

"First Nations recognize the importance of research and many are in the process of rebuilding their regulatory environment related to the ownership and control of data. Research partnerships with individuals and organizations must be built on a solid foundation. We hope to move this work forward together during the Interior Research Forum."

Gwen Phillips First Nations Health Council (2014)

We want to thank the Knowledge Makers program for their invitation to reflect on and share our experience—as an introduction to this special international issue of the Knowledge Makers Journal. For us, as university administrators, the Knowledge Makers is both a program and a journey.

A key moment in that journey began in 2014 with the hosting of the first-ever Interior Nations Research Forum in partnership with the Secwépemc Health Caucus and the First Nations Health Authority. Chiefs from fifty-four First Nations communities in the Interior of British Columbia were joined by scholars, elders, and representatives from the region's seven Indigenous Nations, in what was hoped to be the first in a series of annual gatherings. The Forum's objectives included a strengthening of relationships among the Interior Nations with academics and universities in relation to Indigenous research, as well as the shaping of the Interior Nation's Research Agenda, with a focus on ethics and wellness. This gathering provided a kind of watershed moment, an opportunity for Nations in the Interior to lead the discussion and collaborate with TRU partners on defining what meaningful research means to each Nation, and how partners might work best with their communities to serve and involve them in effective and innovative ways.

Dialogue sessions included consideration of

- First Nations Data Governance
- Sharing Research Experiences
- Respectful Engagement
- Research Ethics
- Community and Population-Based Public Health Research
- Capacity Building

A video documenting the forum was co-created and co-produced:



Interior Nations Research Forum 2014

Interior Nations Research Forum 2014
©First Nations Health Authority

Inspired in part by the 2014 Interior Nations Forum, the Knowledge Makers program began with the aim of closing achievement gaps between Indigenous and non-Indigenous learners. A little over nine years ago, in concert with the Forum, TRU's Director of Research and Graduate Studies completed an analysis of our Undergraduate Research Experience Program (UREAP)—a capstone, paid research experience available to students across campus. Despite the fact that Indigenous students represented approximately ten percent of TRU's enrolment, the Director found that, over a five-year period, on average only two percent of the UREAP awards were going to Indigenous undergraduates. Knowledge Makers was created as a response, with the ambition of advancing equitable research experiences for all students.

In consultation with the University's Office of Research and Graduate Studies, Drs. Airini and Naepi, the co-founders of Knowledge Makers, wisely advocated for more than a cosmetic change to the existing program; they proposed instead a complete re-thinking of undergraduate research training, arguing that, in the spirit of Indigenization, we needed to reframe conventional research practices, moving the locus of attention from individual and disciplinary knowledge production to an Indigenous-led learning community approach.

Instead of the mentor/mentee model informing the UREAP, Knowledge Makers took up the project of Indigenous advancement, intentionally developing young researchers by welcoming them into a community of Indigenous scholars, and introducing them as a cohort to multiple worldviews, ancestral knowledge, Indigenous research methods and cultural protocols, and a special appreciation for the impact of research practices and outcomes on the communities we serve. This collaborative effort is supported by university leaders, Elders, faculty, staff, and community members, who contribute to this non-credit, four-month annual program. Research development is characterized in terms of five working assumptions and practices

The results have been nothing short of stunning. Most graduates of the Knowledge Makers program speak of the experience as “empowering” and “transformational”; and the program has been recognized nationally and internationally, with awards and endorsements from the Society for Teaching and Learning in Higher Education and Mitacs (a national, not-for-profit organization that has designed and delivered research and training programs in Canada for 20 years).

Today, Knowledge Makers is widely regarded as a significant response to Canada's Truth and Reconciliation Commission's Calls to Action—and a complement to TRU's Coyote Project (a pan-university commitment to improving Indigenous student success), to Ombaashi (an international and national network for mentoring Indigenous researchers), and to the University's All My Relations Research Centre (which brings together “regional, national and international Indigenous researchers to work in partnership with Indigenous communities to identify, research, advance and build capacity and capability in Indigenous community wellness”). As university administrators working alongside, with, and for our Indigenous research community, it is our contention that the Knowledge Makers has moved TRU's understanding of research and research training from a deficit model (addressing achievement gaps) to a pedagogical model of celebration, mutual respect, equity and Indigenous advancement.

As a Research Office we are tasked with looking at an array of equity, diversity, and inclusion issues that link undergraduate research to themes of racial equity and reconciliation. For the last several years we have been addressing in an intentional manner the question of equitable access to research via our “Research Coach program,” via a review of adjudication practices, and, especially, via support for the Knowledge Makers. Where the Knowledge Makers differs is in its position within the university, and within the other programs we support: for it is Indigenous led and delivered.

From the beginning we were welcomed into the learning community workshops, to speak with the students and share a lunch. In addition, we were asked to write introductory comments to each annual edition of the Knowledge Makers Journal. This introduction is drawn from those earlier introductions, as our attempt to reflect upon and seek to extend an invited conversation on an extraordinary research journey.

On the first day of the Knowledge Makers meetings, eight years ago, we were each asked to say why we thought Indigenous research matters. One of us remarked that the principles of solid Indigenous research activity, working respectfully and effectively with communities, offer a template for all community-engaged research activities. Since that day, and reflecting further on the importance of the Knowledge Makers initiative, we've come to recognize that in addition to holding up Indigenous research as a model of best practices, we also need to acknowledge that there is an activist impetus at play, what the intercultural scholar Dylan Rodriguez (2012) has called an “urgency imperative.”

We too feel that sense of urgency and recognise the need for critique, for pedagogical insurgency, and to “denaturalize” those aspects of the academy that uncritically privilege the status quo or otherwise limit intercultural teaching and learning possibilities.

We like to think that research and knowledge creation, in all their forms, are the heart and soul of undergraduate research at our university. They inform who we are and why we do what we do as teachers, scholars, students, support staff, and administrators. Woven throughout TRU’s Strategic Research Plan is an awareness of the importance of place, relationships with community and, in particular, a mandate for awareness, appreciation, and cooperation with Indigenous communities. Our university has made the strategic decision to identify Indigenous research and in particular “Seeking truth, reconciliation, and rights through Indigenous-led research and capacity building” as a priority area for research, capacity building and knowledge mobilization.

Our university recognizes the importance of increasing its complement of Indigenous scholars—to strengthen and sustain research activity for Indigenous advancement; and we see the Knowledge Makers as an embodiment of these aspirations, providing an important new initiative that expands the network of Indigenous undergraduate students who engage in research. In addition, Knowledge Makers models possibilities for Indigenized research mentoring.

The deep relationship between the Secwépemc people and the traditional lands on which TRU resides is commemorated on campus with an Indigenous territorial marker located on the first floor of the Old Main Building. It was created by Secwépemc artists Rod and Ron Tomma and Mike Peters. Made from a rare form of quartz, communicating through virtue of its physical presence and pictographs, this marker is both an acknowledgement of the territory and an invitation to situate ourselves in relation to this land and its history.

The Knowledge Makers program presents another kind of marker, and another form of invitation to a new generation of scholars. At root, Knowledge Makers constitutes a unique learning community gathering on traditional Secwépemc territory, where we honour the culture, language, and traditions of the Secwépemc people and champion the holding and making of knowledge. The Knowledge Makers gives testimony to the potential for powerful links between educational and research institutions and this land.

Over the last eight years, Knowledge Makers has

expanded and given a home to the network of Indigenous undergraduate students who seek engagement in research. The results are significant: more Indigenous student publications, research awards, employment in research assistant roles, scholarships, and admission to graduate studies. We have seen, too, how the Knowledge Makers models possibilities for Indigenized mentoring practices, which have attracted national and international interest—including, now, national recognition in the form of the Alan Blizzard Award celebrating excellence in teaching and learning; and international recognition from its partnership with the Food and Agriculture Organization of the United Nations, inviting Indigenous women from seven socio-cultural regions to participate in an online version of the program. Led through Indigenous expertise, this whole-of-university initiative has support from more than forty colleagues across TRU—a holistic effort in teaching, learning, and research that puts students at the centre of knowledge creation and knowledge sharing.

This is part of a coming together with The Coyote Project, our local collective response to implementing the Truth and Reconciliation Commission’s Calls to Action, with Knowledge Makers making a place for itself alongside the Ch’nook Scholars Program, Orange Shirt Day (remembering the legacy of residential schools), our faculty storytelling series called Towards Indigenizing Higher Ed, the work of the All My Relations Research Centre, our Indigenizing Open Learning initiative, Bearing Witness through the School of Nursing, our Library commitment to Digitized Secwépemc Resources, Indigenous Awareness Week, the establishment of the First Nations and Indigenous Affairs Committee of Senate, the Faculty Association’s Decolonization, Reconciliation and Indigenization Committee, and the Partnership Agreement between Tk’emlúps te Secwépemc and TRU. Most recently, TRU’s Vision Statement calls for the nurturing of “a flourishing relationship with the Secwépemc people on whose lands we reside. Members of our community will give exceptional consideration to Secwépemc world view and belief system. We will support thriving Secwépemc culture through respectful actions in research, teaching and service.”

These are important markers of respect and understanding that deserve to be celebrated and built upon as a context to ground the Knowledge Makers and its accomplishments. Yet we recognize that we have much work to do. The Knowledge Makers is a key part of what, within the University, is still very much a work in progress, aiming toward making education and the research enterprise, making the university, more fully equitable, diverse, and inclusive.

Five Assumptions of Knowledge Makers

| Assumption | Practice |
|--|---|
| We draw upon the knowledges of our ancestry | Knowledge makers are encouraged to bring the knowledge of their ancestors into the research space. |
| We value Indigenous research methods as expanding the research canon, resisting ' <u>miraculating</u> ' the Indigenous | Knowledge makers engage in being critical, not only of mainstream research methods and methodologies but also of Indigenous research methods and methodologies, identifying how particular research methods and methodologies may not work for their project. They are also encouraged to consider how current research processes serve or don't serve Indigenous peoples |
| We take a strengths-based approach | Within Knowledge Makers, those involved in the program consciously work against deficit thinking, research design and words. |
| Our research will be a form of service | Knowledge makers are encouraged to consider and understand that action and change are necessary for our research process. |
| We commit to legacy | Within Knowledge Makers, those involved in the program understand that Knowledge Makers is creating a legacy of Indigenous researchers and that these researchers need to be able and motivated to undertake quality research that positively impacts Indigenous communities. |

Source: Naepi, S., & Airini (2019)

We have been giving considerable thought to the notion of “making knowledge” and its relationship to the creation of learning communities. What struck us initially is that the opportunity for learning, especially when we seek to empower students as researchers, becomes highly reciprocal. The Knowledge Makers takes for granted that students, teachers, and mentors alike will all benefit. More important still, we are learning that, when addressed in an Indigenous community context, the nature of new knowledge creation requires special consideration of the community’s collective memory. As TRU elder Mike Arnouse put it during one of the gatherings with students, “Things I have heard at Knowledge Makers are old but they seem new because people forgot them.”

Eber Hampton (1995) published an article nearly three decades ago in the *Canadian Journal of Native Education* titled “Memory Comes Before Knowledge.” An extraordinarily profound and provocative title: It points to the multiple ways our individual and collective pasts inform the present; but more important still, it underscores a universal truth: that contributions to new knowledge are built upon, shaped by, and filtered through past experiences and understandings.

We also want to reflect on the name of the educational program, the Knowledge Makers, for we think it too embodies the premise that memory comes before knowledge. We are drawn to the proposition that knowledge is something “made.” As researcher administrators, we speak more often of discoveries and innovations—as if new knowledge has been hiding, or is an extant discovery simply needing a clever twist or refinement, or a novel technical adaptation. To speak of making knowledge, however, is to invoke consideration of process, of qualities, of potentials and of materials.

Haida artist Bill Reid (nd.) reminds us of how we employ memory intentionally as a prerequisite to knowledge making:

I wish that the objects which come from my hands play the role of “Revelators” of ancient representations. It is my hope that the people of today and of tomorrow become aware of the existence of the Northwest Coast and feel enriched by the knowledge they will acquire from this extraordinary testimony....

Knowledge is not simply discovered or argued: it is revealed, made available, and shared through physical and mental effort; informed by past practice and history; negotiated through tradition, relationships, and received

ways of thinking; and deepened through personal and community engagement. We are learning that to be a “knowledge maker” is to touch and honour and work with memory as a prerequisite for contributing new understandings, new ways of knowing.

The Knowledge Makers faculty, students, and elders—and in this special issue, fourteen Indigenous women from around the world—are in the process of telling their own stories—through the creation of their learning community, through the writing of their annual *Journal*, through articles and presentations written by the faculty, and through the Knowledge Makers dinner, which brings together the students, their families, elders, the faculty, the University President, invited deans, and representatives from the Research Office as honoured guests. What we offer here is a reflection on how the principles informing the program impact and help sensitize us to new administrative approaches to university research program development generally.

Our administrative strategy has been to fund, to advise, to be present when called upon, but to neither design nor lead the program. In other words, we’ve undertaken the co-creation of a racially and culturally equitable space without holding that space—and in the process we are coming to terms with how the Knowledge makers can help inspire our university’s approaches to culturally appropriate and effective mentoring, to principles of knowledge keeping and sharing, the proposition that equity is foundational to high impact learning, and to a more nuanced and inclusive notion of research and research administration.

While the reaching out to and inclusion of international Indigenous voices points to an expansion of the Knowledge Makers as a model for other communities worldwide, that same international dialogue is informing our home University and the communities it serves in other ways. A Knowledge Makers graduate student circle has been formed to scaffold success for Indigenous graduate students; the All My Relations Centre has been funded to focus on further developing Knowledge Mentors (especially faculty and elders) and Knowledge Seekers (Indigenous youth from kindergarten to grade 12); and the example of an Indigenous learning community has become foundational in the development



of a University Honours College, honouring historically underserved students by providing them with high impact, culturally aware, and research-informed learning opportunities. Ironically as seems appropriate, the internationalization of the Knowledge Makers has only strengthened our local and regional commitment, serving to locate the University in meaningful, even profound, ways as a place for “learning from the land,” on the unceded territory of Secwépemc Nation within Secwepemcul’ecw.

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Photo: Secwépemc territorial marker installed at TRU, 2014 ©TRU Newsroom

Africa



Wildebeest Migration in Serengeti National Park, Tanzania ©Daniel Rosengren

Namayani Edward

*Maasai
Tanzania
Africa*

IMPLICATIONS OF PASTORAL TRANSFORMATION FROM NOMADIC TO SEDENTARY LIVELIHOOD SYSTEMS AMONG PASTORAL INDIGENOUS (MAASAI) ON FOOD SECURITY IN THE KITETO DISTRICT

Introduction

I was born and raised in Kiteto District, Manyara Region in Tanzania back in the 1980s within the Maasai community. I am a postgraduate young professional who is passionate to work and support my community the Maasai Indigenous people. I have extensive experience in planning and climate change, coordination, community engagement, community resettlement and mobilization. For more than eight years, I have been doing different projects including land use planning, sustainable rangelands management that involved community resettlement, engagement and mobilization, and participatory rangelands management. Each of these are related to environmental conservation, gender issues, and climate change as a cross-cutting agenda in sustainable development goals.

I am very happy that after my struggle to get an education from a community where girls were not allowed to go to school, I got the chance to work back within my community. I am now working with various non-governmental organizations: as a climate change coordinator at Pastoral Women's Council (PWC); a program coordinator at Kinnapa Development Programme, and in various other positions such as a project focal person and a gender unit coordinator (Kinnapa, n.d.).

Food scarcity and variability of natural resources over time and space are among the factors influencing transformation of pastoralists. Over recent decades, climate change and variability, together with other internal and external factors such as misunderstanding of the pastoralism system of mobility by the state, are discussed as the main causes of natural resources scarcity, change and variability in many parts of Tanza

nia For the Maasai in the Kiteto district, the pastoralists have transformed and have adopted new food products like maize flour, vegetables, rice that were not traditionally used. Studies like that of McCabe et al. (1992) show the nutritional status of local Maasai, particularly of children, is declining to the point of malnutrition, and without the cultivation of products such as maize, they will not survive. The diversification of these communities from their previous livelihood has led to this study, which questions what the implications are of the transformation of Maasai from nomadic pastoralist system to sedentary on food security, specifically in the Kiteto district.

The increasing conflicts over scarce resources have mainly affected pastoralist communities. For Maasai, the major parts of our grazing land have been taken away by game reserve and national park such as the Ngorongoro National Park. Additionally, a new issue surrounding Kilimo Kwanza, an agriculture based public communications project, has emerged. It emphasizes crop cultivation, however, every household including those of the pastoralists, are required to practice crop husbandry, which significantly impacts the individual rights of our community (Kilimo Kwanza, n.d.). Despite a growing body of evidence that highlight the economic, social, and environmental benefits of mobile pastoralism, Tanzanian governments are hardly ready to tolerate mobility, and many policy makers intentionally promote the policies of sedentarization. Two Two policies in particular, the "1995 Land Policy and 1999 Land Act and Village Land Act. designate three

types of land, reserved land, village land, and general lands” (Ripkey et al., 2021). These designations codify the various types of land into a protected commodity that can be used by the government as they see fit. Specifically, the power to distribute the lands goes to the central government, under the control of the Tanzanian President. As will be discussed later, this also leaves the lands vulnerable to various factors of globalization and global pressures.

Pastoralists rely on their herds for daily subsistence. Their main diet consists of milk, meat, and blood obtained from their animals, as well as cereals, that are grown or obtained from trading their animals. Milk products account for a significant portion of the dietary energy of Maasai, Turkana, and Rendille communities. Pastoralists consume milk and milk products mainly in wet seasons, while meat (usually from goats and sheep), blood (tapped from living animals), and cereals are consumed during the dry season when milk yields diminish (Mutekanga et al., 2013; Davies & Hatfield 2007). This is why the pastoralists in the Kiteto district have adopted the new diets incorporating maize flour, vegetables, and rice, as mentioned previously. However, this move to a new diet has created the issue of changing the traditionally nomadic way of life of my people to one that is sedentary.

Pastoralism

Pastoralism is a method of livestock production in which livestock keepers move their cattle, sheep and goats from place to place to take advantage of various pasture and water sources which are available at different times during the year (Mutekanga et al., 2013, p. 216). Pastoralism can be defined in different ways depending on the type of pastoralism practiced. A socioeconomic definition of pastoralism would include those who earn their living from livestock and livestock products, for instance the Maasai pastoralist and those for whom livestock does not act as a main source of income, like the Agro-pastoralists. This lifestyle combines a dependence on livestock with social structures and traditional practices, specific beliefs and institutions, sets of laws and customs. By necessity, the definition involves a certain degree of ambiguity. In fact, this covers those who have changed from pure pastoralism due to the loss of their livestock, but who still wish to go

“Reliance on political manoeuvres to secure title to their lands and discourage immigrants, land subdivision and entitlement are among the exclusive proceeds from their land.

- Namayani Edward

back to their lifestyle of pure pastoralism, and Agro-pastoralists, who are involved in extensive livestock production, but for whom livestock is less important than cropping cultivation for household income and consumption, and finally, it also includes those whose livelihoods and cultures are shaped by livestock dependency.

Pastoralists in my district are mostly families who depend on livestock for a significant proportion of their food and income. Livestock herds are composed mainly of native breeds

and represent more than just economic assets. They are social, cultural and spiritual assets too. Livestock define and provide social identity and the security of pastoralists. They are heavily dependent on natural pastures for their diets (Tenga et al., 2008). Key livestock management strategies include herd mobility and, herd splitting and diversification by raising several species of animals in one herd and maintaining a high proportion of female livestock. Natural resources are managed through common property regimes where access to pastures and water are negotiated and dependent on reciprocal arrangements. The ability of Maasai to transfer land individually is a recent phenomenon. In traditional Maasai society, no individual “owned” grazing or water resources, all members of the oloshon (territorial section) shared land and water in each area (Olekao, 2017).

Nomadic Pastoralism

Nomadic pastoralism is a way of life and human existence that is connected with the continuous and more or less regular movements of people between different locations. The migrational movements of nomads are attributed with clearly defined routes and destinations where the nomads spend clearly defined periods of time with the ultimate goal of pursuing economic activities and ensuring their livelihood. There are three kinds of nomads: nomadic hunters and gatherers, pastoral nomads, and non-sedentary people whose economic activities focus on tinkering and trading (Britannica, 2023).

Pastoral nomadism is a very old way of life that has changed and evolved throughout time and developed a variety of genres. It is difficult to define with an overarching and all-embracing definition. Given the above, its key characteristics can be summarized by: (1) dependence on domesticated animal husbandry; (2) migration along established routes between focal grazing areas; (3) mobility of herds, people, and their habitats; and (4) the predominant economic dependence on the herds and their products. In other words, the nomadic way of life always tried to (and had to) maintain an equilibrium between the resources of the natural environment and the needs of the people. Animals and herds thus became an essential connection between humans and the environment. The word nomadic is often used

synonymously with pastoral nomadic, pastoralist, mobile pastoralism, transhumant pastoralist and extensive pastoralist (Britannica, 2020). Nomadic pastoralism has also been characterized by frequent livestock raids by neighbouring communities, or among community members themselves, and animals who are immunity grazed, and kept for subsistence meat, milk and blood (Saruni et al., 2018).

The Issue of Sedentarization of Pastoralism and Maasai People

As previously discussed, the Maasai people have been at the mercy of a government-driven move to shift from being nomadic to sedentary pastoralists. Before continuing it is important to further explain the sedentarization of pastoralists. This is a process whereby the nomadic population which had been used to moving from one place to another are forced to settle into a non-mobile community (Fratkin et al., 2004). The sedentarization of pastoralists has been growing at a rapid rate, and these communities are settling down to undertake farming activities or be closer to urban areas. Migration towards urban centres was a necessity for these pastoralists to secure their survival (Fratkin et al., 2004). The need to transform from nomadic pastoralism to settled or sedentary pastoralism has occurred in response to challenges that are man-made or anthropogenic in nature, such as the loss of land and livestock, the attraction of new opportunities in marketing and wage labour, as well as the impacts of climate change and other associated factors.

Sedentarization, driven by the demand for social amenities as well as fear of land loss, reduces mobility, productivity, disease avoidance and drought resilience. Continuous grazing around permanent settlement also lowers plant productivity and favours the spread of unpalatable herbs and shrubs. Areas remote from permanent settlements lose the patchiness and diversity of habitats resulting from mobile corrals and the nutrient hotspots they create in the savannas. Each of these factors are important considerations when discussing the occurrence of sedentarization and the cost and benefits of its application.

Finally, sedentarization also threatens the diversity and abundance of wildlife on which new economic enterprises among pastoralists are

founded. The most immediate concern over sedentarization among pastoralists is milk yield. The depletion of fuel wood and fencing materials close to settlements also adds a heavy burden on women who must travel progressively further to collect supplies (Western & Dunne 1979). A paper brief by Kirkbride and Grahn (2008) looked at the challenges of climate change to the pastoralists of East Africa and found that climate change, food security and poverty are all important factors to consider.

Changing Lifestyles and Maasai People Pastoralism Under Pressure in Tanzania

For years, the pastoral communities have been suffering the socioeconomic and socio-political effects of an encroachment onto their territories. The encroachment and privatization of their traditional pastureland for reserves and national parks, such as the Ngorongoro National Park, is one of the foremost pressing factors. However, other factors include a lack of infrastructure and poor delivery of social services, which has not improved for those already in the settlements, let alone following an influx of new residents. Hostile market mechanisms for livestock also pose significant barriers to the success of the pastoral communities, which is often condoned by the government (Tenga et al., 2008). Since the colonial period, many policies and projects have been developed to forcefully advance the transformation toward a sedentary system of life. The implementation of these various policies and projects has not been smooth or, overall, very successful, causing frustration and disillusionment for the decision-makers who are continuing to implement them- in turn, they blame the pastoralists for being too conservative and resistant to change (Anderson and Broch-Due, 2000). Decline in livestock holdings have weakened the subsistence of pastoralists over the last few decades to the point that few communities can survive on their herds (Little et al., 2001). Land loss to agriculture, parks and forests reserves, as well as immigration and land subdivision are causing land fragmentation and loss of pastoral mobility. Fragmentation and loss of mobility further raises the risk of drought among pastoral societies in several ways, including disrupting established migration pathways for livestock, access to drought reserves, and flexibility in avoiding disease outbreaks. Forced subdivision in turn results in reduction of grazing area and mobility, and fencing into units that are too

small adversely affects livestock and wildlife mobility, compounding the risks of drought in arid lands.

Pastoralists Response to the Threats of the Environmental Changes

The Maasai community responded to the environmental changes in many ways. Farming (including crop-sharing and land leases) and wage employment are the main responses to environmental threat (Southgate & Hulme 2000). Reliance on political manoeuvres to secure title to their lands and discourage immigrants, land subdivision and entitlement are among the exclusive proceeds from their land. Private land, in turn, becomes a commodity for sale or rent. Unfortunately, this works to the disadvantage of the poorer Maasai who are often persuaded to sell their lands as a result of political coercion or economic hardship (Southgate & Hulme 2000).

Food Security

The Food and Agriculture Organization of the United Nations (FAO), as cited in Kuku-Shittu et al (2009), defines food security as a situation that exists when all people, at all times, have physical, social, and economic access to sufficient and nutritious foods that meets their dietary needs and food preferences for an active and healthy life. Food insecurity in contrast reflects uncertain access to enough and appropriate foods (Kuku-Shittu et al., 2009). Food insecurity in most developing countries, Tanzania being one of them, is currently a major concern as about 783 million people living in the developing world are facing this problem (Owen, 2023). The challenge of meeting the nutritional status needs is likely to become greater in years ahead. To address the challenge, several interventions have been developed. It is becoming increasingly apparent that the solution to sustainable food security lies on interventions that involve women in a particular area (Anbacha and Kjosavik, 2019). For example, female farmers in sub-Saharan Africa account for 70 to 80 per cent of the household food production, 65 per cent in Asia, and 45 percent in Latin America (Food and Agriculture Organization of the United Nations, 1998).

To compensate for the increasing demand of quality food, lamb and milk production must be intensified under the new production systems. A possible way of transitioning toward this goal could include adopting new reproductive technologies, feeding strategies, and genotypes. An ILRI report from 2007

indicated that drought increases insecurity and famine, which eventually leads to a growing emergence of sedentarism (p. 106). This has great consequences for the feeding behaviour of livestock in a nomadic pastoral system; hence sedentarism was seen to be a viable option to improving food production, since, to some extent, it is not as dependent on seasonality as the nomadic system

is. Moreover, it allows for the cultivation of crops and production of fodders for animals. Thus, it is a system which, to some extent, brings assurance of security in terms of food availability, both for the animals and household consumers. Livestock mortalities as observed by the study did affect the nomadic lifestyle and livelihoods of nomad people to the extent that some nomads found themselves forced to opt for a sedentary form of livestock production. Among other factors, drought was

pointed as being the main cause of the mortalities. A similar pattern of findings was presented by Davies and Hatfield (2007), stating that “drought has often been put forward as the main cause of the misfortunes affecting nomadic herding, especially during low rainfall...[t] herefore, most of the livestock have been died of hunger a few months after the rainy season” (p. 14). In the past few years, the same incidence was also reported to threaten the livelihoods of a majority of nomadic pastoralists in Ethiopia, and among pastoralists in Mongolia.

Draught is not only the causative factor for the rising rate of livestock mortality. Other factors include diseases, eating poisonous plants, and drinking of contaminated water. Unlike the nomadic system, the sedentary system of animal production seems to be more

resilient to draught and diseases, perhaps because pastoralists who have settled in the more favourable agricultural environments can cultivate crops for domestic consumption and production of fodders for feeding animals. This way, the health status of the animals would remain intact, and their survival during dry season would not be at great risk. Moreover, since

in sedentary systems animals are confined within an enclosure or tethered, it is easy to control the spread of diseases. In turn this would minimize the chance of increasing mortalities.

The last important factor to discuss pertains to increasing globalization. This phenomenon represents the interconnectedness of countries in social, cultural, economic and political spheres. Although the concept itself is invisible, its manifestations through the transition of nomadic pastoralists to sedentary systems

are clearly observable. I have categorized globalization as a forceful phenomenon since it has been largely inevitable in all aspects of human endeavours, at all times, and in all ages. In line with this view, I also found that pastoralism is inherently connected to the process of globalization, directly and indirectly, and it has brought both positive and negative effects to the lifestyle of pastoralists and their livelihoods. The observations of scholars such as Toffin and Czamecka (2014) corroborate this- they assert that, “nomadic pastoralists have not been immune to the trends of globalization.” For example, the privatization process of rangeland by both domestic and international investors has intensified the scarcity of grazing land, making sedentarism seem like a more viable option for some previously nomadic producers. In addi-

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tion to that, as mentioned previously, sedentarism allows for the cultivation of crops and production of fodders for animals. Thus, it is a system which, to some extent, brings assurance of security in terms of food availability, both for the animals and household consumers.

Given the level of awareness on the benefits accrued from globalization and the driving need to increase animal production, both in terms of quality and quantity, some nomadic pastoralists willingly accepted new ideas, information, technologies, and inventions on agro-pastoralism, precipitated by the forces of globalization. Hence, they freely converted their traditional mode of production into a sedentary system. Translating that, nomads who used to keep animals by seasonal migration in search for fresh pastures and water, are now in permanent settlements with very rare movements. In their settlements, and with the help of new ideas and knowledge promoted by globalization, they can engage in cultivation of crops, production of fodders, and the selling of surplus outputs. In that way, sedentary agro-pastoralists, as compared to nomads, are in an advantageous position of ensuring food security.

There should be sound and responsive policies and strategies which must be pursued to overcome adverse effects of climate change, particularly drought, desertification, and diseases which have been affecting agricultural production and livestock keeping. For these policies and strategies to be effectively implemented, both pastoralists and agriculturalists in sedentary systems should be empowered through free information giving related to improving production capacity and product quality, and having the ability to make decisions that affect their own life. The information provided should address the following key issues: climate change coping and adaptation strategies; protection and the best utilization of natural environmental resources; appropriate agro-pastoral farming practices including animal health and veterinary vaccination; appropriate harvesting practices; and food safety management methods and techniques.

Thus, in addition to that, and with a view to increase food security and security of liveli-

hoods, it is imperative for the government and the private sector to help the Kiteto sedentary agro-pastoral farmers with the following productive inputs and resources: agricultural incentives including credits; technological tools; extra land; quality seeds; veterinary drugs, pesticides and fertilizers; agricultural insurance products; health services and education; water pipes and dams; well market infrastructures and transport systems. Lastly, I would like to recommend that sedentary agro-pastoral farmers in Kiteto district should be sufficiently flexible to take advantage of the opportunities available to them for improving production and achieving the required level of food security. have been affecting agricultural production and livestock keeping.

Conclusion

The transformation of pastoralists from nomadic to sedentary livelihood systems among the pastoralists in Kiteto district exist. Despite the fact that the Maasai people have permanently shifted to a sedentary livelihood strategy, most of them are moving seasonally with their livestock in search for pastures and water. On this basis, it may be concluded that sedentarism is not a self-sufficient mode of animal production among the Maasai people of the Kiteto district. That is why they would like to continue with exploration and utilization of available ecological niches and potentialities to satisfy their livestock and achieve a certain level of food security they desire. Apart from that, from a cultural point of view, it seems that seasonal movement has taken to be a traditional and cultural practice, which is why it is important that it be maintained.

The various factors that were responsible for pastoral transformation from a nomadic to sedentary system were internally and externally oriented, categorized into pull and push factors, which are correspondingly attractive and impulsive forces. Internally oriented factors operated at the national and household levels whereas externally oriented factors operated at the global levels. Thus, internal-pull factors were the availability and accessibility of food, water, health services, schools, markets for livestock and livestock products, roads for transport; and the interest of pure pastoralists

to engage in farming activities – crop cultivation as a supplemental livelihood strategy for improving food security. Internal and push-oriented factors were the shortage of grazing land and increasing rate of livestock mortality in the pure nomadic system of production. On the other hand, the externally oriented factor was that of globalization, which was viewed as both a pull and a push factor to a sedentary mode of production and lifestyle. As a pull factor, globalization played a significant role in stimulating and diffusing new ideas, information, technologies and inventions on agro-pastoral practices. The positive outcomes accrued from all these globalization values and practices attracted pastoralists who were pure nomads to practice sedentary agro-pastoral systems.



Coyote Brings the Food Conference - ©OKGN.Co/Beth Taylor

On the other hand, globalization played a divisive role through both domestic and multinational institutional investors, who under the government's privatization policies, acquired massive rangelands of nomadic pastoralists. Consequently, this intensified the scarcity of grazing land, hence nomadic pastoralists found themselves forced to convert their traditional mode of production to sedentary systems. Reduced grazing land due to various factors (including that played by internal and multinational institutional investors on lands, under the

auspices of globalization) was one of the reasons for the great number of sedentary pastoralists in Kiteto to remain permanent.

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KEL TAMASHEK'S ALIMENTARY RESILIENCE IN THE FACE OF CLIMATE CHANGE

Introduction

I am a Kel Tamashek person, and we are the nomadic people located within the Sahel and Sahara Desert. For centuries the Tamashek have been respected as warriors, merchants, and escorts across the harsh landscape of the Sahara Desert. We have seen our autonomy endangered by the repeated climate change induced droughts, and since our traditional way of life is centered around our food systems such as livestock herding, agriculture and gathering, this has made our existence much more difficult. Climate change has significantly altered the weather patterns in the desert, and it poses a significant risk to our way of life. Over the recent years the Sahel region, particularly from Mauritania to Chad, has experienced a heightened frequency of droughts, shortened rainy seasons, and increased temperatures (Mayans, 20202). These changes to the climate have had a profound impact on the Kel Tamashek's ability to secure food for their families and communities.

I am very happy that after my struggle to get an education from a community where girls were not allowed to go to school, I got the chance to work back within my community. I am now working with various non-governmental organizations: as a climate change coordinator at Pastoral Women's Council (PWC); a program coordinator at Kinnapa Development Programme, and in various other positions such as a project focal person and a gender unit coordinator (Kinnapa, n.d.).

Despite these obstacles, Kel Tamashek has demonstrated amazing resilience and adaptation to climate change. They have ingeniously devised a range of solutions to cope with the ever-shifting weather patterns, including innovative conservation methods. One compelling illustration of their adaptability can be found in Kel Tamashek's rich food culture (Globalbihari, 2021).



Fig 1: Kel Tamashek confederations within Africa

Source: *Asfura-Heim, 2013, Tuareg confederations [Cited 12 April 2024]. https://www.cna.org/archive/CNA_Files/pdf/dcp-2013-u-004799-final.pdf*

Notes: *The boundaries and names shown and the designations used on this map do not imply endorsement or acceptance by the United Nations.*

This cultural aspect is deeply intertwined with their social customs, and their ability to safeguard their traditional food systems holds immense significance for their identity and way of life. Their local expertise has enabled people to live and prosper in one of the harshest environments on the planet. Due to their nomadic lifestyle, Kel Tamashek is in constant motion, constantly seeking fresh pastures and water sources for their livestock.

This mobility enables them to better navigate the fluc-

tuations in weather patterns. However, it also presents a challenge when it comes to preserving their time-honored rituals and practices. The establishment of national borders and the extensive expansion of infrastructure like roads, mines, and new agricultural land, along with other developments over the past century have been significantly hampered Kel Tamashek's traditional livelihood (Alesbury, 2013).

The ongoing effects of climate change, still pose enormous challenges to their way of life. Droughts, sandstorms, floods, and the extreme unpredictability of resource availability are collectively causing severe challenges (Vyawahare, 2021). Droughts, in particular, have a detrimental impact on livestock. "Animals are everything for a Kel Tamashek. We drink their milk, we eat their meat, we use their skin, we exchange them. When the animals die, so does the Kel Tamashek" (UNFAO, 2021, p. 223). Animals cannot survive due to the lack of rainfall, thereby significantly affecting the nomadic population's food system by leading to a scarcity of essential dietary staples such as butter, milk, and meat. It is critical to support the Kel Tamashek people in their efforts to adapt and sustain their traditional food systems. In this study, we shall investigate Kel Tamashek's alimentary resistance in the context of climatic change. We'll look at their traditional food systems, adjustments to shifting weather patterns, and problems.

Climate Change Effects on Kel Tamashek

Climate change has significantly impacted the Kel Tamashek community residing in West Africa's Sahel region. In this region, temperatures are on the rise, rainfall patterns have become less predictable, and droughts are occurring with increasing frequency (Miara et al., 2022). These environmental shifts are profoundly affecting Kel Tamashek's traditional food systems, which are intricately tied to a delicate balance between animal husbandry, pastoralist practices, semi-nomadic food systems, and the gathering of wild plants and other natural resources. The escalating frequency and severity of droughts represent one of the most substantial consequences of climate change on Kel Tamashek's food systems (Alesbury, 2013). This situation has placed the food security of Kel Tamashek in jeopardy, as their livelihoods depend heavily on their livestock and crops. Sub-Saharan areas of West Africa are no strangers to drought (Goutorbe, 1997).

Between 1910 and 1915, farmers in the southern Sahel and Sudan zones experienced drought, while from 1968 to 1974, it was the nomadic pastoralists of the sub-desert and northern Sahel who were most severely affected (Kates, 1980). By the middle of 1972, tens of thousands of sub-Saharan nomads had lost their lives. Two million herders lost their livelihoods when their herds were decimated (Baxter, 1991). Several families and clans witnessed the disintegration of their social fabric. After enduring decades of colonial domination, Sahelian countries gradually made modest progress towards achieving economic independence. However, in just three short years, they found themselves once again economically dependent on other nations. Among those most severely affected by these developments were the Kel Tamashek, for whom livestock is not only a critical source of livelihood but also sustenance. During this period, Kel Tamashek communities in Niger, in particular, faced the looming threat of extinction due to these droughts (Larke Thurston, 1970). By 1968, climatic shifts had significantly depleted water resources and led to crop failures, necessitating urgent measures to address food shortages. Rising temperatures have made it increasingly difficult for certain plant species to survive in the harsh desert climate, leading to a decrease in the availability of essential resources for Kel Tamashek's traditional food systems. This, combined with the relentless encroachment of the Sahara Desert further south, constituted a catastrophic scenario (Anderson & Woodrow, 2019).

The heightened occurrence of floods and storms has become a serious problem that affects Kel Tamashek people as well. It can pose a significant threat to agriculture and animal husbandry (Indigenous Climate Hub, 2020). This can result in crop damage, infrastructure destruction, and substantial cattle losses. Additionally, they can complicate access to crucial resources such as water and wild vegetation, exacerbating the challenges faced by the community. In September 2023, over 5,000 individuals are believed to have lost their lives, and around 10,000 remain unaccounted for following the collapse of two dams in northeastern Libya due to intense rainfall caused by Storm Danie. This disas-

trous climate event appears to be on track to become one of the deadliest ever recorded in North Africa. The floods have impacted numerous cities, encompassing Al-Bayda, Al-Marj, Tobruk, Takenis, Al-Bayada, and Battah, stretching along the eastern coast to Benghazi (Alkhshali et al., 2023)

Climate change is also profoundly reshaping the social and cultural fabric of the Kel Tamashek community. As Vyawahare (2021) points out, people are adapting their way of life due to climatic shifts, environmental degradation, and political instability. This transformation is particularly evident in the evolution of traditional nomadism. In contemporary times, seasonal migrations are primarily led by men, while women and elders establish more stable settlements, enabling them to participate in agricultural activities. The decline of traditional food systems is prompting a growing number of young people to seek better economic opportunities in urban areas. This demographic shift is causing a significant loss of cultural identity and heritage, as well as the erosion of traditional knowledge and customs.

How does Kel Tamashek Face Climate Change?

The Kel Tamashek people, like other Indigenous communities across the world, are making huge strides to ensure that their unique culture and homelands will be preserved for future generations (Steeves, 2018). The Kel Tamashek people have a firmly established environmental ethic that is reflected in their way of life and exhibits a profound, generations-long familiarity with their natural surroundings (UNFAO, 2022). The Kel Tamashek people's ability to manage herds of grazing and browsing animals in resource-poor regions depends on their extensive understanding of land stewardship practices that ensure the survival of fodder supplies, such as native trees and grasses (McNaughton, 1984). Despite the fact that many Kel Tamashek have adopted sedentary or semi-sedentary pastoral lives due in part to the increased frequency of drought occurrences (Snorek, 2016), nomadic pastoralism is still an integral aspect of Tuareg cultural identity and way of life (Snorek et al., 2014).

Changes in agricultural practices are one of the keyways the Kel Tamashek have adapted to climate change. They have been experimenting with

new crop varieties, such as drought-tolerant (DT) maize, which is more resistant to drought and capable of withstanding harsh temperatures (Lunduka et al., 2017), as well as drought-tolerant millet and sorghum to cope with the increasingly frequent droughts in the community. Another important aspect of the adaptation strategy is the implementation of soil management and conservation techniques, including practices like composting and crop rotation. These techniques help to preserve moisture in the soil and enhance soil fertility.

In addition to changes in agricultural practices, the Kel Tamashek have been responding to climate change by strengthening their water management systems. This involves the installation of water storage systems, the digging of wells, and the use of drip irrigation systems, which allow for more effective water use (Vyawahare, 2021). They have also used traditional water conservation practices, such as erecting stone walls, to decrease erosion and preserve water in the land. These water management strategies serve to guarantee that the Kel Tamashek have access to water during times of drought, which is crucial for the survival of their cattle and crops (Vyawahare, 2021).

The Kel Tamashek have also been adapting their traditional knowledge and practices to deal with the effects of climate change. They have a deep understanding of the desert environment and have developed sophisticated techniques for conserving water, managing livestock and crops, and dealing with extreme weather events. They have been handing in this information from generation to generation, ensuring that it is not lost over time. Furthermore, the Kel Tamashek have a strong cultural identity and sense of community, that will lead the people who live in the community to have a strong sense of keeping the traditional way of living. No one owns the land among the Kel Tamashek but groups that rely on each other understand the traditional rules for using water and grazing areas. Mali has enacted national legislation that upholds their rights to these vital resources and acknowledges their responsibility for environmental conservation. This strong sense of community can help Kel Tamashek people cope with the problems of climate change and other environmental hazards.

Agriculture

The Kel Tamashek relies on livestock herding, agriculture, and gathering to sustain their families and communities. Agriculture plays a crucial role in their traditional food systems, offering essential nutrition and income for

their families and communities. Kel Tamashek people are skilled farmers. They are using sophisticated irrigation techniques to cultivate a variety of crops in small oases and river valleys. One of the most important crops in the community is dates. Dates play a significant role in the lives of the Kel Tamashek people. Date palms are a staple crop in the Sahel region, and the Kel Tamashek have a long history of cultivating and trading them. Date palms are highly valued for their nutritional content and are used in a variety of traditional dishes and beverages. The Kel Tamashek cultivates date palms using a complex system of irrigation channels, which allows them to maximize their yields despite the arid and unpredictable desert environment. They carefully monitor water levels and use a variety of techniques, such as terracing and mulching, to conserve soil moisture and promote healthy plant growth.

Kel Tamashek also grows a variety of other crops, including wheat, barley, millet, and sorghum (Globalbihari, 2021). These crops are typically grown in small plots in river valleys or around oases and are irrigated using a combination of flood irrigation and furrow irrigation. The Kel Tamashek uses animal manure to enrich the soil and promote healthy plant growth, and they carefully monitor their crops to ensure that they are healthy and free from pests and diseases. Livestock also played an important role in the Kel Tamashek's agricultural system, as they provide a source of fertilizer and labor for planting and harvesting crops (Globalbihari, 2021). Camels, in particular, are highly valued for their ability to transport water and other goods across the desert and are often used to transport crops from the fields to market.

In addition, Kel Tamashek people have also developed a sophisticated system of water management that allows them to conserve and distribute scarce water resources (Globalbihari, 2021). They have a deep understanding of the local hydrology and carefully monitor rainfall patterns and water levels in rivers and oases. They have developed a variety of techniques for capturing and storing water to use in agricultural activities, including building stone dams,

and digging wells. They also use a system of channels and ditches to distribute water to their fields, carefully managing the flow of water to ensure that each plot receives the right amount of moisture.

Overall, Kel Tamashek's agricultural system is highly adaptive to the arid and unpredictable desert environment, reflecting a deep knowledge of the local ecology and a sophisticated understanding of water resources. Their system of irrigation and water management is sustainable and efficient, allowing them to grow a variety of crops despite the challenging conditions. Kel Tamashek's agricultural practices have evolved over centuries of living in the desert and represent a unique and valuable form of traditional knowledge that is well-suited to the challenges of climate change and other environmental pressures.

“Animals are everything for Kel Tamashek. We drink their milk, we eat their meat, we use their skin, and we exchange them. When the animals die, so does Kel Tamashek.”

- Ghasala Mohamed

Animal Husbandry

“Animals are everything for Kel Tamashek. We drink their milk, we eat their meat, we use their skin, and we exchange them. When the animals die, so does Kel Tamashek.” (UN-FAO, 2021, p. 223). This saying is what identifies how important animal husbandry is as the main source of food for Kel Tamashek. The Kel Tamashek's traditional food systems depend heavily on animal husbandry since it gives them access to the meat, milk, and other animal products they need for their diet and way of

life. The Kel Tamashek are expert livestock herders that raise a range of animals in the harsh and arid desert climate, including camels, goats, sheep, and cattle.

The camel is among the most significant animals in Kel Tamashek's animal husbandry system (Christian, 2015). Because of their propensity to endure inhospitable desert environments and to transport heavy loads over great distances, camels are valuable. They are also Kel Tamashek's main source of milk. Camels are carefully handled and watched over by their owners as they are grown in vast herds. The Kel Tamashek are expert breeders, trainers, and caregivers of these significant creatures with an in-depth understanding of camel biology and behavior. The Kel Tamashek also breeds goats, sheep, and cattle in addition to camels. These animals are usually grown in smaller herds and primarily used for the production of meat and milk. This is Kel Tamashek's primary diet. Due to the harsh climate, they have created a technique that involves drying thin meat pieces in order to aid in preservation. In addition to preserving the meat for a long time, this also enables the meat to maintain its vitamins. An example of this is Cow butter, known as "OUDI" in Tamashek, is another nutritious product that is also produced; it is butter that has been removed from milk and prepared in a way that allows it to be preserved for years.

Kel Tamashek has created a drought-resistant cheese variety called "Tikamaren" that is hardy in nature. In order to preserve the cheese for a long time, it is prepared from cow's milk and dried. The ingredients for producing cheese are put in a wooden bowl and come from a young goat that may have been killed especially for the purpose of making cheese. The abomasum is the last sac of a ruminant's stomach. After the milk has fermented, the mixture is pushed through a wooden press built by neighborhood women. Pressure is the technique used to separate the milk from the cheese curd. They then utilize animal-skin-covered utensils to keep their goods fresh for days or even years. An example of a dish that is mainly made from animal products and is also gathered is tidah . It is a creamy mixture crafted from millet and dehydrated cheese to address the reduced food availability when animals, such as livestock, are not producing milk during a particular season. The preparation of this cream involves blending millet, traditional Tuareg cheese, dates, and a variety of spices, with the specific spice choices influenced by the community's preferences (Slow Food Foundation, 2021). It is well

known to be very nutrient-dense, and it is served to kids in order to supplement their diets. It is prepared from cow's milk that has been preserved so that it can be converted into yoghurt. Furthermore, "Isilay " is combined with flour in Tamashek. "Tidah" is highly effective in droughts to keep kids from being dehydrated.

Overall, the Kel Tamashek's animal husbandry system is highly adaptive to the arid and challenging desert environment, reflecting a deep knowledge of animal behavior and biology, as well as a sophisticated understanding of local ecology and water resources. Their system of animal management is sustainable and efficient, allowing them to raise healthy and productive herds despite the challenging conditions. Kel Tamashek's animal husbandry practices have evolved over centuries of living in the desert and represent a unique and valuable form of traditional knowledge that is well-suited to the challenges of climate change and other environmental pressures.

Gathering

One of the Kel Tamashek's traditional ways of getting food is to gather a lot of wild plants and other natural resources , such as cereal and vegetable farming (UNFAO, 2021). The capacity to recognize and make use of a variety of plants and other resources is essential for survival in the arid desert environment, where water and other resources are limited.

The local ecosystem and plants that thrive there are well known to the Kel Tamashek. The ability to recognize and gather a variety of wild plants, including fruits, berries, nuts, and seeds, is one of their strengths. They eat a variety of natural plants, but tamarind, dates, acacia, and baobab are among the most crucial. With the plants they harvest, Kel Tamashek has amassed a wealth of expertise in medical therapy. Gum Arabic, or *Acacia nilotica*, has been demonstrated to lower blood sugar levels and is used in antibiotics. Jujube and desert date plants are also used to treat diabetes and high blood pressure. Moreover, grinding up the desert date tree and burning the resulting ash can be used to heal boils and open wounds (Lebel et al., 2009).

The Kel Tamashek has a variety of methods for collecting and using natural plants. They gather fruits and nuts from trees and shrubs using specialized equipment and methods, such as shaking the branch-

wild beehives because it is so crucial to their diet.

Overall, Kel Tamashek's ways of gathering show that they had a deep understanding of the local ecosystem and the resources that could be found in the desert. Their ability to find and use different wild plants and other resources is important to their survival and shows that they have a strong connection with the environment. Also, they can use resources without hurting or depleting the environment because of how well and sustainably they gather them. As a result, the collection methods used by the Kel Tamashek represent a distinctive and priceless kind of traditional knowledge that is ideally suited to the difficulties posed by climate change and other environmental constraints.

In conclusion, the alimentary resilience of the Kel Tamashek in the face of climate change is a testament to their ingenuity, adaptability, and deep knowledge of the local environment. Their traditional food systems and gathering practices reflect a sophisticated understanding of the local ecology and resources, and their innovative agricultural and water management techniques enable them to cope with the harsh desert environment. Despite the increasing frequency and severity of droughts and extreme weather events, the Kel Tamashek are adapting and maintaining their traditional food systems, relying on their deep knowledge of the local environment, their sophisticated agricultural practices, and their innovative water management techniques. The Kel Tamashek's ability to maintain their traditional food systems and their cultural identity in the face of climate change is a testament to their resilience and commitment to their way of life



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Arctic



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Christine Olsen
 Sámi
 Sweden
 Arctic

IT'S TIME TO PUT THE POWER OF PLANTS BACK INTO PEOPLE'S HANDS

"It is in my blood; the wisdom passed down from my foremothers. What I experience as gut feeling and intuition are their voices guiding me. I feel the calling to put the power of plants back into people's hands. I also feel the call to assure that every woman knows her body and how to honor and follow her inner rhythm. We are the wisdom keepers. We are the foundation for coming generations. We are the weavers of a sustainable future."

Imagine that every food store and pharmacy where you live shuts down today. No one knows when or if they will open again.

How do you assure that you get the nourishment and medicine your body needs to stay strong and healthy? "During the global COVID-19 pandemic, I was reminded of the importance of knowing what plants I can go out and eat and use as medicine outside my door. I want to make sure that every child, from an early age, learns about the plants around them that can be used as food and medicine. And I want to see Sámi culture, as well as other indigenous cultures around the world, get the support we need to survive and thrive."

Bures. Mu namma lea Risten Olsen ja mun orun Staares, Ru#as Sápmi. Mun lean Sámi nisson, eadni ja čalbmeeadni, Hi. My name is Christine Olsen and I live in Ostersund, Sweden, Sápmi, I am a Sámi woman, mother and eyemother.

Eyemother, "she who sees" is a term that has its roots in Sápmi, for traditional midwives and medicine women. A woman who could look into the souls of birthing women and hold space for her. She is a guide into the unknown, in both birth as well as death. A priestess of transformations of the soul (Hansen, 2010).

I am also the president of Niejda (which means daughter/girl in Sámi language), an organization to empower woman, girls and non-binary people in Sápmi. We have a project called Vuolleváibmu (pronounced volle-vaimo) which aims to empower Sámi women as well as revive and preserve traditional Sámi knowledge about women's health- that is threatened to be forgotten when our elders pass away. This includes the knowledge of plants as well as the moon phases, since women, the moon and plants always have been deeply interconnected. Vuolleváibmu means "lower heart" in Sámi and refers to the reproductive female organs. I think it is both powerful and beautiful to think of the uterus as our lower heart, as it, just like our upper heart, is a hollow, smooth

musculature. She is also the first home for our children. Of course, she is speaking to us, just like our upper heart, if we are willing to listen.

In this paper I want to illuminate why it is of importance to put the power of plants, the moon and traditional Sámi knowledge of women's health back into people's hands, and how we can do it.

Sámi and Sápmi

My people, Sámi people, are the Indigenous people of Europe, and our land, Sápmi, is reaching across four countries: the northern part of Norway, Sweden, Finland, and the Kola Peninsula of Russia. We have lived here, in this arctic climate, for over 10 000 years (Ponga et al., 2020). During colonization we were Christianized, forced to move from our traditional land, exposed to double taxes and hard assimilation (Hansen, 2010). Despite this, we have kept our culture alive. Sámi people's connection with Sápmi and our culture is today being threatened through several mechanisms including exploitation of land (often described as a green energy shift), and bans on reindeer herding (Partapuoli, 2023). Our traditional lands are being destroyed by mining, forestry, wind- and watercraft and Sámi women are deeply engaged in protecting them (Knoblock, 2022). With the

destruction of the land, our culture is threatened since we are living in close connection with nature. Our access to food and medicine from our surroundings also diminishes.

Significantly, we have been positioned in social consciousness as being primitive for eating mostly things that comes from our surroundings. Sámi were historically not allowed to be reindeer herders and to grow our own food simultaneously, we were forced to choose between them (Olsen-Nikkinen, personal communication, 2023). Since the conditions for reindeer herding got harder and harder with the exploitation of our land, it was easier to grow food. Then the grocery stores became more available, with food that is often imported and processed, and we started to forget how to use what grows naturally around us. As a result of these different drivers many of our children don't know what they can eat or use as medicine from what grows around them in the wild. I believe that this should be a basic knowledge, learned both by our elders as well as in school. In our Sámi society, we traditionally eat a lot from the wild, fish, meat, herbs, and berries. The knowledge of herbs that we can eat and use as medicine is partly still alive, even though colonization has forced us to move from our traditional areas and banned us from using plants as medicine.

The Sámi Food Culture

The food culture of Sámi people is not simply about preserving dietary choices, but rather about preserving a lifestyle and culture deeply integrated with traditional sustenance. Since the Sámi food culture is based on the plants and animals in the area where we live, preserving it is deeply connected to bringing the power of plants back into people's hands. As Sápmi is a huge landmass, food culture differs depending on where we live- up in the mountains or close to the sea. What we have in common is that we have always been hunters and gatherers (Huuva, 2014). In the harsh Arctic and sub-Arctic environment, strategies for year-round food sovereignty have been, and continues to be, necessary. These include strategies for gathering, fishing, hunting, herding, cultivating, sharing, and trading as well as strategies for preparing food by slaughtering, cleaning, preserving, storing, cooking, and serving.

When you taste the Sámi food, you are tasting many thousand years old food traditions. The fat from reindeer is like culinary gold with its high nutritional

content and rich taste. The fat gets its good characteristic by the reindeer eating grass, herbs, reindeer moss, crowberries, and other wild plants. In the Sámi kitchen the fat is used in different ways and is a central component of our diet (Harnesk, 2014). Meat from reindeer contains much more vitamin B12 than meat from cow and pig. According to a study, 67 gram of reindeer meat contains as much vitamin B12 as 167 grams of beef or 280 grams of pork (Nilsson, 2012). This nutrient dense food is essential to survival in this Arctic region and is extremely lean with beneficial fatty acids which is unlike farmed animal meat.

I want to share some plants that are traditionally used in Sámi culture. Many of these plants are not only edible and utilized for nutrition but are also used for medicine and well-being. Birch, rowan, lingonberry, blueberries, cloudberries, juniper, wild angelica, Lapland mountain sorrel, alpine lettuce, horsetail, yarrow, meadow sweet, rose bay, roseroot, stinging nettle, lady's mantle, wild rosemary, holy grass, and plantain (Ponga et al., 2020).

I remember my mother, who used resin as tooth gum, and taught us to do the same. I now read in the book *Food and medicine* (Ponga et al., 2020) that chewing resin prevents cavities, infections and periodontoclasia, loosening of the teeth. It also whitens the teeth. This is an example of how we instinctively used things from nature, that later has been proven to be good for your health. A significant amount of traditional healthy food has been replaced with imported food, with a very easy to spot example being how coffee has taken over our traditional use of chaga from birch. We also use cacao instead of sun dry and grind the thin membrane between bark and wood from different trees (Kaspersen, 1997).

Reclaiming Our Practice: Árran, Women and Children: The Power of Indigenous Women and the Fireplace

Árran- the fireplace. The fireplace is central and holy in Sámi culture. It's the home of goddess Sáráhkka¹ (The goddess that protects pregnant and birthing women), it gives us warmth and makes it possible to cook food. It also keeps insects and wild animals away.

¹ Sáráhkka is one of our primal mother Máttaráhkka's three daughters. She is the Sami goddess of childbirth. She lives under and protects the fireplace, árran.

To show respect for Sáráhká, it is custom to put the final drops of your coffee or tea onto the side of the hearth (Huuva, 2014). Árran is also a place to gather around to tell and listen to stories, to keep traditional knowledge alive. We in Niejda this year (2023) received funding for a small project, that we call Handicraft and stories around the fire, which is a part of our bigger project Vuolleváibmu. We are a group of Sámi women from different generations that gather around the fire eight times during a year, according to our eight seasons. We do this to remember and rejuvenate our culture and our power as women and creators of new life. To cocreate a world where our coming generations will thrive.

I would like to share my own experience engaging with traditional foods that supported me through my pregnancy and then through childbirth to illustrate how many of our traditions have been replaced with empty imported foods. When I was pregnant with my third child, I felt a strong longing to eat Sáráhkás porridge, a porridge made of herbs- that in Sámi culture traditionally was given to the woman after giving birth (Spik, 2017). Unfortunately, I could not remember all the ingredients for Sáráhkás porridge that had been given to me by Laila Spik, a wise Sami woman and author, many years ago. I tried to reach Laila, and when I could not reach her, I asked many of the wise Sámi women and men that I know- about the ingredients. Most knew the name of the porridge, but none of them knew the herbs in it. They asked people in their turn that might know, but there was no success. I have

read about it in books as well, but nowhere are the ingredients named. This is when I realized we must take back the power of the plants and put it back into people's hands. I believe that the Sáráhkás porridge is much more nourishing to the newborn mother, than the sandwich and soda that is given to the newborn mother in our hospitals in Sweden. As I gave birth at home, I followed my gut feeling and asked my best

friend Anette to come and make me a warm soup made of vegetables from our garden and bone broth from our chickens. It was the most delicious meal I have eaten in my whole life. She also brought me cloudberry, my favorite berries. One of them I put on my birth altar, to thank Sáráhká for her support. For the first days after birth, I also drank nettle infusion, which was nurturing me on a deep physical and spiritual level.

I want every human being to have access to wild nature and to know what to eat and use as medicine. When we eat the food that grows around us in the wild, it turns out that this food is our medicine, especially if we pick the different part of the plant during certain phases of the moon. Good food is also preventive medicine, that keeps us and our culture strong and healthy.

Another thing that I mentioned in the beginning of this discussion is the importance of a woman's ability to know and follow her menstrual cycle and/or the moon cycle. This can increase our wellbeing and resilience. Our menstrual cycle is a wise guide of when to be more active and

“As a result of these different drivers many of our children don't know what they can eat or use as medicine from what grows around them in the wild. I believe that this should be a basic knowledge, learned both by our elders as well as in school.”

- Christine Olsen

outgoing and when to slow down and listen inwards. It is also recognized as our fifth vital sign (together with body temperature, pulse rate, respiration rate and blood pressure), that reflects our state of health (American College of Obstetricians and Gynecologists, 2015). But we have adapted to a linear system in a patriarchal society and have not been encouraged to follow our cyclical nature for a very long time. A survey that Niejda and the Norwegian organization Sámi nisson forum (Sámi women's forum) did together in 2022 showed that Sámi women in different ages want to learn more about hormonal health and how to prevent menstrual and post-menstrual problems.

Hand in hand with taking back the power of plants and our bodies is to take back the knowledge about how we are affected by the moon. The gravitational pull of the moon affects everything that contains water, not only the ebb and flow of the sea. And the light of the moon also affects our hormonal levels. Before electricity, women around the world often bled during the new moon and ovulated during the full moon. It is not only in the Sámi society where women gathered in tents during menstruation, as we were more powerful and in deeper contact with ourselves and creation during this time. We used to use different herbs for women's health, from menarche to menopause, and we picked different parts of the plants during the different phases of the moon. I am dedicated to taking this knowledge back before it disappears.

What Can Be Done?

With this article, I hope that it is easier to understand why it is of greatest importance to take care of and pass down the traditional knowledge from our elders to our younger generations as well as strengthen Sámi women and culture.

We, the Sámi women and Indigenous women around the world, have since time immemorial used plants as food and medicine and we have always been

in a close relationship with the phases of the moon. We have a big responsibility and job. We often work, take care of home and children and at the same time we are tradition bearers fighting for our land, our culture, and

future generations. I would like to see further research on Sámi women's health as well as traditional knowledge being prioritized.

Even though we have had, and still have, a difficult time keeping our culture alive in the face of outside forces, I see a future where my grand grandchildren and children around the world are able to go outside their home and pick plants as food and medicine. It is natural to them. They know how to pick the plants in a sustainable way

and how to use them. They also know how to hunt and use all the parts of the animals that they were gifted with as well as living in harmony with their hormones, the land and following the phases of the moon as well as the eight seasons in Sápmi.

I also think it is important to educate people and take care of the traditional Sámi knowledge. Beginning in preschool, children should learn about the Indigenous people of Europe, plants that grows around them, the moon, and the seasons in nature as well as about our bodies. Things that we Sámi people can do already today to strengthen our connection to nature and our culture are for example to bring the sacred fire back into our lives. To bring the circular thinking and buildings back. To go out and sit with the plants that grows around you. Listen to them and start/continue to use them as food and medicine. Gather different generations around the fire to tell and listen to stories. Ask the elders around you what knowledge they have. Write it down and make sure to pass it future generations.

We, Sámi people, can, if Sápmi from now on get to be a secured zone where exploitation of our land is stopped, show a way to a sustainable future for generations to come. If wilderness with rich biodiversity

“When you taste the Sámi food, you are tasting many thousand years old food traditions.”

- Christine Olsen

is protected and revitalized around the world, if we reduce our energy need, if women are empowered to follow their cyclic rhythm and if people get and learn how to use what grows around where they live, we have created a world where our future generations can live and thrive. A world where the power of plants is in every human's hands.

Acknowledgements

I want to say Ollu giitu, great thanks, to my ancestors, mu máddárat, for keeping the knowledge of living in a sustainable way in an arctic climate alive for thousands of years, through times of colonization and Christianization. I can hear your voices, guiding me back to the food and medicine that surrounds me. Ollu giitu to my beloved children, mu mánaid; Hillevi, Abbe and Idun Minna, for being my best teachers. Ollu giitu to our primal mother, Máttaráhkka, for your abundance and patience. Ollu giitu to Knowledge makers, for believing in me and supporting me to raise my voice. And finally, ollu giitu to the plants and animals around me, that I am a part of and that is a part of me.

This article is a love letter to all the above as well as to future generations. It is also a call for support to help us preserve traditional knowledge about women's health and plants, to create the change we want to see in this world. The time is now.

In deep reverence, gratitude, and faith,
Christine/Risten

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Coyote Brings the Food Conference - ©OKGN.Co/Beth Taylor

Christine Olsen

Sámi
Sweden
Arctic

REINDEER SOUP WITH KLIMP

This is a soup that my mátteráhkka, my great grandmother, often did. I love it!

Ingredients

1 kilo reindeer meat (preferably brisket or meat with bones). You can use other meet if you want.
200 gram potatoes
200 gram carrot
100 gram rutabaga
100 gram parsnip
Salt
A little bit of apple cider vinegar if you want

Klimp:

2 egg (can be left out)
2 deciliter flour
1 dl milk
Salt

You can also add blood if you have access to that



Christine Olsen - ©Photo Christine Olsen

Process

Chop the meat in the size you prefer. Put it in a big casserole and add 1-2 teaspoons of salt per liter water. Simmer for 1-2 hours and if there is foam, take it away. I add some apple cider vinegar to get as much collagen out of the bones as possible, but my great grandmother did not do this.

Chop the vegetables in the size you prefer and put down carrot and rutabaga to boil for 5 minutes. Then add the potatoes and boil for about 10 more minutes. During this time, mix the ingredients for the klimp. Some prefer to do it with eggs, and some without. The same thing with blood. The important thing is to get the consistence of porridge.

Take two spoons and put down a little bit of the “porridge” in the simmering broth. When it floats up to the surface, take it out and put on the side.

Serve the soup together with the klimp. Decorate with nettles if you want, fresh or dried.

Enjoy this warm and nourishing meal!

Ilana Zakharova

*Evens
Russia
Arctic (Yakutia)*

REINDEER HERDING: KEEPING THE EVEN CULTURE ALIVE AND CONTRIBUTING TO FOOD SECURITY

"I believe that we should not simply accept the loss of reindeer herding and its associated traditional knowledge, considering the huge benefits it can potentially provide. Reindeer herding can bring a lot to the table, not only food but also knowledge."

I represent the Even people, an Indigenous ethnic group from Siberia and the Far East of Russia. I was born into a family of reindeer herders, so it allowed me to grow up closely connected to my culture and be able to speak my mother tongue. This is not common among Indigenous people in Russia, due to the cultural assimilation policies implemented by the Soviet government during the period known as Sovietization. The primary objective of this policy was to transform traditional societies within the USSR territory into a more uniform, Soviet-style society (Bartels and Bartels, 2006; Toulouze, Vallikivi & Leete, 2017).

During my early childhood, I spent a lot of time with my grandparents and cousins in the wilderness, constantly moving from one place to another to oversee our reindeer herd, and only returning to the village for wintertime. Later on, after I went to school, my parents decided to fully devote themselves to reindeer herding, so even after starting school and university, I would still often visit our herd, though for a significantly shorter period of time. As you can tell from my background, I have quite a strong connection to my culture and traditions, and I deeply care about its current state and future. I always knew that my career would be somehow related to advocating for Indigenous peoples' rights and interests, but now that I am pursuing education in a foreign country, I feel like I got caught up in other areas and deviated from my initial plans. I've realized that it is time to go back to my roots and start implementing all the knowledge (not only academic) that I have accumulated over the years to finally start doing something

that, one day, will hopefully bring positive change to my community.

When I came across the Special Edition of Knowledge Makers in collaboration with the United Nations Food and Agriculture Organization (FAO), I saw it as a perfect opportunity to embark on my long-awaited journey. By making our voices heard on such a global platform, I hope to raise awareness among individuals, organizations, and policymakers about the crucial role of Indigenous traditional practices in addressing food security challenges in a sustainable manner.

Without hesitation, in my paper, I decided to discuss the importance of preserving the traditional livelihood practices of the Arctic Indigenous people in Russia as (1) an essential part of our language, culture, and identity, and (2) a possible sustainable solution to food insecurity, ubiquitously experienced by communities living in the remote settlements of the Russian Arctic. In addition to food insecurity, I also bring up other persistent issues prevalent in the Russian Arctic region, such as poor transport connectivity and remoteness. I examine all these issues through the lens of my community, the Even people inhabiting the village known as Sebyan-Kyuel (Republic of Sakha Yakutia). While doing so, I inevitably touch upon other widespread problems faced by Indigenous communities all over the world, which include environmental changes and the exploitation of Indigenous lands for mining purposes.

When presenting my arguments, I combine scientific evidence and my personal experience to be as compelling as possible. The latter, however, prevails, as this

subject is very dear to my heart, so I acknowledge that I, probably, tend to over-romanticize our traditional way of life because I feel homesick or just like many people, feel nostalgic for my childhood. However, there is more to that. In fact, as someone who experienced it firsthand and whose family members are still actively involved in reindeer herding, I am very aware of how hard and demanding this lifestyle can be. Yet, even being fully aware of all the hardships, I still strongly advocate for maintaining our traditional practices, and in this paper, I attempt to articulate my stance on that in more detail.

Background

The Even people, Their History, and Current Status

The Even people (also known as Lamut people) are one of the Indigenous peoples in Russia. Numbering about 20,000 people (Federal State Statistics Services, 2023), they live across Siberia and the Russian Far East. Most of the Evens (about 70%) live in the Republic of Sakha (Yakutia), the largest region in Russia in terms of size, which is also known to be the coldest inhabitant region of the world. Yakutia is home to many other Indigenous ethnic groups, such as the Sakha people (which constitute the majority), Evenki, Yukaghirs, Chukchi, Dolgans, etc. (Federal State Statistics Services, 2023).

Historically, the traditional economy of the Evens was based on reindeer herding, hunting, and fishing. Those inhabiting mountainous areas were predominantly reindeer herders and lived a nomadic lifestyle, while those living on coastlines represented a semi-settled group of Evens who were mainly involved in fishing and hunting sea mammals (Alekseeva, 2019). Naturally, hunting was also essential to the Even people's life. This not only provided them a significant amount of food but also, at some point in history, allowed them to pay the so-called *yasak*, fur tribute collected from the Indigenous people of Siberia by the Russian Empire (Willerslev and Ulturgasheva, 2006).

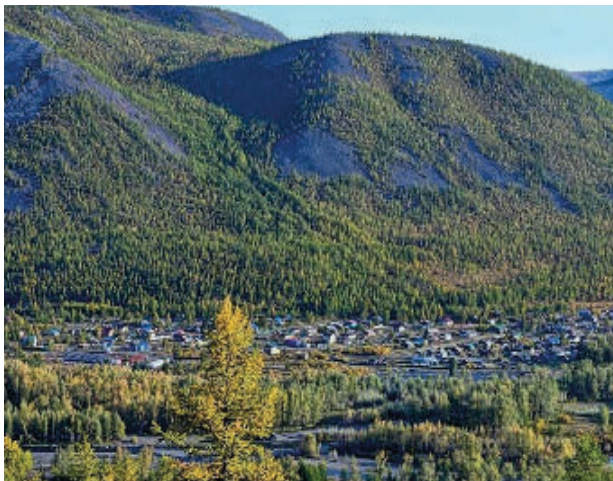
During the Soviet time, most of the Arctic Indigenous nomadic people, including the Evens, were forced to settled down. However, hunting and reindeer herding were still around and would even receive support from the Soviet government, as they could produce tangible value, i.e., meat or fur, and thus be of higher economic value. The government's primary focus

was on supporting reindeer husbandry, as it was deemed more economically viable compared to other traditional activities. In order to ensure the profitability of reindeer herding, the government implemented high procurement prices for reindeer meat (Vinogradova, 2010). Moreover, reindeer herding communities received significant financial assistance, along with the provision of essential machinery and tools such as all-terrain vehicles, motor vehicles, and radios. This support played a crucial role in the growth of the domestic reindeer population, which reached its peak of 2.4 million by the early 1970s (Klokov, 2006).

That's why there is a common perception among Indigenous communities of the Russian Arctic that thanks to such support, they used to take pride in their work and see themselves as contributing members of the Soviet society. This is not to say that the Soviet officials supported our traditional practices because they genuinely cared about their cultural implications. On the contrary, I feel like it is more correct to say that they decided to turn a blind eye to the fact that the nomadic lifestyle does not fit into their vision of the "right" way of living, as they recognized the importance of traditional knowledge for the better economic performance of these activities. For instance, a 1956 publication by the Soviet Academy of Sciences (Bartels & Bartels, 1956) recognized the Indigenous people of Siberia for their extensive experience living in the harsh Northern climate, exceptional hunting and reindeer breeding skills, and profound understanding of the local environment. The authors (Bartels & Bartels, 1956) suggested that by thoroughly studying their unique qualities, "the treasures of Soviet socialist culture" (p. 268) could be more quickly shared with the Siberian population. This, in turn, was expected to facilitate the efficient utilization of Siberia's abundant resources for the overall development of the entire Soviet state. Either way, I think it's only fair to say that by virtue of stimulating these activities, even if they had an ulterior motive, they unintentionally helped the Evens and other Indigenous peoples to conserve traditional knowledge systems that otherwise would have been lost.

However, such a paternalistic approach didn't come without adverse consequences. With the collapse of the USSR, after being constantly supervised by the government, the Even people and other Indigenous communities couldn't adapt to the new economic and political reality, and their traditional livelihood practices rapidly fell into decline in the 1990s. As a result of the liquidation of state-supported collective farms and agricultural enter-

prises in the 1990s, thousands of reindeer herders, fishermen, and hunters lost their jobs. This period was marked by poverty and high levels of unemployment among the indigenous population, with their nominal incomes being much lower than the national average, and the cost of living in the North being higher than in other regions of Russia (Vinogradova, 2010). Approximately half of the working-age Indigenous population struggled to find stable jobs (Zaidfudim et al., 2003).



Sebyan-Kyuel village in summer. Photo © Zinaida Potapova, Even photographer from Sebyan-Kyuel

Reindeer herding, particularly, faced a severe crisis during the reform years due to the loss of state support. For instance, the total number of domestic reindeer in Russia by the early 2000s had decreased to half of the maximum number reached in the late 1960s (over 2.4 million). Some Indigenous groups such as the Nganasans, Negidals, Kets, and Karelians had lost their traditional reindeer herding practices entirely (Vinogradova, 2010). The Orok people also saw a decline in reindeer herding activities, and the efficiency of reindeer farms dropped significantly, resulting in a fivefold decrease in reindeer meat production compared to previous levels.

In that time, despite various policies and programs being put into place, Indigenous people involved in traditional activities had a difficult time getting by. Nowadays, the challenges they face are accompanied and exacerbated by climate change and mining companies' activities that limit access to their lands and cause environmental disruptions.

In the following chapters, I will try to put a human face on these and other issues by telling the story of my home village, Sebyan-Kyuel.

The Reality of Life for Russian Arctic

Indigenous Communities: Insights From Sebyan-Kyuel: A Small Even Community From Yakutia

Overview

Sebyan-Kyuel is a small settlement of the Even people, located in the Republic of Sakha (Yakutia). According to the most recent Russian Census done in 2021 (Federal States Statistics Services, 2023), Sebyan's population reached 774 people. The community is sometimes referred to as the Lamynkha tribe of the Even people. For the sake of convenience, from now on, I will use a short version of the village's name that is Sebyan.



Tank trucks on their way to Sebyan.

Photo © Zinaida Potapova

Located in a mountainous area, Sebyan is extremely difficult to access, even though it is located only 362 km away from the capital city Yakutsk, which is considered to be relatively close in the context of the geographically large Yakutia. So, when using the word "remoteness" in the Sebyan's case, people mean its poor transport connectivity to the rest of Yakutia, rather than its distance.

The village doesn't have road linkage to the rest of the region. There are only ice roads during winter, which are highly dangerous and unreliable due to harsh climate conditions. Now, with climate change, they are getting even more unpredictable every year. Generally, there is a trend of the accessibility period becoming shorter. For example, due to the abnormally warm autumn in 2021, winter roads were not accessible for too long and this put the village in a situation where stores were running out of basic food supplies.

The situation got so bad that locals decided to take matters into their own hands and pave the way themselves. It was supposed to be done by an assigned specialized company, but due to the warm winter, it was delayed until the end of January, although it is normally done in the middle of December. Unfortunately, it didn't work and a group of 12 trucks ended up being stuck in the middle of nowhere and had to be rescued.

Thus, air transportation is the only mode of transport available year-round, but it is limited to once or twice a month, and these flights are frequently canceled or delayed due to inclement weather conditions (Sakhaday, 2021).

Because of challenges in transporting products and limited periods of road availability, local stores normally choose products that last long but lack any nutritional value (canned food, refined carbohydrates, etc.). Dairy products, fresh fruits, and vegetables are brought on small scales and thus sold out in a few hours. Obviously, prices are always very high.



Winter truck.

Photo © Zinaida Potapova

The remote location limits the village from having access to high-speed and reliable Internet due to how impossible it is to build proper infrastructure. That being the case, people in Sebyan are isolated in an even broader sense, not only in terms of physical distance but also in terms of their limited access to information and communication technologies. As a result, they face additional challenges in accessing education, healthcare, and other essential services. It all became more apparent when everything went online with the COVID-19 pandemic.

At the same time, Sebyan is famous for being one of the very few places, where the Even culture and language are well-preserved, owing to its isolated location. A survey conducted by Grigoriev (2015) revealed a noteworthy

self-reported proficiency in the Even language among villagers. Out of the 136 respondents, 107 (78.6%) identified Even as their native language, with 85 (62.5%) claiming fluency in speaking it. These percentages surpass the average proficiency rates observed among the Even people residing in Yakutia. In comparison, the 2010 census data indicated that only 20.5% of the Even population in Yakutia reported speaking their native language.

It could be said that remoteness is a blessing in disguise for us. On the one hand, it allows us to be less exposed to other cultures and preserve our own, but on the other hand, it brings plenty of challenges, such as poor transport connectivity and consequent vulnerability to food shortages. Under such circumstances, it is important to acknowledge and embrace the advantages of our traditional livelihood practices. These practices can not only provide access to nutritious and culturally significant food but also strengthen the community's resilience in the face of external disruptions.

Cultural Significance of Reindeer Herding

In this article, I decided to solely focus on reindeer herding as a vital aspect of our livelihood even though hunting and fishing also play an essential role in providing food and maintaining culture and traditions in Sebyan. Reindeer herding has always been at the core of the livelihood of most of the Even people and our community is no exception. It is a sacred animal for us. You can often hear Even people say: "If there is reindeer, there will be the Evens" or "No reindeer, no Even", and vice versa. Plenty of songs, poems, and other works of literature in the Even language carry this message. Not only do reindeer provide us with food, clothing, and shelter, but they can also serve as transportation.

When it comes to the Even language, just like the vocabulary of all languages is strongly influenced by the traditional livelihood practices of the ethnic group that speaks it, the Even language is intrinsically tied to reindeer herding. I am convinced that it is reindeer herding that has been keeping our culture and language alive, despite tremendous pressure from the Soviet government, especially during the Stalin era, to make us fully switch to Russian and give up our ethnic identities.



*Reindeer in early autumn.
Photo© Zinaida Potapova*

I genuinely believe that young people from Sebyan are now able to converse in their native language only thanks to villagers' ongoing active involvement in our traditional livelihood practices.

I can think of many examples when people became conversational after moving around with the herd. Out of all these examples, the most outstanding one for me is the story of my mother. My mother is ethnic Sakha, but she was born and raised in Sebyan, so culturally, she is closer to the Evens. Even though she was surrounded by Even-speaking children, she could barely understand it because they would only speak Sakha in her family whilst in school they were taught in Russian. My mother never got to visit reindeer pastures until she met my father and eventually got involved in reindeer herding. She admits that it is full immersion in the language environment, and the participation in Even traditional activities on a daily basis, that made it effortless for her to become fluent in the language.

Thus, reindeer herding occupies a central role in preserving culture and language in Sebyan. The importance of maintaining traditional livelihood practices cannot be understated, as they ensure the continuity of cultural heritage and the vitality of our language.

A Shift Away From Reindeer Herding and Reasons Behind This Trend

Currently, there are ten reindeer herding enterprises in the village, consisting of one public enterprise and nine privately-owned ones. As can be seen in Figure 1, the reindeer population has been declining at an alarming rate. Specifically, from 2002 to 2018, there has been a significant decrease of approximately 60%.

One of the significant factors causing this is the pressing issue of managing the wolf population in Yakutia. Since the 2005 ban on using barium fluoro-cytate, an effective poison for controlling gray predators, the number of wolves has been steadily increasing. In 2015, the Sebyan public reindeer herding enterprise had a population of over 5,000 reindeer, with only 75% being remained from the previous year's number. Out of a total of 841 deer losses during year, an alarming 798 were attributed to wolf predation, representing 94.89% of the losses (Yakutia Media, 2015).

Consequently, dealing with wolves becomes an additional burden for reindeer herders. Engaging in direct wolf control activities can be a time-consuming endeavor and can take herders away from their primary responsibilities.



*An Even teen girl herding with her dog.
Photo©Zinaida Potapova*

Due to this and other issues, the number of people involved in reindeer herding is decreasing consistently in Sebyan. Some may say that it is something inevitable as everyone strives for a better life which normally implies comfort and security, and they have a point because the lifestyle of a reindeer herder doesn't really fit into that picture. As I already mentioned in my introduction, reindeer herding is extremely demanding and takes a lot of sacrifices, and it is often hard to tell if they are even worth it. Especially, considering how low-paid this occupation is. Probably one of the hardest sacrifices that reindeer herders must make is time spent with their family, especially children. All in all, reindeer herding is extremely challenging but not as rewarding as one would want it to be and it is quite understandable why people no longer want to commit to this lifestyle.

These are internal reasons why people choosing to discontinue reindeer herding, but there are also

external factors that hinder people's ability to continue their ancestral path of reindeer herding. These include various consequences of climate change, which can sometimes be caused or exacerbated by the activity of mining companies, which I will discuss below.

First of all, like the rest of Yakutia and basically the whole of Siberia, every summer we now have to deal with wildfires. According to an analysis of satellite images by Greenpeace International, Russia has witnessed approximately 19 million hectares (73,359 square miles) of land consumed by wildfires since the beginning of 2020. In 2021 alone, the Sakha region experienced the burning of over 8.4 million hectares (32,400 square miles) of forests, which is nearly four times the long-term average (Hirschlag, 2023).

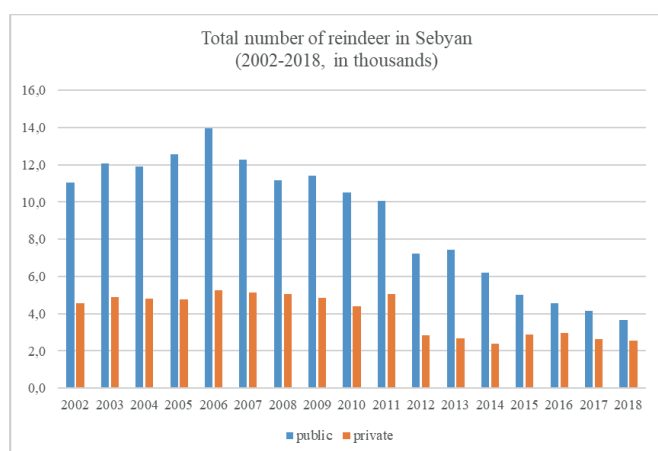


Figure 1. Total number of reindeer in Sebyan from 2002-2018.

Source: *Sebyan Local Administration*

Wildfires pose a threat to reindeer herding in several ways. The fire can destroy the grazing lands and disrupt the traditional migration patterns of the reindeer, while the smoke can cause respiratory problems for both people and animals. While the Sebyan reindeer herders have been fortunate to avoid direct damage from the wildfires, they have experienced an indirect consequence in the form of an increase in predators such as wolves and bears. These animals, seeking refuge from the fires, have stumbled upon the reindeer pastures and it's clear that they won't leave anytime soon now that they have found a place with such accessible food.

Other climate change-related challenges include melting permafrost, changes in the parameters of snow cover, earlier ice drift, and later freezing of rivers which can lead to the disruption of traditional reindeer migration routes between winter and summer pastures

(Popova et al. 2023). In recent years, there has been an increase in research on the impact of climate change on reindeer herding.

One major concern is the significant decrease in winter snowfall, which results in a shorter snow period and an increased occurrence of rain-on-snow events that create dangerous ice layers on the surface (Bulygina et al. 2010, Titkova et al. 2017). This can restrict access to food for reindeer and lead to starvation and even death. The starvation of reindeer can have negative consequences for the nutritional value of reindeer meat for local people (Andronov et al. 2020). A tragic example of this occurred during the winter of 2013-14 in the Yamal peninsula of Russia, where approximately 61,000 reindeer starved to death. This had a devastating impact on the Yamal Nenets, an Indigenous community that relies on reindeer herding for their sustenance (Kater, 2023). In addition, Sokolov et al. (2015) found that a rain-on-snow event causing exceptional mortality of domestic reindeer led to a temporary range expansion of boreal/subarctic predators in Yamal, Russia.



Reindeer herd in wildfire smoke.

Photo© Zinaida Potapova

As previously stated, the environmental problems discussed previously can be exacerbated by mining activities. These can have a negative impact on reindeer herding in several ways. My family has personally experienced many of these adverse effects of mining on reindeer herding since our pastures are located close to the mining sites.



Bear
Photo© Zinaida Potapova

Firstly, the noise pollution and other disturbances associated with mining can disrupt the reindeer and make it difficult for herders to manage their herds. Herding is already a challenging task, and disruptions from mining make it even harder. For example, the presence of noisy machinery and the construction of roads to mining and logging sites can scare away the reindeer, even if there is sufficient food and diverse pastures available. Nellemann et al (2003) indicates that over the past century, undisturbed reindeer habitat in Norway has diminished by 70%, with grazing lands being flooded for hydroelectric dams, further reducing available grazing areas for the reindeer.

Secondly, mining operations have a negative impact on reindeer herding by reducing grazing land, which limits the availability of lichen, the main food source for reindeer in winter. As a result, herders are forced to use any available pastures without giving them sufficient time to recover through pasture rotation practices (Axelsson Linkowski et. al, 2020). This overgrazing can have detrimental effects on the entire ecosystem. Additionally, the absence of reindeer grazing, as observed in the study by Kaarlejärvi et al. (2017), allows fast-growing grasses to proliferate and out-compete other plant species like mosses and liverworts,

leading to a decline in overall plant species diversity. These combined factors highlight the negative consequences of mining on reindeer herding and the ecological balance of the area.

Finally, the extraction of minerals and other resources can result in the discharge of toxic chemicals and heavy metals into the ecosystem, contaminating the land and water. Something similar to that happened in Sebyan, too. In the summer of 2020, locals raised concerns about the environmental damage caused by a silver mining company that operates in Sebyan. Concerned locals wrote to President Putin and shared images of a possible spill on social media, suspecting a cover-up by the company's management. They called for an environmental assessment to investigate the company's responsibility. This was not the first time something like this had happened, three years prior to that there was another spill of over 500 cubic meters of fuel and lubricants into the soil. The company denied responsibility and attributed the groundwater flowing into the river to a natural cause and warned locals that they see it as an attempt to harm their reputation and warned of the possibility of legal action, if necessary. Authorities took samples from the potentially contaminated river but found no evidence of pollution in it.



Reindeer herd during winter
Photo© Zinaida Potapova

In this situation, I think the company's attempt to intimidate people by mentioning legal action speaks volumes about the power dynamics at play. Indigenous people often lack the resources and influence to challenge mining companies, and that's why they always turn to the media to draw attention to their concerns. Similar struggles can be observed globally, such as the opposition faced by Indigenous

communities in the construction of pipelines like the Keystone XL pipeline in North America (Fontaine, 2017). The proposed pipeline by TransCanada would pass through Indigenous territories, raising concerns about the potential impact on their rights and the environment. Indigenous groups, including the Standing Rock Sioux tribe, have voiced their opposition to the project and pledged to fight against it. Similarly, in West Papua, Indonesia, the presence of the Grasberg mine has resulted in displacement, poverty, and environmental degradation for local indigenous communities. The mine's operations have disrupted traditional livelihoods and caused contamination of rivers, leading to the disappearance of aquatic life. Indigenous communities in both cases face significant challenges as they strive to protect their rights and the well-being of their communities (Schulman, 2016).

Having a strong emotional connection to their land and a deep respect for nature, Indigenous communities may react strongly to events that they perceive as threatening to their environment. It is important for mining companies to acknowledge and address these concerns in a respectful manner and maintain transparency to avoid any misunderstandings and promote trust between the communities and the company.

In conclusion, the challenges facing reindeer herding are multifaceted and complex. While climate change and mining activities are two significant factors contributing to the decline of reindeer herding in Sebyan, the low-income and demanding lifestyle associated with this occupation is also pushing people away from it. It is essential to recognize the cultural and ecological significance of reindeer herding and take appropriate measures to support those who choose to pursue this way of life.

The Cost of Losing Our Knowledge: Cultural and Health Implications

Decreased involvement in reindeer herding is concerning in at least two ways. Not only does it mean people are increasingly detached from their culture, but they are also consuming less traditional food, which consists of important nutrients that cannot be found in highly processed store-bought food.

Evidence suggests that decreased consumption of traditional food sources has negative consequences on Indigenous people's health. Lobanov et al. (2018) found

that the loss of traditional nutrition leads to higher rates of hypertension, dyslipidemia, chronic bronchitis, and overweight among Indigenous people compared to the general population. Research also states the positive effects of traditional food consumption. Thus, Andronov et al. (2020) found that traditional food can help reduce hypertension and prevent nutritional-dependent diseases in the Indigenous Arctic population. Similarly, Kozlov et al. (2014) found that individuals leading a close-to-traditional lifestyle within one ethnic group had higher levels of vitamin D than those with a more modern way of life, indicating the health benefits of consuming traditional foods.

Hence, the decreasing consumption of traditional foods highlights a larger issue of access to adequate food and healthcare that extends beyond the Indigenous context and should be, therefore, addressed as a fundamental human right.

Concluding Thoughts

While I acknowledge that change is an inevitable part of human society, I believe that we should not simply accept the loss of reindeer herding and its associated traditional knowledge, considering the huge benefits it can potentially provide. Reindeer herding can bring a lot to the table, not only food but also knowledge. Firstly, it can provide knowledge that is important for maintaining a healthy and diverse diet. It can also offer insights into practices that help to maintain and protect natural resources, thus contributing to biodiversity conservation.

It is especially important not to overlook its benefits in the context of remote communities like Sebyan. Realistically, we cannot expect that the issue of poor transport connectivity in Yakutia and other Arctic regions of Russia will be resolved any time soon. Harsh climate conditions, vast distances, and the low population density in these regions make it difficult to justify the investment in transportation infrastructure. In such a situation, it is important to take advantage of what is already in place, which in Sebyan's case is reindeer herding.

Despite the challenges that reindeer herding faces, such as the impacts of climate change on the Arctic ecosystem and the changing dynamics of traditional nomadic lifestyles, I remain optimistic that it will continue to thrive because traditional knowledge is known to be

dynamic and adaptable, and as such, can evolve to meet new challenges and opportunities.

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ASIA



Wangla Dance Garo Tribe - Photo©Ramesh Lalwani

Laxmi Chaudhary

People of the Terai region of the Himalayan foothills

Nepal

Asia

BEYOND PLATE

लागि गैल जेठक महिना रे, बियार छिटे आव धनावा के बिया भिजैबु, बियार छिटे आव

(Samaj,T.,2021)

This sajna song is sung during the rainy season as we prepare for paddy cultivation. The song requests the singer's family members return home to sow paddy saplings as she makes all the necessary preparations, like soaking the paddy seeds. One of my beautiful childhood memories is plucking the paddy seeds saplings, carrying them to the field my father and brother had already plowed and made ready to plant. Although we would get tired, the feeling of working together as a family on the farm, joking, giggling, splashing muddy water, collecting crabs from holes, and having food in the field, it felt like a celebration. All the hard work in the field while planting was forgotten when I saw steaming white rice in patri; plates made from Nameni leaves, spicy vegetables, and Tama; food from baby bamboo, fish, and crabs. Even now, when it rains, I crave the spicy aalu tama and beans with rice. I think about food and celebrations every time.

When planting paddy, I used to think about the festival we would have in our community, denoting that planting was over. The gatherings of family members; a reunion of married sisters, and good food, rice, pork meat, and mad. Alcohol made the celebration complete. This connection to the food strengthens my relationship with my family, relatives, and community. Food brings so much beautiful memories of my life, but when I call it food, it differs from what is solely served on the plate. It comes from how ancestors discovered it; how it was grown on

the land, how it was processed, and what value it brings in our life. My parents always taught me to see beyond the plate. If you look at it, it is just food, but if you know it, it is you, from where you came and how you evolved. Food, the basic need of our life, also works as a network connecting us as a community, reflecting our life. We do not eat certain food just because our ancestors ate it. There is the science about how land grew; our bodies accepted it when we ate.

Furthermore, when you get to know food, we get to know our ancestors, their journey, and how we exist. We do not only eat food just because our ancestors ate it. While you eat food, you receive nutrition. By gaining knowledge about food, you explore your history and understand how it has evolved over time. Nowadays, in the globalizing world of monoculture farming where junk food dominates the food culture, I believe it is important to share what I have observed in my experience with food and what I have learned about it. This is why you should also consider looking at food beyond the plate.



Figure 1: Stick Shaped Dhikri ©Indu Tharu

Food Nourishes the Soul

Rocio Del Aguila beautifully said, "Food not only nourishes our bodies but our soul too. Every bite is a bite of culture, history, and knowledge that has passed from generations to us" (TEDx Talks, 2017). I belong to Tharu community, an Indigenous tribe from the Terai region of Nepal. Like other Indigenous peoples, the traditional food we eat reflects our lifestyles and history. Let me give you an example:

"But when I call it food, it differs from what only is served on the plate. It comes from how ancestors discovered it; it was grown on land, how it was processed, and what value it brings in our life."

- Laxmi Chaudhary

Dhikri, one of the cultural foods, is a simple dish made from rice flour. For me, dhikri reflects the simplicity of our life and how fewer things can make our life beautiful. In the process of making dhikri, the rice flour dough is made with hot water, and then the dough is molded into different shapes, commonly round and long stick-like shapes. During the festival of Dashai in October, we usually prepare it in five forms, reflecting important

things in our life. One shape is of Bwajha; a bunch of small stick-like shaped dhikri bound by another rope-shaped dhikri. My mother told me that the shape of dhikri denotes a bunch of wooden sticks we use as firewood (Maya Devi Chaudhary, Guruwagau, personal communication, 2020). While my father mentioned that Tharu people are devotees of Pandavas, this dhikri reminds us about the journey of Pandavas. The Bwajha symbolizes the arrow weapon used by five Pandavas during Mahabharat. The clay lamp-shaped dhikri represents the lamp. My favorite is the Chhitni-shaped Dhikri, which is basket-like in shape like those made from bamboo (Bhim Bahadur Chaudhary, Guruwagau, personal communication, February 2023) with roundish small dhikris. I am fascinated by

how understanding food has taught me my own history.

Similarly, the food eaten after the Krishna Janmashtami festival has its own history and importance. Krishna Janmashtami is a festival to celebrate the birthday of Lord Krishna. We celebrate the whole day while fasting and gather at Mahtaan house to worship Lord Krishna. After completing the puja, we break our fast by eating fruits and other foods without grains, salt, and spices. Before breaking the fast, the place where we eat is wrapped up with cow dung. A small fire is placed in the middle, and small portions of our food are offered to the fire first. Then with some splashes of oil and splashes of holy water, the puja is over. The food is served in patri; a plate made from leaves and one empty patri is also kept in which fasting sisters give some food to their brothers. The next morning, after worshipping Lord Krishna and bathing in the river, the same process is repeated, but the food is different. Three to five varieties of vegetables are eaten and offered to the fire and shared with siblings before eating. This specific way of eating makes me realize how our food and culture keep us close, and shows respect to our environment and love to our close ones, which feeds our body and makes the soul happy.

In the first Sunday after the full moon of Krishna Janmashtami, we celebrate the Atwari festival. During this festival, male family members usually fast and prepare food. The fasting people prepare the food, with Roti as the main dish. Interestingly, the first Roti we prepare is cooked only on one side. This tradition originated from the Mahabharat period when Bhim, one of the Pandavas known for his strength, was preparing bread. The Mahabharat war began, and he had to leave suddenly. Others, needing assistance to flip the bread, ended up cooking it on one side only. When the Pandavas returned home after the war, they found the one side-cooked Roti (Bhim Bahadur Chaudhary, Guruwagau, personal communication, February 2023). The Dashai festival shares the victory of good over evil, and within this festival there are five different types of dhikris. Mad is another special thing which is offered to the Lord. Also, as the Tharu people are mostly involved in farming and physical work, drinking mad in the evening is a socially acceptable action to forget work tiredness and to receive a better sleep. One thing about the food eaten in the

Tharu community is that all the food we eat is locally produced and made. For example, the rice, maize, and vegetables we eat are locally grown. Swine and chickens are locally reared, and the alcohol is locally prepared. Jaad (rice beer) is more famous in the community than branded alcohol (friend, personal communication, January 2023). Rice is usually fermented and kept in drums for 1-2 weeks to make Jaad. The household that makes sweet rice beer is often praised in the community, as inviting relatives for rice, beer, and alcohol is also the part of our tradition. While conversing with some local knowledge holders, I learned that the equipment we use while making alcohol, i.e., Karlahi, was invented by the Tharu people themselves (Bhim Bahadur Chaudhary, Guruwagau, personal communication, February 2023). Alcohol plays an important role in connecting us with the community and nature. Historically, we've relied on clay as the primary material for crafting equipment, and this tradition persists as the mainstay in alcohol-making even today. Even though we use the same ingredients and follow the same steps to make alcohol, the preparation time may differ based on the intended use. For example, during Dashaan, we prepare five different types of alcohol. The initial one, Chhakiya, is particularly intriguing as we extend invitations to families from the entire village to partake in its tasting. The remaining four—bherwa, murgi, akharya, and nendri—are named after the respective gods to whom they are offered or the specific time of offering to the gods. During Maghi, which is also known as the new year of the Tharu people, along with Dhikri and pork meat, we eat different types of yam and other things which keep our bodies warm. The next day after the celebrations, we go to our married sister's house to share the food that we prepared in our house to share happiness and support them during times of scarcity. These food sharing activities reminds us that we are there for our families when they need us.

Food also makes us feel that we are accepted, loved, and welcomed by our families and communities. When I visit my maternal

family, my maternal aunt will prepared locally grown boiled and roasted yam, fried peanuts, the bread of Anadi rice, and fried Khariya for me. My grandmother tells us that giving food is a way to show our love and to let our guest know that they are welcomed. So, we usually accept the food when it is offered to us. (Nani, Deukhuri, personal conversation, 2016). We have our own special way of cooking our food: for example instead of frying our veggies, we usually cook them in boiling water. Spices are fried in hot oil and poured onto the vegetables at the end. This not only makes the food tasty but also healthier than deep-fried food. In the food preparation process, cutting vegetables has to be my favorite. My mom and I always have a conversation about our lives while preparing our food, which makes this a very special bonding activity. Once, while we were preparing Kuiral, she shared with me how they had to go to the forest to find these. Now, the domestication of these wild plants has made life easier for us. The time we spend sharing while preparing food together is my favorite time with her.

The food we have been eating for years contains all the nutrition our bodies need to adapt to the climate of this place and fulfill our nutritional requirements. When I started my undergraduate studies, I began observing the nutritional value of my cultural food and realized that our food culture is shaped by the land and human knowledge. As members of the Tharu community are predominantly farmers and engage in physically demanding activities, our diet consistently includes high carbohydrates to meet our energy requirements. There is always Maad growing during the summer days, which is boiled rice with a handful of beans, seasoned with no spices. Fried rice, on the other hand, provides both carbohydrates and protein, essential for energy and the repair and building of our body tissues. Additionally, it helps hydrate our body and can be consumed like water.

We also incorporate a variety of spices into our meals, but one spice that is never compromised is chili. Whether friends visit my

house or when I visit any of my relative's house, the main ingredient that stands out in the food—both in smell and taste—is always chili. However, many people in our community have less spice tolerance. It always made me wonder why most of our food has chili and it is spicy. Little did I know, it has more to do with our metabolism than just taste. As Tharu people living in Terai, an area mostly hot throughout the year, our food metabolism tends to be slow, increasing the risk of food poisoning. Researchers speculate that the capsaicin found in chilies helps to increase blood flow or even alters the gut bacteria's microbiota in helpful directions (Sherman & Billing, 1999). Most spices, like turmeric, garlic, onion, and chilies, have antimicrobial properties helping reduce the risk of food poisoning. This might have provided an acceptable reason for its daily use and acceptance in food culture. The foods we usually consume are local food products and are locally grown on our land, which is why the food behavior changes seasonally. Locally grown fresh foods contain Vitamin C, which is necessary for healthy skin and tissues, although it begins to degrade shortly after harvesting (Bouzari, 2007). Brassica vegetables also contain many natural antioxidants (Gharehbeglou & Jafari, 2019). Ghonghi, a famous delicacy, has high cultural and nutritional value. Its high calcium (Ca), iron (Fe), and protein content make it suitable for supplementing essential minerals. Ghonghi meat is believed to contribute to stronger bones, so it is recommended in cases of bone injuries, weak bones, and other bone-related problems. Additionally, since the meat is rich in fiber, it promotes good bowel movement (Tharuhome, 2021). It surprises me how we have successfully prepared such nutritionally wholesome food to meet our health needs for generations without the benefit of formal academic training.

Emerging Challenges

The perk of understanding food beyond the plate is that you can appreciate its

nutritional and cultural importance along with the trends of change in how food was grown, eaten, and what factors affect this. One of the things I have observed in my community is that, despite having great cultural and nutritional value, traditional foods are slowly disappearing. Globalization has been impacting the lifestyles of people worldwide, and the Tharu community is no exception. The most notable change can be seen in the way of farming. Traditionally, the community practiced Indigenous agriculture with little use of chemicals. The Indigenous food system principle is to balance the ecosystem and protect biodiversity. However, nowadays, we are increasingly leaning towards modern farming, which disrupts biodiversity through the use of chemicals and machines, aiming for easy and large-scale production. The irrational use of chemical pesticides is fostering insect resistance, leading to the emergence of new pests and potentially harmful insects (Tudi et al, 2021). As women are predominantly involved in uprooting grass, this has led to an increased workload for women in the field. The new insects cannot be managed with normal doses of chemical pesticides which leads farmers to use higher amounts of pesticides for pest management and better production. Pests like Salaha (locusts) have adversely affected maize farming in Nepal in the past year.

Disappearing Indigenous Practices

River produce, otherwise known as riverbed grown vegetables, hold a special place as an authentic and popular cuisine within our culture. However, the increasing temperatures are posing a substantial challenge to the survival of aquatic life, directly impacting the availability of key ingredients for this distinctive culinary tradition. Marginalized and Indigenous communities like the Tharu community depend on wetlands for drinking water resources and irrigation for farming and for livelihood in its aquatic biodiversity, i.e., fish and gonghi (Pradhan et al, 2018). However, due to global warming, industrialization, and the unsustainable use of

wetlands these areas are disappearing, and water bodies are drying up. These environmental challenges further exacerbate the precarious state of river ecosystems, posing a direct threat to the sustainability of river produce and intensifying the scarcity of essential ingredients such as fish and ghonghi in our traditional cuisine. While people of the Tharu community and other Indigenous communities use the wetlands carefully and sustainably, the government's action for the protection of wetlands and national parks restricts people which affects their livelihood. The traditional Indigenous food culture and knowledge are disappearing, and the way of living is changing as the people are not free to do fishing (Amnesty International, 2018). The increased use of pesticides in crops, which ultimately mix in the water sources, might also alter the nutrition of fish and ghonghi, negatively impacting people's health in the long term.

Indigenous food culture and knowledge are disappearing, and the way of living is changing as the people are not free to do fishing (Amnesty International, 2018). The increased use of pesticides in crops, which ultimately mix in the water sources, might also alter the nutrition of fish and ghonghi, negatively impacting people's health in the long term.

Hybrid crops are preferred for their large production in less water, mono-cultural farming is now in practice, and the use of chemical fertilizers is high. Excessive use of chemical fertilizers and pesticides in agriculture has disrupted the ecological environment, causing water and soil loss, land degradation, and biodiversity loss (Dai et al, 2015). Diverse crop farming practices have now been converted into mono-cultural farming. Though monoculture farming of hybrid crops helps to better eliminate hunger, it has significantly lost Indigenous crop varieties, aquatic species resources, and food safety issues. Hybrid crops have replaced Indigenous rice crops like Anadi, Asahan, and Gurdi (Jarahan). The seeds of hybrid crops need to be bought every year in contrast to Indigenous crops,

which can be used for sapling for tens of years. As these Indigenous crops have been adapted to our local climatic environment, the locals and government must protect the Indigenous crops to fight the battle of climate change and ensure food security. (Bhim Bhaskar Chaudhary, personal communication, April 2023). Similarly, Dehri and Kuthli, which are crop-storing structures made from soil and bushes, are not practiced nowadays. These food storing practices are climate resilient, last longer, work well without other chemicals. I remember waking up at 4 am to hear my mother's rustling as she steadily headed to the market to sell our farm-grown vegetables. I used to call myself a farmer's daughter, but the production has been so low that my family has to rely on multiple income sources. The climate has been unpredictable; It rains less often and the rain is more erratic. As a result, we face drought during paddy planting and sudden hailstorms during harvesting season, destroying ready-to-sell vegetables. As a result, many male members of my community are leaving for foreign employment, obligating women, children, and the elderly population with household and farm responsibilities. Hybrid crops require large amounts of chemical fertilizers, and the government fails to provide sufficient fertilizers on time, leaving farmers in stress. The subsidy provided to farmers is less, and even that does not reach the marginalized population.

Changing Lifestyle

Our lifestyle is undergoing a transformation, with a preference for convenient, packaged food overshadowing homemade meals. Healthy dietary choices are being overlooked, and empty convenience foods have become predominant in our eating habits. Consequently, individuals adhering to traditional food face unjust criticism and shaming. Traditional cooking methods are not as commonly practiced as modern ones as it require less effort and are popular both in reel and real life. Nowadays, cultural food is typically reserved for home consumption during festivals and celebrations. The convenience, easy

availability, accessibility, and affordability of fast foods attract us and have been able to take place in our daily lives. Food connects me with my maternal home, but whenever my niece visits, we offer her fast food because it is readily available, and she prefers it. It sometimes worries me that children at her age might be unaware of the importance of cultural food. Healthy dishes like Pankhariya, Pandubhuk, Methauri, bari, kanjwa, and many others are rarely consumed despite their importance in our diet. Rice beer is overtaken by alcohol, and alcoholism has been a social problem. Due to the irrational use of alcohol in large amounts, people face its negative health effects and rising violence in the community.

The solution to these problems is to learn why we started what we do, how we do it, and how to continue doing it today. I will tell the upcoming generations that food is the language of love: love with our close ones, and love with our land. It binds us together and reminds us of who we are. We all should be aware of the cultural importance of food, reminding us about our histories, telling our stories, and giving us identity. We cannot escape modernization but should remember the traditional food system and behavior. Why we eat this food and how it started is equally important as what we eat and how we make it. Food helps us navigate the world, know about people, and learn about their cultures and history. Let us all thank our ancestors for their hardships and knowledge. Let us be grateful to them for sharing that knowledge with us. Important as what we eat and how we make it. Food helps us navigate the world, know about people, and learn about their cultures and history. Let us all thank our ancestors for their hardships and knowledge. Let us be grateful to them for sharing that knowledge with us.



Figure 2: Round Shaped Dhikri
©Bunu Tharu



Figure 3: Karlahi ©Indu Tharu



Figure 4: Traditional food storing structures; Dehri and Kuthli © Indu Tharu

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Photo: Laxmi Chaudhary ©Pritam Chaudhary

Purba Elizabeth Drong

Garo
Bangladesh
Asia

GARO INDIGENOUS PEOPLES: FOOD HABITS AND STORAGE PROCESSES

Introduction

Tradition is a practice, such as rituals, beliefs, or the handing down of information or customs, that is passed from generation to generation (Merriam-Webster, n.d.). This passing process can be via verbal or non-verbal communication, such as in writing. Tradition gives us a sense of stability and helps us connect with our roots or pasts- it connects us to people who have come before us or stepped in their footprints as evidence of their existence. It keeps the history of our family alive and gives us a sense of security about their presence.

Bangladesh is a South Asian country that is naturally beautiful and known for its bountiful rivers. It is a very diverse country, with fifty Indigenous communities, the “Garo” community being one of them. There are approximately 150,000 Garo people in Bangladesh, with the country’s total population sitting close to 170 million people, making the Garo people a considerable minority- a minority to which I proudly belong (Banglapedia, 2014). I was born in the village of Songra, which is located near the border area of Bangladesh. Most of the Indigenous communities live in the districts of Mymensingh, Netrokona, Tangail, Sylhet, Sunamganj, Sherpur, Khagrachari, Rangamati, Bandarban, Kishoreganj, Gazipur, Rajshahi, and Jamalpur. Each have their own traditional ways of preserving foods, and by following their various strategies, they are able to store foods for years. As an example, the Garo’s use “Gompha” (a Garo word that means food bank) to preserve food for times of natural disaster and to protect foods from the attack of insects. However, these processes are not being practiced regularly now, and for this reason, this food-storing tradition

is being forgotten about by younger generations. Therefore, the purpose of this article is to relay some research findings on Garo Indigenous traditional food storage and preserving processes.



Photo: “Garo Nomul” (Garo young girls) in their traditional attire ©Farhin Binte Lalam(Audri)

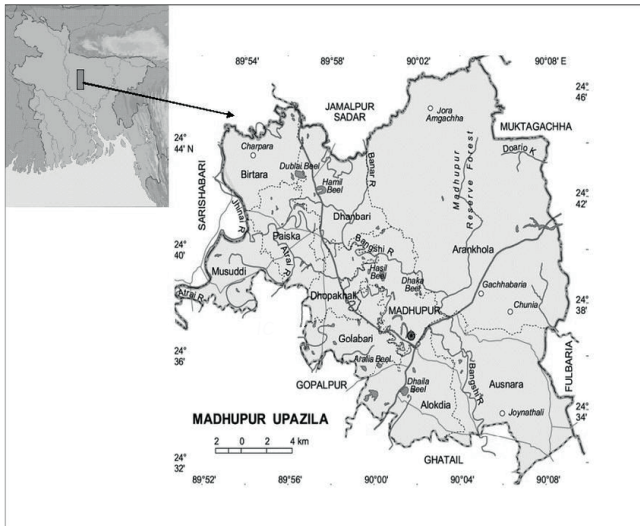
My Connection to Garo

I belong to the Garo Indigenous community of Mymensingh district, located in the northern part of Bangladesh. Since I grew up in a Garo family, I have a strong connection to my community as well as neighboring communities. This connection makes it easier for me to conduct research with various local leaders, as I already have a strong foundational knowledge about us and am better able to communicate. My country uses various food preservation methods depending on the region. From childhood, I have seen my ancestor’s preserving food in our traditional ways for the uncertain future, however, this original process of food preservation has been deteriorating between generations. The processes have not been adopted in the same way our ancestors used them, and our current generation has very little knowledge about our traditional ways of preserving foods. I am conducting this research

so that I can learn more about our traditional ways, revive it, and educate others on the value of understanding or utilizing those tactics.

Purpose of Study

This research is intended to better the Garo community's understanding of the ability to efficiently sustain its customary food storage method. This article will explore traditional food habits and storage processes of the Garo community. I am recording these, as it is important for the next generation of Garo to understand how we store and process our food. I am also hopeful that it will encourage other people from my community to engage in research. Food preservation enables people to keep their traditional meals and recipes alive across time and is crucial for maintaining cultural continuity. Food that has been preserved can be kept for longer periods of time, allowing people to enjoy the same foods and dishes all year long, even when they are out of season or not readily available where they live. This is especially crucial in societies where traditional foods remain an integral element of social gatherings and rituals and play a big role in cultural identity. People can pass on their cultural heritage to future generations and maintain their cultural customs by maintaining traditional meals.



Map of Bangladesh

Source: Muhammed, N et al. Map of Bangladesh, 2011, [Cited 24 April 2024] https://www.researchgate.net/figure/An-Overview-of-Garo-Population-in-Bangladesh_tbl1_265291382

Notes: The boundaries and names shown and the designations used on this map do not imply endorsement or acceptance by the United Nations.

Contextual Analysis

The Indigenous Garo people are located in the northeastern area of Bangladesh. We have developed a reputation for our unconventional food preparation and storage methods. In this literature review, I will explore the various aspects of traditional Garo eating practices and food preservation strategies of Garo people. As the majority of Garo people are farmers, the bulk of our traditional food comprise rice, vegetables, livestock, and fish. We consume different types of rice, including white boiling rice, sticky grains, and red rice. Additionally, our diet consists of a variety of meats, such as hog, cattle, and chicken. Perhaps the most substantial amount of our food, though, consists of vegetables, including beans, pumpkins, and gourds, among others. We also consume a great deal of fish, preparing it in a variety of ways such as smoking, grilling, and fermenting. According to Narzary, Yutika & Brahma (2016), fermentation has been used by people of many cultures from ancient times to improve the flavor of food, increase its nutritional content, and lengthen the amount of time it can be stored before going bad.

Rice is the most important source of nourishment for Garo people. According to Mishra et al. (2015), Garo people extensively rely on home-brewed defatted rice wine. This beverage and the way of producing it holds an important cultural and social significance in the lives of Garo people who come from a variety of ancestries. The fermentation process takes place in earthen vessels called "mutki," which are large sized pots made of clay, and the formation of the beginning culture calls for the utilization of herbal treatments that are readily available in the surrounding area. Documenting the traditional method used in the production of the fermented drink is relevant to my goal of recording our food processes for future generations. The majority of studies on Garo society have concentrated on the monetary value of food, viewing it as little more than a requirement and a raw commodity that plays an essential role in an environmentally viable low-income economy (Queenbala, 2014). When it comes to food, the Garo people always trade dried

fish for rice grains, snacks like boiled sweet potato or manioc, raw beef, and on occasion raw pork. The nutrition transition, which is characterized by a quick change in food and lifestyle, is connected to an increase in the number of cases of disease that occur in Indigenous cultures. Modernization and globalization that infringe on the livelihoods and territories of Indigenous peoples, that undermine their economic systems, values, and solidarity networks, have been linked to an increase in the prevalence of diseases which require prolonged treatment among Indigenous populations (Damman et al., 2008). There is a possibility that food aid and several other measures like availability, access, utilization and stability pertaining to food security would play a role in propelling this nutrition transition. It is possible that the rising rates of serious conditions like scarcity and unavailability of our traditional food items in Indigenous communities can be slowed down by adopting food policies that respect Indigenous peoples' civil liberties, particularly the ability to enjoy our culture.

Sources of Knowledge

Garos use various methods for food preservation, depending on the region, as a result of the differing availability of ingredients and other food elements. Different tastes are another reason for these variations. As mentioned earlier, the food preservation methods practiced by the Garo ancestors are not being effectively passed down through to the younger generations. The current generation of Garo people have very little knowledge about their traditional ways of preserving foods. In an attempt to help mitigate the implications of this problem, I conducted interview-based research in the villages of Askipara, Songra, and Haluaghat in the Mymensingh District. A variety of different people participated in this research, including elderly people, working-aged people, housewives, farmers, and professional researchers. Each contributed valuable pieces of their personal knowledge and experiences, culminating in this final amalgamation of information regarding food preservation processes for the Garo peoples.



*Photo: Interviewing Garo Communities
Photo ©Purba Drong*

Food Storage Processes

Gompha Nok

A traditional loft house of the Garos which is usually made of thatch, wood, and straw. It is mainly made for the purpose of storing rice paddy throughout the year. In the passage of time, such Gompha Noks are almost extinct because of modernization of the Garo people. They are being replaced by bricks or tin shed's house. Gompha Nok is built on a base of ash, stones, bricks at a height of three feet from the ground. Stones are easily available in hilly areas, so the use of stones is more common in those areas. The walls of the Gompha Nok are usually made of thatch, which is coated with dung on the inside so that there are no gaps and insects cannot enter. This house is built higher than the ground to protect the paddy from natural calamities such as storms, rains and floods. Even though the Garos have been keeping this tradition for ages, this type of house is about to disappear with the passage of time. They now use tin as the roof of the Gompha Nok. The use of tin is also seen in many cases as a wall. At present many people use brick cement separate storage rooms or normal tin houses as an alternative to this house. "Dulli" is a funnel-shaped drum made of bamboo used by the Garo people inside the Gompha Nok for storing rice. "Dulli" is still used, but plastic drums have come into use as an alternative.

Jaam Nok

Another form of Gompha Nok is Jaam Nok. It is said to be a modified and smaller version of Gompha Nok. It is usually made of tin or a lift inside the house,

the breadth of which does not cover the entire house. It is made only in a private house or in a certain place of the house. Its purpose is exactly the same as that of Gompha Nok. Its main purpose is to store rice out of the reach of storms, insects, floods or children. Jampha Nok is now rarely seen due to more modern styles and advancements.

Nakham Gundi / Gundai

Garo peoples have different dialects in our native languages– the main or official written language is called “achik” language, though it is mostly spoken by the Garo peoples from Meghalaya, India. However, there are other dialects, including chibok, abeng, migam, atong, duwal, among others. For this reason, there is variation in how Nakham Gundi is spelled, with Nakham Gundi as the proper term in abeng, and Gundai in chibok. The dish itself is a preserved fish item that is processed in a special method that saves it for future use. The processing begins by collecting puntius fish from canals, ponds and rivers or buying them from markets. After cleaning and washing thoroughly, the fish is kept under the sun to dry properly. The dried fish is then grinded in a husking pedal until it is crushed. The crushed fish is preserved in a clean bamboo shoot called a Chungga, which should be brand new and never used previously. The shoots are not fully filled– 1/5th part is kept empty in the upper side. Then, the vacant part is filled with lots of lime or pomelo leaves. Next, the shoot is sealed and shut with clay. It is done to keep the crushed fish fresh and protect it from insects. The lime or pomelo leaves are kept for their smell, as well.

To dry up the clay, the bamboo shoot is kept over the bamboo loft, which is located above the stove in the kitchen. This kind of bamboo loft is called “Ongari”. The shoot is kept there for about seven to ten days so that the wet clay dries up and has a chance to harden. Within ten days, the outer part of the shoot turns black, and the cherished Nakham Gundi will be prepared for preservation. Over time, this Nakham Gundi tastes even more delicious. But the Nakham Gundi is not eaten like this; it’s just a raw food element that is used in our various types of recipes. The dried bamboo shoots are kept in a corner of the kitchen, or in a safe and comparatively cool place in the house. The bamboo shoots are dried for preservation only, the main

item, Nakham Gundai, is consumed in its raw state in various recipes.

Fura

Fura is another traditional food element that is used in different recipes. It is a type of powder made from white rice, generally by grinding it in a husking pedal. Before grinding the rice, it is washed properly and macerated for at least one hour. It can also be stored for long periods of time. Whether produced by a modern-era machine, or a “tengki” (a manual husking machine), it can be stored for up to one year. However, if it is made with a tengki, the powder must be exposed to sunlight periodically.

The ingredient “gai” is solely used to create traditional drinks, and a white rice powder is ground to make it. In essence, it is a “fura” itself but with a different process. A round shaped gai is created on paper, straw, or cleaned fabric after the fura has been ground. The previously prepared gai is then softly smeared and stirred on top of it. Traditionally, it was placed on “ongari,” maintaining a sieve with the straw, paper, or cloth until it dried up. Sunlight may also dry it out. It needs seven to ten days to dry and solidify but can last for years in storage.

Khoi Gundi / Gundai

Garo peoples also use rice flour, called “khoi gundai” or “khoi gundi.” Rice is washed, dried, fried, and then ground, and can be consumed with or without jaggery or sugar. Either sticky rice or par-



Nakham Gundai / Gundi



Ongari



Rummol (an instrument used as an alternative to a “husking pedal”)

All Photos:©Purba Drong



Gai



Khumkha



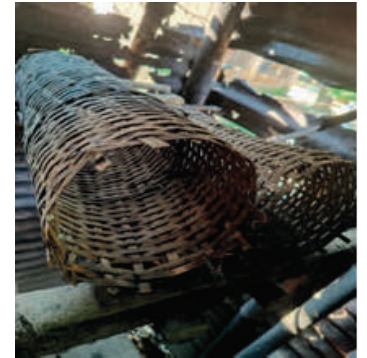
Fura jaba



Kasum / Fasum



Allot Bibal



Janti



Tengki (husking pedal)



Sthi (fermented rice that remains after dissolving the liquid "chu," used to feed domestic pigs)



Micheng



Khari jaba (with Fasum)



Traditional fong



Garos peoples processing micheng for cooking



Mutki



Shobok



Micheng jaba (with fish)

boiled rice can be used to make khoi gundai.

Other Food Items

The Garo peoples consume many different kinds of food than the mainstream Bengali people. They take rongchu (known as poha), thamalang (sweet potato), thabuchu (cassava), khumkha (tit begun), meyaa (bamboo shoot), menda (roselle/sorell), kengkul (one kind of fruit produced in lands or grounds), kasum / fasum (stink vine), tha'a (bulbous root of the arum), stheng / thajong and thamachi (various types of arum), kuiccha (eel-fish), allot bibal (vasa/ Malabar nut), thanek (mint), micheng (kind of spinach), shobok (plantain flower), pagua (banana stem or thor), sufuru / chucchru (snail), khangkhi/ hangkhi/ khangkhai (crab), mikhop (maize), and so on.

Recipes

Above I have outlined the different ways of storing and preserving food for Garo peoples. Below are some of the meals that we prepare with our stored foods.

Nakham Michi

Onions, green chillies, taki fish, or other kinds of fish, are poured in hot water on a frying pan. When the fish has been boiled, a small amount of "nakham gungi" is added. Then, after allowing it to boil for a few minutes, the curry is prepared, turning into a dark black colour. Khari Jaba

"Jaba" means curry in Garo's mother language. Khari jaba can be made of pulse, meat, gourd or wax gourd, brinjal, tit beans, etc. After completing the regular recipe, a small amount of baking soda is applied to it, creating a different smell than most other curries. No oil is used in this recipe.

Fura Jaba

We already discussed the preservation system of fura. Fura can be applied to meat, snails, and other

items. It is also spread on curry when the curry is nearly finished cooking. After spreading fura, the curry has to be shaken continuously so that it does not loaf. Fura is classified into two types: "khari fura" is cooked without using oil, and "tel fura" uses oil in the recipe.

"The processes have not been adopted in the same way our ancestors used them, and our current generation has very little knowledge about our traditional ways of preserving foods"

- Purba Drong

Bilni / Binni Mi

"Mi" essentially translates to rice in Garo language, while "binni mi" or "bilni mi" means sticky rice. This rice is cooked in two ways: first, it's cooked by the steam of hot water by setting two pots, one under another; the second method is the more common method of simply adding rice directly into a pot of water, which is called "mi pellek."

Chu

Gai is a powder ingredient that is used to make chu. Chu is a traditional drink for Garo people. There are two types of chu: chu gobbok and chu bicchi. Chu gibbok is made from white rice, and chu bicchi is made from sticky rice. Chu gibbok is comparatively cheaper and easier to find than chu bicchi, largely because of its ingredient availability. Chu bicchi is a little bit expensive, and only occasionally served among guests, though it is usually reserved for social events and celebrations. To make chu gibbok and chu bicchi, rice is boiled and spread on a rug to cool to room temperature. Then, gai is applied throughout the rice. Next, this mixture is preserved in a mutki, with a filter called a "janti" set up in the middle. The mutki is sealed with banana leaves and clothes to stay protected from insects while it ferments, which can take anywhere from two weeks to a year— though, the longer it ferments, the better it tastes. Garo peoples use a "fong" to drink chu, which is a specially processed gourd made of glass.

Micheng

Micheng is a type of spinach that is mostly found in hill tracts. It is lubricated and is cooked with fish, but it is rarely found in Bangladesh now.

Harvest Feast “Wangala”

Garo peoples are very culturally minded. We celebrate different occasions and follow various rituals– The “Wangala” festival is one of them. It is considered the biggest festival according to our ancestors’ religion, “Sangsarek.” Due to the conversion to Christianity, the majority of this community is now Christian, and only a small number of people are still following Sangsarek religion. Despite this, the Wangala Festival is still being celebrated. It is a harvest feast, which is essentially a Thanksgiving ceremony to the god called “Misi-Saljong,” who we thank for blessing us with the rice harvest for that season– it is usually celebrated in the last few months of the year.

Necessity of Food Preservation for Cultural Continuity

It is impossible to overstate the importance of food preservation for cultural survival. Food is more than just fuel for the body; it is a tremendous storehouse of tradition, history, and identity in any culture. Through the use of food preservation techniques, it is possible to ensure that a culture’s distinctive flavors and culinary customs are passed down through generations. These traditional techniques for food preservation, such as pickling, fermenting, and drying, have been developed over centuries to adapt to particular climatic conditions and the available ingredients, making them essential to cultural resilience. Societies can keep a vital connection to their history, promoting a sense of belonging and identity by safeguarding these culinary traditions. Additionally, sharing preserved foods often involves storytelling and collaborative celebration, reinforcing the ties that unite a community and ensuring that cultural continuity is alive and well.

Conclusion

As a result of modernization and globalization, the traditions, cultures, and languages of the Garo

peoples are at risk of becoming extinct. Some things are currently more at risk than others, including gompha nok, jaam nok, rummol, fong, among others. In order to maintain these important foods and preparation methods, Garo communities must continue to practice their traditional ways. It is also important that researchers continue to document their existence, as having written documentation of these foods and preparation methods may be needed in the future, if their traditional practices are lost. The world is beautiful because it has diversity. Every unique nature of a community makes them different from the other community. Instead of relying upon reading about the culture of the Garo peoples in a book or journal, we must keep it alive in actuality. Though some NGOs are working on it, the government of Bangladesh should be aware of the risk posed to Garo cultural traditions and take steps to preserve it. This is not exclusive to only the Garo peoples– it is also important for the 50 other Indigenous communities of Bangladesh.

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THINK PIECE: INDIGENOUS PEOPLES FOOD AND KNOWLEDGE SYSTEMS

The global food system has undergone tremendous changes, starting from the era of Industrial revolution, where mass migration of workers required a radical demand based production of food. This give birth to quality and mass food production technologies (UNFAO,2017). During the wars, these technologies were used both as weapons and as strategies to cut off supplies, leading to mass starvation. Consequently, these unprecedented changes have resulted in today's complex and irreversible food system (Kemmerling, Schetter & Wurkus, 2022). It is not only challenging for producers to navigate, but consumption has also become unmanageably diverse due to personal preferences and health concerns arising from adulterated production.

Through all of these developments, it's the Indigenous food system that has survived and continued to provide food security, high nutrition, social identity, and environmental stewardship to the community and the land on which they depend. All of which is a struggle to maintain within the current global mass-consumed food system. Some of the common features of Indigenous food systems across the globe include the emphasis on multi-crop cultivation and consumption of a wide variety of produce, which is considered nature's bounty and seldom requires human intervention. The concept of "commons" in resource sharing and labor work, while maintaining logistically decentralized production locations, is also what keeps the community invested in ensuring that no one is left without. Meanwhile, the socio-cultural values attached to farming and agricultural cycles are put into practice through elaborate rituals and

gatherings to honor nature, land, and its produce. Producing and consuming food in Indigenous cultures is not seen just as a task but as a cultural and spiritual practice, which is a way of life for them. Then come the questions: How has the Indigenous food system not only survived but thrived amidst the myriad global challenges and disruptions? What factors have enabled indigenous communities to steadfastly maintain their intrinsic relationship with food, resisting the prevailing demand-supply narrative of the global food economy? I firmly believe that safeguarding such invaluable Indigenous knowledge and values necessitates a formidable force capable of passing them down through generations, withstanding the tests of industrialization, colonization, wars, famines, and even recent events like the COVID-19 pandemic. I believe that this resilience is personified in Indigenous women, who occupy a central role in preserving and transferring the wisdom of indigenous food systems.

When a Maasai woman ties her child onto her back using a leso and wanders the savannah in search of wild berries and fruits, the child learns the importance of their surroundings and food even before they learn to speak. The story of Manoomin rice and how it helped the Ojibwe tribe survive is often shared by women with their children, instilling the belief that food is indeed the source of life and must be safeguarded.

When a Lotha mother painstakingly peels and dries colocasia leaves to send to her children living far away, she ensures that the next

generation is not deprived of the food from their land and that sharing can transcend distances. Such knowledge and a profound relationship with food cannot be cultivated through the consumer-centric, impersonal marketing tactics of the global industrial food system. Indigenous women choose to embrace this responsibility every day, passing down this knowledge from one generation to the next, encompassing its philosophy from production to consumption. It is a marvel that these cultures have managed to preserve most of these ethos and practices, despite the numerous challenges that have made it difficult for women to continue this generational work

The post-colonial world is in disarray, especially in Indigenous communities where gender roles are intricate and contextually linked to culture, work allocation, and Indigenous rituals within the community. However, the advent of colonialism imposed blanket rules on gender roles, making them dependent on power and economic influence. Colonialism exploited the complex gender roles in Indigenous cultures to the point of devaluing the role of Indigenous women in their societies. When the traditional lands of Indigenous people were usurped by colonials through violence, manipulation, and treaties—often portraying the colonials as reformers, helpers, and friends of the people—the backlash was borne by women, who had to adapt to these social and land changes. In the process, they lost their leadership in the community's food system and access to suitable nutrition for themselves and their families. Native produce was replaced with non-native varieties, mass-produced using chemicals, while wild foraging, considered uncivilized, was banned from practice in the wild lands. Moreover, due to the growing patriarchal influence of colonialism, women were oppressed by men who assumed new power and alliances with the usurpers. They suffered in silence while adapting but managed to continue practicing and passing down traditional knowledge and practices against all odds.

Today, we continue to overlook the enduring hardships faced by Indigenous women, who serve as guardians of wisdom, protectors of the land, and stewards of future generations. It is a giant leap that humans have taken by realizing that the world can only progress by sustainable means. Especially as an alternative to the disrupted mass consumed

food systems, native and Indigenous systems are being used as examples of resilience and sustainability. The narrative yet only seldomly captures the agonizing journey that the Indigenous women have had to take to keep this traditional food system alive. At this juncture, it is not only important to acknowledge the contribution of Indigenous women but also necessary for collective action to recognize them as leaders of the global food sovereignty movement. The role of Indigenous women in global and local food systems is slowly coming to light as feminist and decolonization movements permeate Indigenous cultures. It is crucial to seize this opportunity and build a collective voice from our own backgrounds and communities. It is not for nothing that in almost all cultures and societies, the earth and nature is a mother, by the very virtue that it provides for the whole of humanity's wellbeing.

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Preety's grandmother from the Lotha tribal community in Nagaland praying to the spirits of the forest before entering
©Preety Sharma

Preety Sharma

*Lotha Tribe
India
Asia*

THE PERFECT CHICKEN DISH (HONOSO OHAN) ALONG WITH ITS SOUP

Ingredients

Local Chicken - 1 whole
Tomato - 1 nos
Home made bamboo shoot vinegar - 100 ml
Ginger - 2 thumbs size
Locally ground Red Chilli powder - 1 tablespoon
Salt - To taste



Honoso Ohan©Preety Sharma

Process

1. Preparing the chicken - Remove the primary feathers of the chicken. Pour boiling water on the bird to help remove the inner feathers and the rachis easily. Rotate the bird on the fire to remove any baby hairs and impurities. It should not need further cleaning with water after this. Then with clean strikes separate the claws and the head of the chicken; make sure you do not drain out all the blood. Make an incision and cut the chicken from its underside to remove the gizzards and intestines and put it in a separate vessel. Take the intestines and use a long metal/wooden skewer to clean it inside out in hot water. Cut the stomach in half to clean it from inside. Now take the chicken and make pieces of the meat.
2. Fill a deep vessel with 1.5 lt hot water and put all pieces apart from the intestines in it. Add salt and sliced ginger to it.
3. Let the water reduce to 50 percent and then remove half the soup. This is nutritious for new mothers, elderly people and if you are feeling weak.
4. To the remaining meat and soup add cut tomato, chili powder and bamboo shoot vinegar. Cook it for another half an hour on the fire with lid closed
5. Remove the dish from fire after half an hour and keep the lid closed for sometime before enjoying it with hot rice and chutney.

Disclaimer: This dish tastes best when made on wood fire in an aluminum vessel.

CENTRAL AND EASTERN EUROPE, RUSSIAN FEDERATION, CENTRAL ASIA AND TRANSCAUCASIA



Photo: Karachay house utensils and wineskins ©National Museum of the History and Culture of the Karachay People

Mariam Tambieva

Karachay

Russia

Central and Eastern Europe

Russian Federation, Central Asia and Transcaucasia

KARACHAY AND BALKAR INDIGENOUS PEOPLE ZERO-WASTE PHILOSOPHY AND LIFESTYLE

Introduction

Since ancient times, Karachay and Balkar people have lived in close connection with nature. Food and prosperity used to be obtained by hard work. Therefore, everything they received was treated carefully and with great respect. Modern urban humans have a lot to learn from the Indigenous people, still living in close connection with the land. Mountain communities adhered to the philosophy of a thrifty attitude to nature and its gifts long before the zero-waste concept was invented. Their methods are easy to apply; there is no need for special equipment. These methods allow us to show respect to nature and lands, and to save resources and time. These zero-loss methods also help Indigenous people save themselves. We should adopt this experience improved over centuries of practice. According to Zero Waste International Alliance (ZWIA, 2018), zero-waste is defined as: “The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health.” In writing this paper, my goal is to call the attention of scientists and food industry specialists to Indigenous people’s knowledge which has been implemented and improved over the centuries. This could help minimize losses, especially for householders; this is significant because they are the main producers of food waste.

The United Nations Environment Programme (UNEP) Food Waste Index (Forbes et al., 2021) indicates that globally, households wasted more than 567 million tonnes of food in 2019. This is more than 60 percent of the total food waste in the world, more than retailers or restaurants (p. 8). This is happening because modern households do not know how to properly preserve meat, dairy or vegetables. Additionally, many have no idea what to do with leftovers, while at the same time more than 489 million people all over the world have nothing to eat today. Even in developed countries, every twelfth person faces food insecurity, according to the Food and Agriculture Organization of the United Nations (FAO) statistics (2022).

Zero-waste practices can help every family and society by saving more resources, such as nature, lands, and pure water. Hopefully, we can build communities experienced in prudent house-holding. In this paper, I will share Karachay and Balkar Indigenous people’s experience and philosophy on how to use everything nature gives you: with respect and no loss.

Karachay and Balkar Methods

My people can offer an understanding of how to live in a zero-waste world. Even though Karachays and Balkars never used the term “zero-waste,” we have lived according to this philosophy for centuries. Foremost, we respect the hard-working lifestyle in the mountains, and we respect all that God and nature generously give. Some of these traditional methods should be researched by scientists as a source of new

ideas in different industries, not only food processing. For example, when the Karachay and Balkar people made mortars, they used rotten eggs as a cement for building crypts. They have endured the tests of time, deportation, and tourist visits; crypts are still safe, after many centuries.

It should be noted that, despite difficult living conditions up in the mountains, our community has experienced hunger or malnutrition just a couple of times over the centuries (Tekeev, 1989). Moreover, our traditions of reasonable consumption helped my ancestors survive oppression, genocide, land confiscation, and hunger during the twentieth century. Sonya is my Annya; that is what we Karachays call grandmothers. She survived World War II, repression, and the deportation of Karachay people in 1943. Because of her rich family, Union of Soviet Socialist Republics (USSR) schools did not accept my grandma. She had only a three-class education: she could read and write and had a basic knowledge of natural sciences. However, Annya is still the wisest person I have ever met in my life.

Growing up in high mountains in a Karachay family, Sonya received all knowledge traditionally, through legends, proverbs, and tales. Moreover, she learnt housekeeping traditions from her grandmother and mother. My grandparents started life anew three times: deported to Asia with nothing, turning back to the Caucasus and at the ninetieth after the disintegration of the USSR.

During 1943–1944, the USSR conducted mass deportations of various ethnic groups, including Karachays. People were forcibly relocated to remote areas like Siberia and Central Asia under brutal conditions that included famine, disease epidemics and direct violence. It is estimated that hundreds of thousands, possibly over a million, died as a result. People lived as though imprisoned and could not leave the area for years. Some of the deported nations were allowed to return to their homelands after Stalin died. Karachay people were turned back in 1957, after 14 years of violence. In 1991, the USSR government admitted these actions were unjust and unlawful. Deportations are now widely recognized as acts of genocide (“Deportation of the Karachays,” 2023).

I am sure my Annya could manage all this only because she was a Karachay woman, keeper of traditions and secrets – she knew how to organize life in the high mountains. She knew how to feed a big family with only one cow on the farm, and how to cook one small piece of cheese for dinner. Sonya gave life to six kids and 15 grandkids and taught all of us to be Karachay in the best ways. Surviving typhus and months of severe hunger in 1943–1944, she literally knew the price of a piece of bread. Annya taught me to cook and respect food, and to use it wisely. She still inspires me to research North Caucasus cuisine, even though she died in 2003.

Throughout this paper, you will notice proverbs from my people and stories about my Annya. This is a nod to what Ahenakew (2014) calls for: a shift from sensemaking to sense sensing. I invite you to embrace these disruptions in the writing and to consider what these proverbs offer us as we head towards a zero-waste society.

The Food System of the Karachay-Balkar Indigenous People

Karachays and Balkars are fraternal peoples with a common history, ethnogenesis, and culture. We speak the Karachay-Balkar language (Turkic group of the Altai language family). Our majority is Sunni Muslim. We are North Caucasus natives (“Karachays,” 2023).

For centuries, we lived in the high mountain valleys around the Elbrus Mountain in the North Caucasus. Now, these lands belong to the Karachay-Cherkess and Kabardey-Balkar republics, the Russian Federation (Russian Fed Northern Caucasus Base Map, 2013). Until the nineteenth century, our people lived mostly independently, producing most of the necessities for life on our own.

Karachays and Balkars have been breeding animals since ancient times. Through artificial and natural selection applied over the centuries, we have bred our own breeds of sheep, cows, horses, and shepherd dogs (Karaketov & Sabanchiev, 2014). These animals are well-adapted to living in high mountain pastures. For centuries, my people have practiced transhumance animal husbandry. During the sum



Source: European Commission. 2013. Northern Caucasus (Russian Fed.) Base Map. [cited 5 November 2024]. <https://ercportal.jrc.ec.europa.eu/ECHO-Products/Maps#/maps/170 Russian Fed Northern Caucasus Base Map, 2013>

Notes: The boundaries and names shown and the designations used on this map do not imply endorsement or acceptance by the United Nations.

mer, herds were sent to high mountain pastures and alpine meadows for free grazing. In autumn, they returned to the villages, to graze on winter pastures and be fed with fodder prepared in the summer. The necessity of following these animals during their movement has left a distinct imprint on the Karachay and Balkars lifestyle. All summer long people harvested cheese, cream, and butter. In autumn, after the animals reached maximum weight, they were selected to be butchered to feed the community, and surplus animals were either sold or exchanged. The rest were scored, just enough to feed the family until summer.

This affected the cuisine and lifestyle of the Karachays and Balkars: men left their villages for 4–5 months and lived at mountain summerhouses with a minimum of amenities and utensils. Therefore, for this season, products were prepared for future use by men. Provisions for summer camps had to be easy to transport, easy to cook, and satisfying. This hard work taught people to only use what they needed, as everything that was needed to survive came with very hard work. This resulted in minimal food waste.

The remains of this philosophy can be traced in national recipes, education methods passed on by word of mouth, and in the national code of ethics and proverbs. Proverbs and sayings reflect the at-

titude of Karachays and Balkars to food as a necessary condition for life. Harsh living conditions, harsh climate and exhausting physical labour demanded a person's energy and endurance, which could not be replenished without high-calorie food. Naturally, a person who worked hard physically had to eat accordingly.

Айдан — джыл, джылдан ёмюр. (Aydan – djil, djildan – emur).

From a month – a year, from a year – a century. A lot comes from little.

Karachay and Balkar proverb

If You Slaughter an Animal, Use Everything It Gave You, No Waste

Karachays and Balkars have always known the importance of using the whole animal. They used all components of the animal from the meat, bones and offal to cook different food and preserves. Thus, the carcass of the slaughtered animal was used completely, with nothing thrown away.

Tails, stubble, down and feathers were used for decorations, clothes, equipment, pillows and duvets. Horns and hooves were used to make knife and cutlery handles, bijouterie, toys and drinking cups (pic. 1).



Photo: Karachay house utensils and wineskins ©National Museum of the History and Culture of the Karachay People

Carpets, coverings and clothes were made from leather and wool. Also, animal skins were used to make special wineskins for storing ayran (a Karachay-Balkar type of yogurt), milk, cheese and butter, as well as grains and flour. These “bags” were stored by being hung from the ceiling in the cellar. Moreover, wineskins were the best to take on the road, just behind the saddle (Tekeyeva, 2017).

Men had to butcher the carcass in accordance with specific rules, without damaging the skin and flesh. For example, the carcass was butchered anatomically, cutting off pieces of meat at the joints. They tried not to cut the bones so as not to spoil the meat. Masters were known and respected; many men desired to do this work best, with minimal loss. Even after the Karachays and Balkars stopped eating blood and spleen for religious reasons, they were not thrown away and became food for dogs. The contents of the stomach and intestines were then added to the compost heap and were later used as a fertilizer in the garden.

Karachays and Balkars still use the stomach and intestines for food. One of the most famous recipes is djerme, homemade sausages with a small intestine, caul fat, trimmed meat, rice and spices wrapped into pieces of a scraped sheep or cow stomach. These sausages can be dried, smoked and eaten for many months. The Karachays and Balkars also used a special method of preservation: the cooked sausages were dried, fried in fat, placed on the bottom of pottery, and hot melted fat was poured on top. The cooled dish was stored in the cellar for months.

As we head towards a zero-waste society, it is important to recognize that Indigenous people have models for this, as we can see in their use of the whole animal. The Waste and Resources Action Programme (WRAP) indicates that 400 000 tonnes of meat are wasted in the United Kingdom of Great Britain and Northern Ireland every year, mostly at home (WRAP, n.d.). At the same time, even in Europe every twelfth person is facing food insecurity, according to FAO (2022). More than 30 percent of women and kids under 5 years old in the world have anemia because of malnutrition. The World Health Organization (WHO, 2021) defines anemia as an indicator of both poor nutrition and poor health.

The world produces enough food, but many people suffer simply because we cannot share and handle it wisely. Meanwhile, Indigenous communities have centuries of experience preparing delicious food and keeping it for a long time without technologies requiring energy such as light, refrigerators, and so on. Indigenous knowledge could help decrease food wastage and make meat products more available.

Indigenous communities still hold knowledge about edible wild greens and fruits, which could make our diet healthier. Plants are readily available nutritious foods, but many people are not aware of what is edible. One example of this is nettle; it is a healthy product, rich in fiber, vitamins and minerals (Bhusal et al., 2022). This plant grows wildly in many regions, has intense flavour and satisfies hunger. Caucasus people preserved recipes to cook delicious nettle pies, soups, dumplings and so on. We literally can cook an entire dinner with nettle (Tambieva, 2019).

Food Preservation Methods

Karachays and Balkars have well-established preservation methods to save meat, dairy, vegetables and fruits for a long time. Karachays and Balkars stored food and used preservation methods not only for wintertime. They also used them for reducing the volume and weight of stored food for seasonal moving. These methods did not just exist in the past; in fact, these methods are still (or even more) useful now when we can use modern devices. It does not take long to chop, cut, slice and dry fruits and vegetables for their preservation. Moreover, it saves the family budget for electricity and water. It is assumed that incorporating some easy steps to zero-waste at home helps save 50-80 percent of food that otherwise would have been discarded (Recycle Track Systems, n.d.). Practicing methods used by Indigenous communities can be easy; we only need to read and learn about them and share experience.

Джай ишлемеген — кыш гырджынлык
телер (*Djai ishlemegen - kysh gyrdjinlyk teler*)

*Whoever does not work in summer will ask for
flour for bread in winter.*

Karachay and Balkar Proverb

Due to the transhumance method of animal

husbandry, and seasonality, many products were harvested for the future. The most popular methods were:

1. drying meat, sausages, cheeses, cottage cheese, greens and fruits using special technology;
2. salting cheeses, ayran and vegetables;
3. smoking meat and cheese;
4. roasting grains of barley, corn and wheat, which were then ground into a special flour. With less moisture, it was stored longer and weighed less. It also had a particularly appetizing smell. Dishes made from this flour were more satisfying.
5. melting butter (known as ghee);
6. melting trimmings and pieces of fat from the animal carcass. This fat stays safe for months, and can be used for cooking, as well as a base for medicines, balms and ointments.

Long ago, salted ayran, cheeses, and melted and frozen fat were stored in special leather wineskins made from animal skins. Later, clay pots and glass jars replaced them. I remember my grandmother using these methods all summer to prepare fruits, cheese, melted butter, meat and fat. Then, in winter, she took the required amount for cooking dinner. Annya also used woven bags for storing cereals, dried cheeses, vegetables, herbs and seeds. Rice, flour and wheat she bought after the harvest in large quantities for the whole year and stored in large wooden boxes lined with iron, protecting them from insects and rodents.

When my grandparents returned to their native mountains after 14 years of deportation, they found only the ruins of villages. Therefore, they built their house anew not far from a spring with clean water, forest, and alpine meadows. They built the house in a traditionally ergonomic way. The first floor was half-sunk into the ground to keep the cellar and kitchen cool. Thus, products were stored for a long time without refrigerators. Besides saving energy, this is also a way to reduce dependence on electrical companies (Roberts, 2020).

The cellar was divided into two parts: the back part was the deepest and adjacent to the soil, with walls covered by special clay and dried. There, my grandmother kept the harvest of potatoes, carrots and other vegetables in special wooden compartments. The vegetables did not grow moldy in this location. The front side of the cellar was warmer and drier. Here, Sonya (my Annya) kept cheeses, dried herbs, rose hips,

pickled vegetables and jams. Therefore, everything she needed to cook various traditional foods was on the doorstep, literally, and in amounts sufficient to feed grandkids on vacations. Moreover, the menu was balanced, rich in proteins and vitamins. Annya always baked bread herself. On the days she cooked I did not go too far from the kitchen, as it was a pleasure to eat the crust of the bread while it was hot from the oven.

We lived with grands at the village all summer long and returned to city school in September with fresh red cheeks, full of energy and happiness. Moreover, Annya always sent us some cheeses, dried meat and melted butter as goodies for the winter. That significantly reduced the cost of our food in the city. The United States Department of Agriculture (USDA) reports that each year, the average American family of four loses \$1500 to uneaten food (2023). I am sure our knowledge could be useful to help reduce food waste. Modern families have a lot to learn from Indigenous communities. Karachay-Balkar house-holding methods helped my grandparents survive hunger and repression. Moreover, they helped them build life anew and bring up a big family. None of Sonya's descendants ever faced hunger or malnutrition again, thanks to our traditional no-waste lifestyle handed down through generations.

Karachay Balkar Milk Processing Traditions

In ancient times, Karachays and Balkars endowed milk and dairy products with sacred meanings. They called them Ak (White). The spoilage of dairy products was condemned. We had a concept of Ak djiyarga – to prepare dairy products for the winter. Karachay-Balkar Ak products were varied. Several types of ayran (plain yogurt), butter and cheese were prepared not only from cow's milk, but also from sheep's and goat's milk. Households without dairy were considered the poorest. "Ak djiyarga" is a concept that lets people save all milk leftovers for a year or more, with no loss. These methods are still useful for minimizing dairy loss in modern houses.

Агъы бар юйде берекет да бар. (*Akgi bar yude bereket da bar*).

*House with Whites (dairy products) is abundant.
Karachay and Balkar Proverb*

Annya had a separator, which was a massive device to separate milk and cream. Grandma ran it every morning and processed the whole milk, freshly milked from the cows. I remember the times when there were three cows at the farm; I wonder how my grandparents picked them up. One gave very fatty milk, but not so much per day. The other two gave a lot, but there was not as much fat in their milk. Later, at University, I learnt the technology of normalization in a special course. My grands knew it essentially, by national traditions. Following their ancestors' experience and wisdom they always had good fat milk.

By tradition, Sonya prepared dairy products for the coming winter all summer long: ayran, cheese, dried cottage cheese and melted butter. Moreover, she used all the leftovers and in a cold cellar, they were saved for months and years. Annya rolled cottage cheese with a bit of salt into small balls and dried them, so they lost more than half of their weight and volume. Dried cheese is easy to transport, has an intense taste and is rich in protein. The best way to enjoy dried cheese is by pairing it with hot potatoes, bread or rice. Buttermilk obtained from butter production was given to children. This drink consisted of rich vitamins and microelements and was very useful for children and elders. Even colostrum (the first milk of mammals that comes in right after birth) left over from feeding the calf was not wasted. It is very healthy, rich in bioactive compounds: antibodies to fight infections, and promote immunity and growth factors ("Colostrum," 2023). Karachays and Balkars gave it to children to grow their immunity; the remains were used to make special bread and a kind of casserole.

The main leftover widely used in every Karachay and Balkar house is whey. There is a lot for modern citizens to learn about whey, especially around how to use it in the kitchen, and I am sure not many people know what it is. Whey is the liquid remaining after milk has been curdled and strained, and it is rich with proteins, minerals and sugar. According to the Waste and Resources Action Programme report, the United Kingdom disposes of around 95000 tonnes of whey every year (Tolhurst & Fisher, 2019); most of this waste is because people have no clue what to do with

it. Indigenous people's experience and "zero-waste" lifestyle can inspire others. All the methods are easy. First, salted cheese whey is the best brine for cheese storage. Place white cheese (mozzarella or related sorts) in a big jar and put in something heavy to make a press. Then fill it with cold salted whey. This way, cheese can be safe for years, becoming even tastier. Also, this "brine" can be used to save boiled animal carcass leftovers (heads, wrists, buttocks, tongues) for months.

Karachays and Balkars cook several dishes and drinks and knead dough with whey. It makes them tastier and richer in minerals and proteins. There is a recipe for "whey cheese" prepared by bowling whey, separating protein leftovers, and then forming it into cheese. People's memories, written down by ethnographers, indicate it was not their favorite type of cheese, since it is not as tasty as whole milk cheese. But at least it is rich in protein and minerals. Nowadays, it could be a useful recipe for people who prefer to eat low-fat food. My Annya used whey in the most amazing way: to wash dishes, instead of using a dishwasher. Hot, it perfectly dissolves fats and other food residues on dishes, using no chemicals. Just rinse in clear water – plates will sparkle.

As we can see, there is nothing difficult about the Karachay and Balkars methods for making milk products. Using them is easy in a modern kitchen: melt leftover butter, use whey as a brine or dishwasher, or dry cottage cheese. It is truly a "life-hack" that results in zero waste. Meanwhile, dairy leads in food wastage statistics; some surveys show more milk is wasted than meat. According to WRAP research, in the United Kingdom alone, consumers waste 290 000 tonnes of milk a year (2018).

Fruit and Vegetable Handling

Усталыгъы болгъан, ач къалмаз. *Ustalygy Bolgan, ach kalmaz.*

A craftsman (who owns skill) will not remain hungry.

Karachay and Balkar proverb

The Karachays and Balkars highly valued fruits and vegetables. Their processing and preparation were respected skills, and families with various fruits and vegetables were considered prosperous. Less varied and hard to harvest in the mountains, fruits and vegetables were rare and valued. It was a lot of

hard work to grow fruit in the garden, so people used all their experience to save the harvest until the next harvest, which fits modern zero-waste concepts. With modern food-saving technology, it is much easier and cheaper in every private kitchen, and on top of that, it is healthier because these methods do not involve the use of sugar. My grands planted a big garden with fruits and vegetables around their house. Because of the cold weather and glaciers in the mountains, there was not a wide variety of fruits or vegetables. However, they had enough to make a rich and balanced diet, including such fruits and vegetables as potato, carrot, cabbage, beetroots, onion and garlic.

Apple and pear trees, and currant and raspberry bushes in the garden gave a lot to meet our family's needs. After harvest, the fruits were selected and Grandfather put the best ones in special wooden boxes. This kept them fresh for 2–3 months, while the rest were for drying and producing jam. Dried fruits were easy to transport, delicious, and healthy because of their lack of added sugar. A drink with these fruits was considered very healthy, especially for sick children and women after childbirth. Annya cooked a pie with leftover fruits after preparing this drink. Granny also added some cottage cheese, which made pie stuffing tastier and higher in protein. If potatoes sprouted in the spring, they were not thrown away either. Grandfather cut them with a little pulp and planted them on the outskirts of the garden. These beds were dug in the summer for everyday food and were the main crop of varietal potato seeds for harvest in the fall.

Another perfect zero-waste pie is made of beetroot leaves, with a filling rich in fiber and vitamins. One big pie is enough to feed four to five people for dinner. Moreover, leaves are harvested several times during summer, and this does not interfere with a good beet harvest in the fall. This pie is the most famous in the Caucasus, being the brand that is known to represent the region best. The peels of fruits and vegetables were used to feed cows. Potatoes were cooked in their skins and washed well in water. Then people only removed the thin layer of top skin so that less potato is wasted, since 15–20 percent of the potato is removed with the peel; the same applies to carrots and beetroots (Hunter, 2022).

My grandmother also cooked tasty and healthy bean soup in vegetable broth. She did not pour out the water in which the beans were boiled, which helped

the soup turn out very rich and satisfying. Aquafaba is rich in carbohydrates and proteins and increases the benefits and nutritional value of meals (“Aquafaba nutrition,” 2016). Its benefits have become well-known lately. But people who harvested beans knew aquafaba's benefits long before, especially its intense flavor and ability to satisfy hunger. Imagine all the benefits to the food system if knowledge had been learned from Indigenous peoples 10, 20, or 30 years earlier. I am sure there are many cooking techniques that modern people could learn from experienced communities.

New Zealand wastes more than 15 000 tonnes of fruit and vegetable peelings every year (Love Food Hate Waste New Zealand, 2023). This is a loss of healthy food rich in fiber, vitamins, and minerals. Research shows that peels are more nutritious than the pith of plants. This is a significant loss of nutrition not only for people literally starving in countries lacking access to food, but for developed countries as well. Specialists recommend that adults eat 400g of fruits and vegetables per day for a healthy diet (WHO, 2022).

Meanwhile, there are recipes and techniques that let us save peels, aquafaba and leftovers. One can cook tasty food rich in nutrition, and save money, time and resources, including water, electricity and gas. All that is needed is to pay attention to those who have experienced housekeeping in difficult conditions and who are therefore experienced in reasonable economical consumption and respect for their own hard work, and the resources obtained by this work.

Ethics: The Role of the Manner in Zero-Waste

The etiquette of the Karachay and Balkar people was equally important in saving resources. At the same time, prudent consumption lets this community always follow the main ethic code – showing hospitality. Committed to a hardworking lifestyle up the mountain taught Karachay and Balkar people to respect their work and food, which cost them many hours and energy in the fields. Living closely with nature made them respect nature and God generously giving all needs. This affects the life rules of people, their ethics, and proverbs.

Адеби болган къонакъ ашны-сууну зыраф

этмез (*Adebi bolgan konak ashny-suunu zyraf etmez*).

*A well-mannered guest does not waste the food
(eats without leftovers).*

Karachay and Balkar proverb

In addition to the rules for preparing and storing food, the national ethics of Karachays and Balkars have rules for table manners. By how a person followed them, society judged him and his family. A person who did not follow the rules of etiquette was condemned. There are a lot of proverbs about ethics.

Артыкъ уллу къабма, къарылырса. (*Artyk ullu kabma, kyarylyrsa*).

Don't bite too big, you'll choke.

Karachay and Balkar proverb

People were not supposed to stain the table, lips, or clothes with food, crumble bread, casually stack bones on the table, or throw food on the floor. People had to be very careful with their appearance. While preparing food, the number of eaters was strictly counted as one was not supposed to cook excessively. Generally, food moderation was welcomed. Excess and overspending - wasting food - were condemned. A person with bad manners was condemned and not invited to visit; people shunned their company. Violation of etiquette was regarded not only as bad education. More than that, it was regarded as disrespect for the hosts. Karachays and Balkars regarded disrespectful attitude to food, especially to bread, as disrespect for God. Serious cases of spoiling bread could cause serious condemnation.

Тойгъан эшек къышхырын чачыб ашагъанлай.
(*Toygyan eshek kyshkhyryn chachyb ashag'anlay*).

Like a well-fed donkey that eats, scattering bran.

About a sloppy person.

Karachay and Balkar proverb

Vice versa, the prudent and wise use of products and housekeeping were revered. Such families were set as an example and praised, and people would ask for their advice. They were invited to be stewards for big holidays and weddings. It was a manifestation of great honour in the Karachay Balkars communities. It should be noted that Karachays and Balkars have never been greedy. On the contrary, the main and immutable law of the mountain peoples has always been and remains hospitality. The rule is - to share food with neighbors and treat travelers kindly. One should give guests' provisions to take with them

on the road, and the greatest shame and sin is to hide food from the guests. Yes, a hard-working lifestyle up the mountains creates the concept of wise consuming. Centuries of surviving in harsh surroundings create philosophy with respect to food, work, and zero loss.

At the same time, indigenous people know the "Price of bread" and follow hospitality traditions that make people help travelers. So, in the cellar of each family, there was always a "guest share", in case someone came to visit. Our zero-waste lifestyle lets every family, even the poorest ones, store some food for this case. For the Karachay and Balkar people, it is still the same today. My mom has been living in a big city for 50 years by now and she still stores some foods "for guest reasons": cheese, meat in the fridge, salted vegetables, etc. I live in Istanbul and do the same, there is always "something in the cellar" for guests, despite me having no cellar in the apartment.



Чотчаева (Джанибекова) Соня Шамильевна 1920-2003г.

My Annaya (grandmother)

©Mariam Tambieva

Afterword

I've been researching Caucasus cuisine for 7 years. I have been collecting recipes, in conversations with natives' individuals, and diligently recording their memories. I also restore recipes from history books and make photos and videos. All – for the purpose of saving my culture. Wars, deportation, and genocide damaged Karachay-Balkar culture, food systems, animal breeding culture, and architecture. Karachay-Balkar cuisine was independent and self-sufficient; people produced healthy food for themselves and used all products with wisdom. They cook hundreds of dishes, unique and with local products. For now, not a lot of Karachay-Balkar's themselves know and cook more than 10 dishes. It's not even 1% of what our ancestors knew and cooked. For instance, ethnographer Mukhtar Kudaev recalls 12 sorts of cheese and 29 sorts of herbal teas Karachay and Balkar people cooked before (Kudaev, 2011).



*My grandparents with elder kids. During the deportation years in Kirgizstan 1952 year
©Mariam Tambieva*

I was lucky to grow up with my grandparents. They were young enough to survive deportation, and old enough to absorb the national culture. They knew and followed the rules for housekeeping, society ethics, and culture. Grands could raise children and teach them traditional lifestyle. Many people are not as lucky, and a lot of families ceased to exist as all the old people and children died. Thousands of old people left ahead of time, not having a chance to pass on the wisdom accumulated by generations. That's why a lot of Karachay-Balkar's knowledge is under the threat of oblivion.

Therefore, it is so important to record the generations' wisdom, transmitted in the culture and food system of the people before globalization wipes these memories off the face of the earth. While there are still those who remember. It's not only the loss of our history and cuisine that moves me. We have experience through generations in animal breeding, farming, and prudent housekeeping. Respect for hard work and nature, hunger while genocide, bring us to create a very wise food system. Long before the "zero-waste" concept was named. I'm sure, Karachay and Balkars knowledge can be useful for modern people, worldwide. However, to make it possible, we should save our knowledge, write it down, and systematise. We must be heard.

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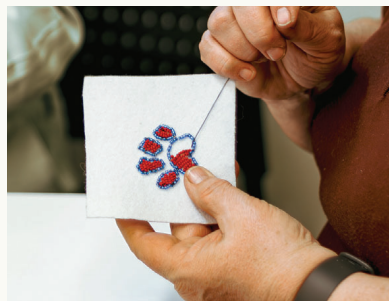
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Karachay

Russia

Central and Eastern Europe

Russian Federation, Central Asia and Transcaucasia

DJERME - OFFAL SAUSAGES BY TRADITIONAL KARACHAY-BALKAR RECIPE

Karachays and Balkars, like all other livestock breeders in the world, use almost everything that an animal could provide for food. Not only meat and fat but also the entrails, hide and wool, horns, and hooves. The most famous of our offal dishes are sohta and djerme.

Sohta is a Caucasian cousin of Scottish haggis, a stomach filled with entrails. Djerme is a sausage. Intestines, caul fat, meat trimmings, rice, and spices rolled up into sheep or cow stomach.

It is a surprisingly healthy dish, rich in protein, vitamins, minerals, and collagen. This is useful for the skin, joints, and blood vessels. Additionally, it is very satisfying and cheap. Djerme remains a traditional meal for the Karachays and Balkars. Moreover, that is a dish for special occasions and holidays, it's served to our most honoured guests.

It is interesting that djerme was prepared by men only. Some families still follow this tradition. Cleaning and scraping the stomach and intestines is dirty and hard work. Therefore, showing care for women, our men have moved these preparations outside the kitchen and women's eyes.

Cooking djerme is not as difficult as it looks. All you need is a bit of rice, spices, trimmings, and carefully scraped stomach, beef, or lamb. Let me share the detailed recipe for djerme, which Karachays and Balkars still follow.

INGREDIENTS

To prepare four medium-sized sausages, you will need

- Lamb tripe - 1 pc
- Small intestine - 2 m
- Large intestine - 1 pc.
- Caul fat - 300-350 gr
- Garlic - 4 tooth
- Rice - 100 gr
- Meat (trimming) - 200 gr,
- Salt - to taste
- Pepper - to taste.

For the sauce:

- Ayran (yogurt) - 200 ml
- Garlic - 1 tooth
- greens - optional
- Salt, pepper - to taste.



Boiled Djerme being cut- ©Photo Mariam Tambieva

STEPS

1. To cook djerme, you will need one sheep set of viscera: tripe, small, and large intestines. The stomach and intestines should be thoroughly rinsed in cold streaming water, scraped until clean, and rinsed again. Nowadays it's much easier – specialized stores sell pre-cleaned offal. All you need is to wash them. In addition, if you want, soak the scraped entrails in ice water for a couple of hours.

2. Meanwhile, prepare the filling. Cut the caul fat and the large intestine into 15-20 cm long strips. Chop the meat into small pieces, any parts of lamb, even trimmings (all that remains from processing the carcass of a ram) will work. Rinse the rice thoroughly in cold water until the water runs clear. Then put in a colander to glass the water. Grind the garlic with a pinch of salt in a mortar, or finely chop it with a knife.

3. When the “stuffing” is ready, cut the prepared tripe into four rectangles about 15 by 20 cm in size. Lay each on the board with the smooth side up. Leave a few cm on the edge closest to you and lay first fat, then pieces of the colon, sprinkling each with rice, garlic, salt, and pepper on strips. Then add the pieces of chopped meat.

4. Bend the edges of the tripe from both ends of the future sausage and, starting from the closest, turn it into a tight roll. To keep its shape, tie the sausage with a small intestine instead of a cooking string. This is an old Karachay-Balkar method for preparing sausages.

5. At this stage, djerme can be preserved by freezing, smoking or salting according to the old method. To salt, carefully rub the sausages with salt and hang them in a ventilated shady place until the djerme is dried. Then, before cooking, just wash it from salt.

6. Fresh djerme cooks this way. Pour cold water into a large pan, add salt and put on a large fire. Bring water to a boil and reduce the heat. Put

sausages into boiling water for 1.5-2 hours. Stir the sausages from time to time, and remove the foam and fat that appears on the surface of the water; otherwise, the look and flavor of the dish will be spoiled.

7. Meanwhile, prepare the traditional sauce - tuzluk, it must be for serving djerme. Beat ayran (plain yogurt) smoothly. Add finely chopped garlic, salt, pepper, and herbs (it could be dill or parsley). Mix well and leave it for 20 minutes. The sauce is ready.

8. Take djerme out of the water, and let them drain. Anciently, the broth was also served in a separate bowl. Now we don't do that, only a rare gourmet dares to taste this rich fatty broth.

9. Before serving sausages, we can cut them into rounds. Fry them in a dry pan until golden for a more appetizing look and intense taste. Serve djerme hot with potatoes, bread, and vegetables. For the best taste, deep every hot piece into a spicy sauce tuzluk.

10. Bon appetit!



Djerme served with sauce- ©Photo Mariam Tambieva

Latin America



Mochilas Wayuu Photo©Dayanna Palmer

Rosa Marina Flores Cruz

*Afrobinniza from the Isthmus of Tehuantepec
Mexico
Latin America*

WIND FARMS, ACCESS TO LAND AND TERRITORIAL DEFENCE IN THE ISTHMUS OF TEHUANTEPEC

"We name this struggle as ours because we are aware that in defending the land we defend life, and that demands for access to the land and the rights we have over it guarantee the sustenance of our entire community."

Introduction

I was born and raised in Juchitán de Zaragoza, Oaxaca, a Binnizá community located in the south of the state of Oaxaca, in the regional area known as the Isthmus of Tehuantepec. The Binnizá people live in the coastal plain area of the region. In our food, in our clothing, in the melody of the language, our identity as an Indigenous People marks the way in which we relate to our ancestors, to our territory and to the rest of the world.

When I left my region to study a degree in Environmental Sciences, and later a master's degree in Rural Development, the differences between my family's way of life and those of my peers who did not belong to an Indigenous community became clearer to me. The ritual practices, the food, the clothing, the ways of celebrating, the knowledge taught by my grandmother – there were so many things that were different in my way of seeing and living life. But in the academy these differences do not matter; in Western education I acquired knowledge mostly from people who did not share my experiences. Everything came from Western science, from what great white thinkers wrote and was then read and interpreted by other great white thinkers. If Indigenous peoples were mentioned, their existence could not be separated from the analysis of environmental problems; our ways of existing were part of the complex to be studied.

What does all this have to do with this article, in which I intend to talk about the importance of the collective possession of land for the defence of the territory? Knowledge Makers gives me the opportunity to ask myself how Indigenous women can build their own

methodologies to approach the study of reality; this allows me to open a new door to reflections on how Indigenous communities do science, and the importance of writing the stories about what happens in our territories in our own words.

In the Isthmus of Tehuantepec, the concentration of wind farms is an example of the serious consequences for the lives of communities resulting from sustainable development based on maintaining industrialization and the extractive industry's practices. The objective of these projects has been to guarantee the continuity of the capitalist accumulation model, and not to contribute to climate change mitigation.

In these cases, decision-making about what to do with our territories is left in the hands of outsiders and responds to market interests and political agreements (Flores-Cruz, 2015). The importance of community life, ancestral knowledge and the spirituality of our peoples are seen as secondary elements, while for those of us who live in this territory, they are central to our lives.

The arrival of the wind farms was full of such big words as "progress," "development," and "opportunities" (Sandoval, 2015; Flores-Cruz, 2015), linked to the discourse of environmental co-responsibility in the face of climate change. Our territory was given the mission of contributing to the achievement of international climate change mitigation goals signed by the Mexican government (Flores-Cruz, 2020), without even considering the energy needs of our region or the impacts of climate change on our communities.

Mitigation policies opened a space of opportunity for private companies to implement harmful projects in our territories, but with a green face (Moreno,

2012). Based on lived experience in my community over 10 years of denunciation of, and resistance to, the greenwashing of wind farms, in this text I reflect on the importance of the struggle for agrarian rights for the defence of territory in the face of megaprojects of dispossession, especially for Indigenous women.

Land and Territory As Claims of Struggle

The Isthmus of Tehuantepec region is in southern Mexico, between the states of Oaxaca and Veracruz. It is geographically divided into two sub-regions: the Isthmus of Veracruz to the north and the Isthmus of Oaxaca to the south; the southern part is inhabited by five of the 16 Indigenous Peoples of the state, the Ikoots, Binnizá, Zoques, Chontales and Mixes. Our region is characterized for being the narrowest part of the Mexican Republic (not counting the peninsulas), with a length of 205 km that separates the Pacific and Atlantic Oceans. This gives it great geopolitical importance and makes it a privileged region in the articulation of the country to the so-called Economic Basins of the Pacific and Atlantic.

Like other Indigenous Peoples, the Binnizá who inhabit this area understand territory beyond the private possession of land. For the Binnizá in the south of the Isthmus of Tehuantepec, our rituality includes long walks to the shores of Laguna Superior, a salted lake that separates our beaches from the Pacific Ocean, where we share collective meals at worship sites that have belonged to our people for centuries. Collective practices and rituals are part of territorialization, resulting in rootedness and belonging (Gimenez, 2000); therefore, if something affects the land, (for example, if the roads were to be closed), a fundamental part of who we are would come to an end.

The territory is the space in which our cosmology is manifested, where historicity and collective memory come together. In the case of the Isthmus and the wind farms, many of the solutions proposed for the communities were reduced to monetary exchange (Flores-Cruz, 2015), highlighting the colonialist and capitalist character of the development model of these renewable projects. To understand the claims behind the struggles around these projects, it is important to recognize the territory beyond the spatial framework, as a geographical scenario of social life: "it becomes a fundamental part of social cohesion, solidarity and integration of rural communities, it is presented as a screen on which communities project their imaginary, their values and their identity" (Giménez, 2000, p. 95).

Feelings of attachment, rootedness and socio-territorial belonging are generated (Giménez, 2000), which are present in every stone, tree, river or road. By managing and making our own the different biophysical parts that make up our territory (hills, bodies of water, vegetation, fauna), we appropriate it, we make it our own socially, culturally, politically and religiously, in addition to establishing borders and hierarchical relationships with other territories (Giménez, 2000).

This constitutes a difference between the vision of land possession in monetary terms and that linked to territorial ownership (Giménez, 2000). One perspective seeks the reproduction of community life from a symbolic-cultural perspective, and the other is more utilitarian-functional, where land is assumed as a resource. This is illustrated in the dispute over territory in the Isthmus of Tehuantepec where, on the one hand, through the greenwashing of wind energy projects, the land is transformed into an avenue for capital; and, on the other hand, the communities demand and claim their rights to self-determination and territorial sovereignty.

The land is part of the territory; it is a common space, a living space where the community materializes what makes us the Binnizá people, a life linked to local native corn (xhuuba'huiini), tomatoes, shrimp and fish. The right of access to land is a powerful tool to vindicate the right to autonomy and self-determination, to allow the protection and management of the territory to belong to those of us who live and sustain our communal and collective life in it. For this reason, it is important to talk about access to land and the guarantees that we as Indigenous Peoples have with respect to it.

In Mexico, 80 percent of the land is collectively owned, that is, decisions regarding its use must be made through an assembly rather than individually. This characteristic has been an obstacle for the implementation of several extractive projects; therefore, the collective possession of land in "ejidos" (communal land) and "communities" is a fundamental part of the defence of territory for Indigenous and peasant movements.

Women's Access to Land in Mexico

After the 1910 Revolution, the distribution of land through the Ejido and Bienes Comunales guaranteed access to land for thousands of peasants and Indigenous people (mainly men) throughout the country (Baitenmann, 2020). However, the idea of the agrarian distribution was to guarantee the support of rural families in Mexico, based on the conception of the traditional family (Judeo-Christian), where the man is the one who

provides and protects.

It took 50 years from its decree for the Procuraduría Agraria (Office of Agrarian Affairs) to establish in 1971 that women could be agrarian subjects and participate in the ejido and communal goods, without jeopardizing their rights by changing their marital status. Males have been the main subjects of agrarian law based on the patriarchal logic of heads of household and the division of labor by gender, fundamentally in the countryside (Almeida, 2012). The agrarian assemblies, both of communal properties and ejidos, are almost entirely made up of men, most of them older, considering that the first registers were created in the mid-twentieth century. This situation has not changed over time; few women appear on the lists of communal and ejido members, and even fewer occupy representative positions.

According to Almeida's report, women's agrarian property rights were limited to the possession of a plot of land for housing and the possibility of participating in an organizational structure created to integrate them: the Women's Agrarian and Industrial Units (UAIM). To have access to this form of collective ownership, women do not need to be ejidatarías or comuneras, but the final decision is made by the ejidal or communal assembly (composed mainly of men).

This situation has limited women's legal ownership of land up to the present day. Despite the fact that in 1992 the Agrarian Law established the creation of the UAIM to ensure women a space to start a productive project, according to the National Agrarian Registry (RAN) data, in 2021 only 3.3 percent of the ejidos and communities have these units constituted in the agrarian nucleus at the national level (1046 ejidos and only four communities).

In 2017 only 2.5 percent of the agrarian representations (both communal property and ejidos) were headed by women. Women are excluded from decision-making regarding land, despite being the

ones who sustain much of the work of protecting the territory, in addition to the care and upbringing tasks derived from family and community life. Ejido and communal rights are flawed from their origin, which hinders their access for Indigenous Peoples in general and for Indigenous women in particular, especially due to bureaucracy, institutional centralization and even language access, since in the state of Oaxaca women represent the highest percentage of speakers of Indigenous languages. There is structural violence in agrarian institutions that keep women away from decision-making; in many assemblies they are denied a voice to intervene, even though they have agrarian rights. The exclusion of women and young people from access to agrarian rights is linked to the processes of land privatization

and the introduction of large megaprojects in different Indigenous territories.

Decisions on land use and management, as well as the signing of contracts with private companies (many of them for 60 years, as in the case of the Isthmus and the wind farms), are almost exclusively in the hands of older men, who do not always consider the needs of all members of the community. While, as Indigenous Peoples, we understand the importance and wisdom that older men bring to the guardianship of the knowledge and practices of our people, we can-

“The territory is the space in which our cosmovision is manifested, where historicity and collective memory come together.”

- Rosa Marina Florez Cruz

not lose sight of the fact that our peoples have lived through 500 years of colonization based on Catholic and patriarchal Christian logic (Galeano, 2004). The fact that only older men have rights over the management of the territory weakens many elements of community life, concentrates decision-making in a single sector and isolates the rest of the population.

The fact that women are organizing to demand access to, and ownership of, agrarian rights is a direct action in defence of the territory and community life. Access to land guarantees food for other generations, for children and grandchildren, and guarantees the maintenance of the relationship we as Binnizá people have with nature, with the sea and the wind.

Living Among Windmills

In Mexico, the history of renewable energies goes hand in hand with colonial practices of dispossession and violation of the land rights of Indigenous Peoples (Flores-Cruz, 2020). In the Isthmus of Tehuantepec, the Indigenous Peoples who inhabit the region have lived for more than a decade with the consequences of the imposition of this model.

While for large investors and the government wind energy has become a symbol of the ideal of “sustainable” development (Flores-Cruz, 2020), for many Indigenous Peoples of the region, the installation of more than 2000 wind turbines, producing 62 percent of the wind energy of the entire country (Zavala, 2020), has strongly impacted the dynamics of daily life. The installation of mega-projects and the privatization of lands have been based on legal irregularities to obtain possession of collective lands, as well as permits for the generation, transmission and commercialization of energy (Flores-Cruz, 2020).

In the Isthmus, wind energy has become a symbol of the ideal of “sustainable” development in local, state and federal government administrations, becoming the banner to talk about development and investment for environmental mitigation. In return, ecosystems and life in the region suffer a series of impacts, including the following (Flores-Cruz, 2015):

- Occupation of the territory. The lands are passed to the private control of renewable energy production companies.
- Limitations on the use of formerly collective

roads. Roads are fenced to control the passage of authorized personnel.

- Increased violence and corruption of community authorities. Many companies approach organized crime to obtain private security, and also become linked to political actors through agreements and support for social responsibility programs.

- Polarization and rupture of the social fabric in the communities. The disparity in the distribution of economic profits among “developers,” landowners, company workers and the rest of the population that does not receive direct benefits or that is part of territorial defence processes has created dynamics of tension between those in favor of the projects and those against.

- The lack of benefits for the communities with respect to the energy produced in the parks. Several communities are resisting and denouncing the high electricity rates charged in the region.

- Increased prostitution and violence. This is caused by a large number of workers (mostly male) from outside the region and by the association of the companies with organized crime groups for their protection.

- Landscape transformation, due to the change of vocation from agricultural to industrial land.

- Bird collisions with wind turbines.

The arrival of this large green capital investment to the Isthmus responds to a series of international agreements signed over the last 30 years, such as those which set the rules for current infrastructure projects in sustainable development and renewable energy in the country.

In 1989, the Washington Consensus established political-economic measures, with respect to which certain Washington-based institutions (the International Monetary Fund [IMF], the World Bank [WB], the United States of America government and the Federal Reserve) would contribute to stabilizing and adjusting the economies of the countries of the South of the American continent, in the face of the external debt crisis outbreak (Bidaurratzaga, 2012). In practice, these policies do not reflect the objective of improving the population’s access to renewable technologies or to the energy produced by them in order to have an impact on current lifestyles and production, which are

highly dependent on fossil fuels. The protocols approved to establish mitigation mechanisms are aimed at stimulating international cooperation for sustainable development (Gasparello, 2020; Vidal-Martínez & Flores-Cruz, 2023).

The Mexican government created the conditions for 29 wind renewable energy generation parks to be installed in the region (Flores-Cruz, 2015):

- 20 belong to Spanish companies (Preneal, Acciona, Gamesa, Gas Natural, Renovalia Energy, EYRA, Acciona, Peñoles and Iberdrola);
- 3 belong to French companies (EDF);
- 1 belongs to an Italian company (ENEL);
- 1 belongs to the United States (City Express); and
- 2 belong to Mexican institutions: the smaller one, with 21.9 GWh/year and three wind turbines, is for research purposes at the Instituto de Investigaciones Eléctricas; and a wind farm with five wind turbines (42.05 GWh/year) will supply energy to different military camps and buildings of SEDENA.

In this way, the wind has been transformed into a commodity, a means for the exploitation of the territory, losing its character as another element in the shaping of the landscape and the scenery of life for our people. Even the knowledge and language of our people has been employed symbolically by wind companies; the name given to the wind farm of Gas Natural Fenosa (of the Spanish energy multinational Iberdrola), Bii Hioxho, is one example. “Bii’ Yoxho” in Didxazá, the language of the Binnizá people, are the words used to refer to the wind that blows from the north, a strong and harsh wind that can reach up to 170 km/h (80 mph). These air currents arrive to the region in the winter; their presence is part of the cosmovision and relationship with the territory of the Zapotec people of the coastal plain.

As if this were not enough, the concept of “Bii” has been simply translated by companies as “wind,” but for us, Bii is not only the air. It is also the breath that gives life to the body, because that is what air is to our peoples: it surrounds us on the outside, it shapes the sea, the sand and the plain, it makes the

trees bend and calls the shrimp to the shore and it also gives us breath and life. Companies use our words to name their projects, register them as their own and use them, disregarding their depth of meaning and turning them into a showcase of their interests. They simplify Indigenous thought and turn it into a useful object to gain acceptance among the population.

Binnizá Women, Guardians of Territory

As I mentioned in the section on territory, land appropriation and management practices are fundamental in the construction of community life, rootedness and territorial identity (Giménez, 2000). These activities are not limited to productivity and land use, which are commonly assigned to male work roles and guaranteed by access to land.

Women’s participation in the appropriation of the territory is not limited to the production and use of the land. Although they do not have legal ownership of the land, in the Isthmus, women sustain the food production chain through marketing, cooking and the transmission of knowledge (Ramos & Schenerock, 2020). However, during the signing of contracts with the wind farms, women were displaced from decision-making processes and were only involved in the ownership of the land (Flores-Cruz, 2020).

As part of their strategy to set up wind mega-projects, these initiatives discursively manage a message of prosperity and environmental care, while at the same time, they are driven by the same logic of maximizing economic benefits at the expense of sacrifice zones, similar to large extractive projects. Thus, the green industrialization of the region has transformed our local economic system, which was traditionally based on the commercialization of food products obtained from planting and fishing, and it is women who control and manage these important aspects of the local economy. These projects impact Binnizá women in a different way than the rest of the population. The decrease in sowing, and the change from productive agricultural or fishing work to salaried and service work, damages family economic dynamics and concentrates the support of the household on the salary of the male; this is even before considering other implications that the large migration of men, destined to be cheap labor, has on the communities (especially the increase in prostitu-

tion and sexual violence).

The impacts on women are not exclusive to this form of green industrial development. Fossil energy projects, mining, gas pipelines, hydroelectric plants, monoculture plantations and other expansive models are recognized as generating impacts on health, emotionality, fear, uprooting, dispossession, loss of collectivity and the local economy (Ramos & Schenerock, 2020).

Added to this is the economic and food colonization which has transformed our way of life, a consequence of efforts to make the area more comfortable for the high-level workers (many of them foreigners) who have come to settle in the city. As a result, we have seen an influx of self-service stores that supply us with industrial and imported processed food, which rivals and displaces the local food that is still produced in the region. This is in addition to the impacts on our people's food supply and the loss of community and collective social ties created in the local market.

Women were almost completely displaced from the agreements and signing of lease contracts with the wind energy companies. They were isolated from decision-making because very few had the status of being possessors of the land; persuasive efforts were instead focused on men. Techniques used by the companies to convince the men even reached the point of hiring young women as hostesses to visit landowners and ensure the signing of contracts (Flores-Cruz, 2015; Sandoval, 2015).

For all these reasons, it is essential to demand access to land rights for women, and their participation in town councils and decision-making spaces. The institutionalization promoted by the Agrarian Reform and, subsequently, the dispossession strategies employed by wind power companies have generated a scenario of vulnerability for collective lands.

Final Considerations

in the Isthmus of Tehuantepec, the Binnizá people are defending their territory against the megaprojects of renewable energy generation. We regard the land and the territory not as objects with an assigned monetary value, but as a complex in which

our lives are linked not only to the physical but also to the spiritual aspect, to community dynamics, food, language and clothing.

Although territory is not only about owning a piece of land, when an industrial or infrastructure development project threatens a village, land ownership and land guarantees become a particular tool for the defence of life. In the Isthmus of Tehuantepec, during the occupation of our Indigenous lands by wind farms for more than 10 years, the possession of the land and the concentration of decisions about it in the hands of men facilitated the processes of dispossession.

The impacts of the installation of these projects are experienced in different ways; there have been specific benefits for particular sectors and this has generated tension in the communities and among the population. For Indigenous women, these impacts are added to the patriarchal dynamics that we must deal with daily.

It was not the wind projects that generated our exclusion from decision-making and land ownership rights; rather, it was the patriarchal scheme already established during land distribution, but the companies that settled in the region benefited from this situation. In addition, they used women's bodies as part of the offer of mercantile exchange to obtain the land. But in response, from the beginning we Indigenous women have been involved in the defence of the territory.

We name this struggle as ours because we are aware that in defending the land we defend life, and that demands for access to the land and the rights we have over it guarantee the sustenance of our entire community.

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Rosa Marina Flores Cruz- ©Photo Rosa Marina Flores Cruz

Dayanna Palmar Uriana

Wayuu
Venezuela
Latin America

THE PROTECTION OF THE WAYUU TERRITORY IS THE PROTECTION OF THE WEAVING OF OUR LIFE

The identity of Wayuu people is hidden in the Wayuu women. We give birth to our children, we inhabit our territory, we cook our traditional food and we know the ways of our craft. Wayuu women are the walking territory of our culture.

Together with our land, we are one.

Acknowledgement

I would like to thank my Wayuu family and my ancestors before me. They not only make my life possible, but also, they guide my purpose in life. Thanks to my mother and father, my uncle and my aunt, my siblings, my grandmother Rosario and my brother Jonathan. Special thanks to the Knowledge Makers team for uniting Indigenous women's voices

Introduction

As an Indigenous Wayuu researcher, I wrote this article with the aim of analyzing the impact of the economic exploitation in La Guajira regarding coal mining and the new project of wind farms in our territory. Additionally, I explore the impact of this exploitation on cultural and traditional practices and preservation of ecosystems. Before doing this, it is important to understand some aspects of the Wayuu cosmology of life. Our beliefs are based in the spiritual world and everything that surrounds our territory has a purpose. Our territory is not only physical; the vision of the Territory of La Guajira is a biocultural environment to which physical and spiritual beings conform. This knowledge encompasses the dynamics that exist between territory and its biological and spiritual wealth, and is immersed in the memory of the Wayuu, who have transmitted it from generation to generation.

The dynamics of this knowledge create the balance that exists in La Guajira and the conservation of our desert, rivers and beaches. I share this as it is important to understand that for Wayuu people, the land is not just for exploitation or use it is where the spirits are, and it acts as a messenger between the spirits and the Wayuu people. It is impossible to understand why our territory is sacred and how it enables our connection with the living beings and natural resources without taking into consideration our cosmology and ways of life.

This research addresses the economic exploitation of Indigenous territory and the misconception that generating clean energy is better for Indigenous Peoples. Current economic and environmental models do not take into consideration Wayuu rights to self-determination, which causes serious damage to our culture and ways of life. I explore this issue through conversations with Wayuu authorities and experts. Wayuu knowledge is shared through oral traditions; this paper intentionally continues this practice and aligns with other Indigenous research methods (Drawson et al., 2017; Chilisia, 2019; Wilson, 2020) by centering Wayuu people's voices. I use these methods to explore how coal mining and wind farms are tools used by State and private industries to gain profits at the expense of Wayuu land. These oral stories are also presented alongside research papers about the economic exploitation of Indigenous territory, news articles about wind farms and coal mining in La Guajira, and literature about the history of the Wayuu people.

Wayuu People

The Wayuu people live in La Guajira, the name of our ancestral territory. We have survived the process of Spanish colonization and the constitution of the Venezuelan and Colombian States, all of which brought in new laws for the conception of our territory. We know how to survive in our territory, land of scorching sun, infertile sands and dry winds. We are desert people, resilient and brave. Our territory is located at the north of the border between Venezuela and Colombia. We are the largest Indigenous community that exists in both countries. The word Wayuu is used by Wayuu people and translates to “person” in general, Indigenous of the own ethnicity and also, the couple (husband or wife). According to the Census of the National Administrative Department of Statistics, in Colombia there are 380 460 people self-recognized as Wayuu (DANE, 2019), while in Venezuela the population of this Indigenous group is 413 437 (Eastview Information Services, 2024). Even though Wayuu people are the largest Indigenous population in both Venezuela and Colombia, there is a humanitarian emergency in our territory: lack of water, threats to our livelihoods and scarcity of food. In Colombia, the Wayuu children face serious risk of dying from malnutrition, according to the National Court (“ABC to Catch Up on the Humanitarian Crisis in La Guajira,” n.d.).

Experts like anthropologist Sebastian Vargas (2023) and several human rights defenders agree that La Guajira as a Wayuu territory and nation has been outside the plan of the Republic. The Indigenous territory has not been part of the administrative, social and political project of the State. La Guajira has remained isolated and the Wayuu survive in a state of humanitarian emergency. In colonial times it was called a “land of savages”, and that perception is still maintained; it is a land that both countries, Venezuela and Colombia, have forgotten in their obligation to fulfill human rights.

There is a Complex Humanitarian Emergency existing for Wayuu people on the Venezuelan side: the fall of the democratic institutional framework in Venezuela has led to the collapse of institutions, resulting in a severe lack of health, food and education services. In this context, the Wayuu people

have been one of the most affected populations at a humanitarian, economic and social level. Communities have suffered long periods, three months or more, without water. Eighty percent of the inhabitants of La Guajira in Venezuela do not have jobs and, according to data from the ENCOVI 2021 pollster, 98 percent of the population is in poverty and 86 percent is in extreme poverty (Bacca & Palmar, 2023). On the Colombian side, the reality is no different. The Constitutional Court of Colombia, through ruling T-302 of 2017, declared the State of Things Unconstitutional in La Guajira. For the Court, the structural and systemic violation of the human rights of the Wayuu people was evident in action or omission of the Colombian State in matters related to drinking water, food and health services, among others, to the point of putting into question the physical and cultural survival of the Wayuu (Bacca & Palmar, 2023).

Malnutrition caused the death of at least 308 children under the age of five in Colombia during 2022, the highest number of cases registered in the last five years, according to the Ombudsman’s Office. Many of the child deaths are reported in La Guajira, in the north of the country, and in Chocó, in the west. They are the two of the poorest departments in Colombia. In 2022, the Constitutional Court announced that 39 Wayuu children have died from causes associated with malnutrition in La Guajira (“Some 39 Wayúu Children Have Died in 2022 from Causes Associated with Malnutrition”, 2022).

The Cosmology of The Wayuu People

The cosmology of the Wayuu people is based on ancestors, weaving and dreams. Our physical weaving practices reflect our cosmology in its patterns and technique. The weaving technique that is used is circular, because the life of the Wayuu is circular; each thread symbolizes the connection between the spiritual world and the physical world, and the way Wayuu families are tied with our ancestors and Maleiwa (God). The name of the Wayuu weaving is Susuu, and it is a special gift for family and loved ones. Weaving is very special because it is an inheritance from our ancestors, and it is a way for Wayuu women to express life as we feel it and to construct dreams in reality. Our weaving shows

the importance of intergenerational knowledge-sharing and connection between our people and the land. Additionally, our weaving reflects how we understand the world. Our world is connected, it is circular, and it is intergenerational.



Mochilas Wayuu- ©Photo Dayanna Palmar Uriana

As an Indigenous territory, La Guajira is connected with physical and spiritual practices. Each family has their own tomb to honor their ancestors, a group of animals to graze, a house, and a portion of the land. The land is an inheritance from the forefathers. The ownership of the land does not only serve an economic purpose but is a spiritual connection. This is important in understanding the dynamics of agreements and distribution of the portions of land in La Guajira, because every Wayuu family has self-determination over their territory. Discussions about the use of the land must be conducted with the leader of each family; it is not about a unique agreement with one authority. To conduct projects in La Guajira territory, prior consultation must be held with all the families.

Economic Projects in Wayuu Territory

Economic projects of coal mining have changed the ecosystem, and we have denounced coal mining due to the myriad of environmental harms it causes, such as water contamination and damaged pastures. The construction of industrial wind farms is another proposed energy solution, but it would drastically change land use in Wayuu territory as they require large plots of land that cross our sacred spaces. The weaving of the Wayuu

life is at risk, and the connection with the spiritual world and physical ways of life are in danger if these projects continue without protecting our rights over the land and our right to self-determination.

The States have to guarantee the right to prior consultation, since there are several instruments for the protection of Indigenous People; for example, the United Nations Declaration on the Rights of Indigenous People recognizes our right to self-government and by virtue, the right to freely determine our political status and pursue our economic, social and cultural development. Economic projects in our territory must be accepted by the community. To not do so is to breach the UN Declaration on the Rights of Indigenous Peoples (Office of the High Commissioner for Human Rights, 2007).

Indigenous ownership over the land in Colombia is not total, even when there is a historic legal framework to respect Indigenous territory. The Colombian State created Indigenous reservations as the collective property of the Indigenous communities in articles 63 and 329 of the Political Constitution (1991). However, for reasons related to economic interest, Indigenous land is usually exploited for resource extraction and other major development projects; this is one of the most significant abuses of the rights of Indigenous people, and it has been denounced by the Special Procedures of United Nations (Office of the High Commissioner of Human Rights, 2011)

Despite its prominence in international law, the right of Indigenous peoples to freely utilize their natural wealth and resources, sometimes labeled as economic or natural resource self-determination, has been remarkably inconsistent in its application. This may be explained by the conflation of two distinct topics: the human right to self-determination and the principle of state sovereignty (Cambou & Smis, 2013).

Economic projects of the Colombian State are a threat to the survival of Indigenous people. In Colombia, exploitation of the land has been a long-time battle for Indigenous people because such processes lead Indigenous Peoples to poverty and conflict. One example is the ongoing 20-year legal battle of the U'wa people against the Colombian government

for the protection of their land. The exploitation of their land has brought the U'wa conflict, terrorism attacks and spread of sickness. Natural resources such as gold, wood, coal and oil are found in Indigenous territory.

Projects organized by the State and private companies are often implemented in Indigenous territory and they generate a lot of profit for the actors involved, but not for Indigenous people. Conflict and violence also occur when control of the land and natural resources is seized by illegal armed groups. Colombia has difficulty governing mining and its deleterious harmful effects, including its links with social and armed conflict dynamics (Arbeláez-Ruiz, 2022). The exploitation of Indigenous land is a regular practice of the Colombian State. This emphasizes that the current coal mining and wind power activities in Wayuu territory are part of a longer battle between people who exploit our Indigenous territories to enrich themselves, and our own people who wish to maintain our cultural practices.



Wayuu women and weaving material- ©Photo Dayanna Palmar Uriana

In this article, I will analyze the impact of the economic exploitation in La Guajira in Colombia related to coal mining and the new project of wind farming in the territory, and their impact on cultural and traditional practices and the preservation of ecosystems. The transition to clean energy and the phasing out of fossil fuels have been portrayed as reconciliation with Indigenous groups. For example, communities in Canada have embraced renewable energy to create jobs (McDiarmid, 2017). But the massive demand for renewable energy may bring new problems for the

communities, given the amount of land required for project development. The impact of these projects is still unknown. These projects need to evaluate the change in the ecosystem and must include Indigenous knowledge perspectives and economic participation.

Correjón Mine

La Guajira is a desert territory very rich in coal. Three decades ago, the Colombian State started a mining project in the south of La Guajira, the location of the biggest coal mine in Latin America which extends over 69 000 hectares (ACO Iberia & South America, 2020). The mine, called Correjón, produces more than 30 million tons of coal each year and its impacts include large earth excavations, deforestation in the area where it is located, problems with water sources, and air pollution due to coal dust. It has also been involved, since its foundation, in tensions and problems with Indigenous communities for violating their rights ("The Gigantic Correjón Coal Mine, Denounced for Violating Human and Environmental Rights," 2021).

The mining operation ends with the extracted coal being loaded onto a railway owned by Correjón that has approximately 120 wagons and makes nine daily trips. The company extracts about 108 000 tons of coal every day to load at the Puerto Bolívar coal dock, which receives ships of up to 180 000 tons and exports it to other countries. In 2020 it exported 13.6 million tons of coal ("The Gigantic Correjón Coal Mine, Denounced for Violating Human and Environmental Rights," 2021). According to data from the Ministry of Commerce, Industry and Tourism, the department's mineral exports reached \$793.9 million dollars annually, before the pandemic ("Correjón Lost 759 Million Dollars Due to Worker Strikes and Pandemic," 2020).

Mines And Its Impacts on Our Tombs (Sacred Sites)

The installment of these large mines has caused serious consequences for the sacred sites of Wayuu People and for the ecosystem. First, I will explain the effects on sacred sites (tombs) and why they are considered sacred.

Wayuu cosmovision is based on the spiritual world and everything that surrounds our territory has a purpose. Our territory is not only physical; the vision of the territory of La Guajira is a biocultural environment conformed to by physical beings and spiritual beings. The ancestors are sacred, and they guide the path of the living family and future generations through messages in dreams. According to the Institute of Cultural Heritage, (IPC), for Wayuu people, “death does not mean the end of a cycle but rather it is a step for the progressive transformation of the soul. When a Wayuu dies, two wakes are held in their honor, each of different significance and which imply a kind of interaction with the mortal remains of the deceased” (as cited in Institutional Assets and Monuments of Venezuela, n.d.). Within the cosmogony of the Wayuu people, death is the journey of the soul to the land of the dead (Jepirra), says Wayuu anthropologist Weilder Guerra (as cited in Institutional Assets and Monuments of Venezuela, n.d.).

Jepirra is a place where the souls of the dead gather. It is in North Guajira, a place that is beyond the sea, where the deceased will find themselves with all their family members that have died and with the animals that have died, according to Wayuu authorities (Institutional Assets and Monuments of Venezuela, n.d.). When a Wayuu Indigenous person dies, they are left at home and laid in a hammock where their body is covered with a white sheet; this is done so that the deceased collects the steps they left in life. The body should not be left alone but should always be surrounded by people (Asawaa ORG, 2020).

The passing of our dear ones means gathering for all the family. After the burial, the guests and relatives eat lamb and beef, talk, have traditional liquor and play. We offer good attention to our guests in the form of gratitude and reciprocity for their company. We do this since we consider it necessary for the deceased to occupy a privileged place in Jepirra. The second wake occurs years after the first burial of the deceased. This is the last farewell to the deceased. After approximately twelve or fifteen years have passed, the remains are exhumed. We go to the graves and one person from the family is chosen to collect the remains of the deceased and clean them well to deposit them in an ossuary. This is symbolic since the soul leaves where Ma'leiwa is: God and creator of all that exists. The relatives prepare the wake in a very similar

way to the first, although even better attention will be paid, since it will be the last farewell.

Since the Cerrejón mine's inauguration, Wayuu people have reported the desecration of sacred sites. The communities surrounding the Puerto Bolívar coal dock, which receives ships to export coal to other countries, denounced the removal of graves for the enterprise at the beginning of its operation. These graves were very old, and human remains were still kept in jars, as in ancient times. In my conversation with the Wayuu families of Orookot, they told me there was no dialogue or prior consultation; the mine just commanded Wayuu families to remove their family graves in exchange for money or food and beverages to “not disturb the spirits” (personal communication with Aleida Tiller, Wayuu authority of the Orookot community and sociologist, March 23, 2023). The graves were removed and now they are an easement pass where a train works.

At the beginning of this article, I explored the Wayuu vision of the weaving of life. If we return to the weaving, our grieving practices are one of the threads that make us who we are. If this thread is missing or severed, we cannot complete the weaving that symbolizes the continuity of our cultural practices. Exploitation of our land that disrupts our cultural practices jeopardizes not just our ability to bid our family members farewell, but also our ability to be Wayuu; land exploitation disrupts the weaving.

Cerrejón's Continued Consequences

Cerrejón's impacts go beyond the gravesites; the railway continues to have negative impacts on the community. Aleida Tiller, Wayuu traditional authority and sociologist (personal communication, March 23, 2023), lives 500 meters from the railway line in the community of Orookot. She says that she does not know a quiet night, because the train is always working, always noisy. It is not only a source of noise, but also of danger and violence, because there have been attacks by illegal armed groups in Colombia, like the Revolutionary Armed Forces of Colombia (FARC), who blew up the railway with dynamite in 2012 (Associated Press, 2012). The attack caused deep fear in Wayuu communities, since it could happen again in the context of the armed conflict in Colombia. The violence of illegal armed groups in Colombia historically has affected the Indigenous

people. Many Indigenous Peoples in the country continue to struggle with forced displacement due to the violence and terrorism attacks resulting from the long-term armed conflict in Colombia. Some of them have been declared to be at the border of cultural extinction (Awá, Kofán, Siona, Páez, Coreguaje, Carijona, Guayabero, Muinane-Bora, Pastos, Embera and Wito-to) (Mendoza, 2022).

Another consequence to the Wayuu ecosystem is the running over of animals. Many of the families that live around the railway line have lost animals, the main livelihood of the Wayuu, due to accidents on the railway. The Wayuu do not go after the animals, but instead let them graze. When the operation began the reports were higher; dozens of animals were reported dead. It was not until 2009 that Cerrejón began to repair the damage caused to Wayuu families by the activity of the coal train. Aleida Tiller (2023) also says that the mine is a source of contamination of the water sources where the animals drink. Although Cerrejón says that the coal has a sealant and it does not generate dust, the truth is that charcoal always surrounds the Jagüeyes, lagoons located in the desert that receive this name in Wayuunaiki. The air is contaminated; so is the water.

Cerrejón has affected our relationship with our territory. Our ancestors have been removed from their resting place and the constant noise of the train is not peaceful for their spirits. The treatment of the Wayuu families has been disrespectful. As for the physical world, our water has been contaminated. There is a source of blackness as charcoal is dropped in the Jagüeyes and the animals can no longer have clean water. The peaceful way of life of the Wayuu people has changed, and so has the weaving of our life. In our cosmology, we are united by the circle of weaving: God and ancestors are the beginning, and if they are damaged, it will have consequences in our physical world, as we have seen with the consequences caused by Cerrejón.

A Not Very Clean Energy: Wind Farm

The winds are ancestral entities in the Wayuu cosmology. The winds, together with the sun and the moon, are responsible for the living elements that exist in the territory. There are different kinds of winds, and the Wayuu people know them: some are beneficial and loving, such as Jepirachi, soft wind from

the northeast; others are associated with hunger and drought, like Joutai, the east wind; Jepiralujutu are tricksters; there is also Tepichijua, the small whirlpool; Chipuutna, the strong hot wind; Wa'ale, the ruthless one that blows gusts; and, finally, Wawai, the hurricane that destroys everything (Guerra Curvelo, 2022). The Wayuu people's traditional knowledge of the wind is ancient, and now the same wind that has been part of Wayuu lives is going to be used by the State as a source of profit and energy transition.

There is still a lack of knowledge and understanding in Wayuu communities about what energy transition is and why the winds of La Guajira are at its center. Even though the Colombian State started a process of prior consultation over the territory, there is still confusion in the communities about what this project is and how they are going to benefit from it. The construction of wind farms involves use of a large portion of the territory, resulting in deforestation, and displacement of communities. Similar to coal extraction, wind farming brings noise pollution. With the aim of advancing the generation of "clean energy" and promoting the climate change agenda, these projects can be a threat to our rights as an Indigenous community if they are not going to be implemented with our participation and protection of our land. In this section of the article, I will discuss details of the wind farm project in La Guajira, taking into consideration the current situation of the Wayuu people.

La Guajira: The Key to Energy Transition in Colombia

As a coastal desert land, the wind in La Guajira is omnipresent. The President of Colombia, Gustavo Petro (elected in 2022), received from the previous administration several advances in terms of energy transition. The Ministry of Mines and Energy said that La Guajira "will be the epicenter" of said transition, since there are currently 16 wind projects granted and under construction that will have two transmission lines. The wind farm is going to be constructed in the municipalities of Uribia, Maicao and Riohacha (Acosta Argote, 2022). Among the projects, Alpha, Beta and Wesp1 stand out as the wind power farms with the greatest progress, while Guajira 1 came into operation in January of 2022. The Ministry of Mines and Energy has stressed that one of the focuses of the Colombian Government is the incorporation of

renewable energy.

The projects confirmed in La Guajira are the construction of 16 wind farms with an investment of US\$2.525 billion in the territories of Uribia, Maicao and Riohacha. According to Sebastian Vargas, an anthropologist with a master's degree in law and public policies, and adviser to companies that develop wind farms in La Guajira on issues of prior consultation and intercultural relations (personal communication, March 26, 2023), if there are 16 wind farms, 4000 hectares of territory will be used per park, if the park has the average extension that includes approximately 25 generators, depending on the area and the type of project. Multiplied by 16 parks under construction, they will cover approximately 64,000 hectares in La Guajira. Vargas gives us some details about the development of the project, noting that energy transition is a public policy developed by the Colombian State, which opens the door to the territory of La Guajira through concessions aimed at the private sector to develop wind energy projects.

The policy of economic concessions of the Indigenous territory is unlimited, and Vargas (personal communication, March 26, 2023) asserts it cannot be said that there are only 16 wind farms, because so far there is talk of more than 30 wind farms, which are currently in the prior consultation phase. From those first 64 000 hectares of wind farms already announced, a much larger number of rights awards will be made to develop renewable energy projects. It is a discretionary public policy.

The principal problem we have with this project is that it has no limits and is one of the causes of conflict with the Wayuu Indigenous communities. As Wielder Guerra states, it is not about representing the Wayuu territory as the "expiatory landscape" with unlimited capacity for projects to build and stream energy (as cited in Vargas Fernández & Palmar, 2023). The economic projects of the State cannot ignore our rights to the preservation of our land, culture and traditions.

Wayuu People Are Apart From the Climate Change Agenda in Colombia

The winds are an entity to us; they carry our spirits and ancestors. Our knowledge of the wind as a part of our culture must be included in the descriptions of these projects because the State should honour our land. Not only must our culture be described, but Wayuu commu-

nities also should be better informed about what energy transition is, because the spaces of dialogue and information have not been successful thus far.

The reception of these projects in Indigenous communities tends to be negative, because the first contact is with the private company, and they have access to the territory through the public policy designed by the State; the State does not act directly. Hence, the communities perceive this type of project as the business of private companies and this is the first factor that makes the Indigenous communities receive the projects negatively. If we perceive wind farms as a matter of common interest, then we must realize that these projects cannot be predatory toward the Wayuu territory. There should be a limited number of concessions aimed at the private sector to develop wind energy projects because we must keep the possession of our land and grasslands with our animals. If the State does not guarantee the protection of our land, our food system will be at risk, and so will our culture and traditional practices. Millennia of our cultural and territorial life can change drastically amid the economic boom of the wind farms. The State and companies must measure their ambitions so that they do not stop our life as Indigenous people.

According to Vargas (2023), energy transitions are a bet of global interest, but they are perceived as a bet of private interest among the Wayuu communities in La Guajira. These energy transition projects are being sold as a key to business and enrichment, but not in terms of sustainability and the climate change agenda. A significant problem in Colombia is that Indigenous communities are disassociated from the climate change agenda in the country; it is only discussed by companies, academies and environmental organizations. The Wayuu do not understand what the companies are doing in their territory, so the result is doubt and uncertainty regarding our role and the benefit we may receive from these projects. There is misinformation about what energy transition is. Energy transition is thought of as a private business and not as a contribution to the climate change agenda, and there is a sense of mistrust towards companies due to previous projects in La Guajira (the mining company of Cerrejón, for example). Generating clean energy is a bet of all humanity, thus it is important that

Wayuu people be part of the development of energy transition in Colombia. It is fundamental to create spaces for dialogue and information for Wayuu communities, so they can perceive wind farms as a matter of common interest and not a private interest. Even when the objective of the project is to generate clean energy and help reduce global warming, the truth is, the State and enterprises are not taking into consideration the knowledge of the Wayuu about our land, our ownership over the land and the livelihoods of Wayuu families. It is action that inflicts damage: it is not clean energy if it violates the most fundamental human rights of Indigenous people, it is greenwashing. I believe it is fundamental to hear our thoughts and knowledge about our territory before starting an economic project in our land. As described earlier, Wayuu territory is not only physical; the vision of the Territory of La Guajira is a biocultural environment conformed to by physical beings and spiritual beings. This knowledge encompasses the dynamics that exist between territory and its biological and spiritual wealth, and is immersed in the memory of the Wayuu, who have transmitted it from generation to generation.

Consequences of Wind Farms in Wayuu Territory

The building of wind farms requires extensive use of lands, deforestation and the removal of traditional Wayuu houses as graveyards. The sacrifice of Wayuu lands should be taken into consideration by the State. Sacred sites and grassland should be respected as they are part of our traditional practices and culture.

Aleida Tiller, Wayuu traditional authority and sociologist (personal communication, March 23, 2023), says there are several consequences, spiritual and physical, to the construction of these enormous wind farms. These include the elimination of grazing spaces and impacts on cultural practices.

The main livelihood of the Wayuu people is raising cattle and goats, a source of protein in our diet. Many of the transmission lines of the wind farms are being placed where there are no houses, that is, in places where animals graze. Eliminating these grazing places means less food for the animals, displacing them to other territories and putting the food security of the Wayuu at risk. The economic income received from the sale of animals is also at risk. Cultural and traditional practices are also placed at risk, because for the Wayuu, the sacrifice of animals is a practice to celebrate our relatives and bid

them farewell. If the herds of sheep are reduced, this cultural tradition will be affected.

The development of wind farms also affects our trees. A trupillo tree takes eighty years to grow, and this tree is an element to show the territoriality of Wayuu families and it also provides shade for the animals to protect them from the sun. The roots of the trupillo are part of traditional medicine and are used when animals have difficulty giving birth. It is not a simple plant for us; it is a part of Wayuu identity. The wind farm projects cause deforestation, and the most significant tree to us is the trupillo. Tiller (2023) says there exists an environmental management plan to cultivate ten trupillos for each one trupillo that is felled for the construction of a wind farm, but the social cost cannot be compensated. A planted trupillo will grow in eighty years, but Wayuu people need it now, and in eighty years we will no longer be here.

For Tiller (2023), the wind farms are going to affect the connection to the spiritual world. We are believers in our dreams because in dreams, we listen to the messages of our ancestors. Seeing the presence of new elements in the territory affects dreams. This lack of tranquility will cause Lapuu, the spirit of dreams, to not be able to communicate prevention to family members anymore; it is what we call Napinaka wayaa, the messenger.

There is precedent in the negative consequences of wind farms on Indigenous territory. In Norway, for example, the Sámi Indigenous people have been struggling with new wind power plants. In October 2021, Norway's Supreme Court ruled that a wind farm built on the country's central-west coast violated the protected cultural rights of the Indigenous Sámi by infringing on their reindeer grazing lands. For the Sámi, developing a wind power industry in reindeer herding areas can mean destroying the possibility of reindeer husbandry. "This means wiping away an entire culture, bit by bit, all in the name of sustainable electricity," said one of their leaders. They called the projects of energy transition "green colonialism" (Rasmussen, 2023). This is an example of the consequences of developing wind farms in Indigenous territories without taking into consideration the protection of their land and the development of their culture. Colombian authorities should take note of the mistakes of countries like Norway to preserve natural ecosystems for animal farming and to prevent legal disputes in the future.

Participation of Wayuu Communities in Renewable Energy Projects

The reality of Wayuu territory is a sad one, because of their abandonment by the State and discriminatory public policies that cannot stop poverty and have allowed the violation of the most basic human rights. The extraction of resources in La Guajira territory, such as coalmining, is an important part of the revenue of the State and private companies, but this enrichment is scandalous if we consider the way that Wayuu children die from malnutrition (previously mentioned) in the same territory in which this mine is located.

The economic boom of energy transition could be useful and positive if we consider the Wayuu people to be front and center in these kinds of projects. The Colombian State has an obligation to promote the participation of Indigenous communities to take advantage of the global energy transition. If the State does not do its job to fulfill its obligations to Indigenous people, then we will see results like those of the Cerrejón mine: State and private companies take all the profit as Wayuu communities continue living in poverty, with children dying.

Up to the present day, the incentive offered to the communities for the transfer of their territory has covered a thirty-year negotiation and an annual profit for the communities. Some communities have advisers who can moderately negotiate and make arrangements that consider the interests and rights of the Indigenous communities, but some have had to settle for paying 30 million Colombian pesos, or 50 million Colombian pesos, for the use of the territory for a period of about thirty years. That does not compensate for the damage and the change that the Wayuu territory is going to experience. As shown above, in some cases sacred Wayuu graves will be removed just because they are going to undergo an easement; we have to remove our sacred sites for economic reasons. For Aleida Tiller, this has corrupted the Wayuu mentality as we must cede our beliefs and practices for the interests of some private companies. The community says yes because they do not even know what prior consultation is; they are vulnerable and they accept the money because they are poor and they need to survive.

Vargas (2023) says that, for other communities, what should be a positive incentive is actually inadequate, because the profit gained by construction of

the wind farm destined for communities would be destined to satisfy the social debt of the Colombian State. This proposal is framed in the context of the 2017 State of Things Unconstitutional in La Guajira so it is not easy to believe. What the State offers is to take advantage of the economic boom of wind energy to fulfill what it has not done in its entire history: meet the needs of water supply, housing construction, schools, and so on for Wayuu people. There is no shared value. It is not paying off the State debt; the key to sustainability is conceiving of business that generates energy in a way that is balanced with the interests of the Wayuu communities, who are the owners of the territory and have the right to grow economically and not be only the beneficiaries of the aid.

The incentive to fulfill the basic need for human rights in exchange for the construction of wind farms in our territory is not enough. Indigenous people have the right to determine their economic and social development as a part of our right to free determination. The Colombian State should take note of the example in Canada. The Canadian government recognizes Indigenous people's right to self-government in the constitution and Canada is considered the leading country with regards to Indigenous participation in renewable energy projects. In the Nationally Determined Contribution under the Paris Agreement, Canada explicitly makes reference to Indigenous climate leadership (Government of Canada, 2021). After the Crown and private utilities, Indigenous communities in Canada control the greatest number of renewable energy assets and are participating in over 197 green energy initiatives. The forms of involvement, as outlined by the Institute for Human Rights and Business (2023) include:

- Indigenous ownership: This model offers Indigenous communities full decision-making power and control over a project's planning, management, jobs, profits and revenues and can strengthen the goals of reconciliation and self-determination.
 - General Partnership: Ownership is equally split between or among partners, Indigenous communities and private sector.
 - General Partnership: Ownership is shared equally between an Indigenous community and a

renewable energy developer with shared decision-making and equally distributed earnings.

- **Limited Partnership:** These are formed between utility partners and Indigenous communities or as coalitions of Indigenous and First Nations communities.

- **Equity Ownership:** This model is similar to limited partnerships, but the Indigenous partner often controls 25 percent or less of the project. (Institute for Human Rights and Business, 2023)

Wayuu people, who are the owners of a territory, do not have this kind of economic power in La Guajira. Sadly, the public policy of the State keeps them in poverty and only gives them humanitarian aid, without training for capacity-building in business and without equal participation in the projects that affect our territory. If our rights to decide the destiny of our land and to self-determination are guaranteed, then we could discuss the installation of “clean energy” in Wayuu territory. The spaces of dialogue with Wayuu people should take into consideration our understanding of our territory and respect our sacred sites, and most importantly, the State and private companies must stop treating Wayuu people as passive economic actors. We do not need charity. To say we are going to receive humanitarian aid and

have access to water, housing and schools thanks to the building of wind farms is not economic justice: fulfilling human rights is the duty of the State, not part of a negotiation.

The weaving of the life of Wayuu people requires us to keep our role as protectors of our land and culture. The State must recognize our rights over our land and our right to development. Without these conditions, then the wind farm projects and the next economic development projects that do not involve adequate consultation will lead to land dispossession, environmental impacts and social conflicts. A statement by the Special Rapporteur on the Rights of Indigenous Peoples (2017)

makes it clear that this is not an isolated case; it has happened with Indigenous communities around the world. This kind of project could transform and support local Indigenous communities and it is an opportunity for the government, renewable energy companies and their investors to make advances in the inclusion of Indigenous communities in the climate change agenda. Indigenous communities have

knowledge of their land and how to keep the balance between natural resources and living beings. We all could benefit from this knowledge.

With so many threads missing, how can we even begin our weaving? As I have described, each thread of the weaving in Wayuu cosmology symbolizes the connection between all the living things and the spiritual world in our territory. Without land, we do not have Wayuu communities and animals, and without animals, there is no food security or traditional practices. Without the Wayuu people, we do not have territory. Our weaving shows the importance of intergenerational

knowledge-sharing and connection between our people and the land. To continue going forward, we must endure and persevere in the protection of our land as we understand it.

Recommendations

1. The Colombian State must cease immediately the exclusion of Wayuu Indigenous communities from the climate change agenda in Colombia. Intervention in Wayuu territories is happening without taking into consideration our knowledge about the ecosystem and its dynamics.

2. The Colombian State must establish the pro-

“Our territory is not only physical; the vision of the Territory of La Guajira is a biocultural environment conformed by physical beings and spiritual beings.”

- Dayana Palmer

cess of Free, Prior, and Informed Consultation with the owners of the territory; dialogue with the authorities from each family and clan (eirrukus) should respect our sacred sites, livelihoods and land. Our culture must not be sacrificed. The wind farm project could generate truthful clean energy if it respects the knowledge of Wayuu people, our traditional beliefs and the use of the lands to maintain our livelihoods. States and private companies must reconsider the ongoing process of prior consultation in Wayuu communities to add an Indigenous rights perspective. Indigenous communities need to know what the project is about and how they can participate in the project.

3. A culturally adequate roadmap must be built, so the Wayuu can receive income from these economic projects. Wayuu Communities must be trained in the business of energy transition. In the future, Wayuu people should have the agency to propose wind energy business themselves because they know the wind and they know their land.

4. The incentive to fulfill the basic need for human rights in exchange for the construction of wind farms in our territory is not enough. Indigenous people have the right to determine our economic and social development as a part of our right to free determination. The State must stop treating the Wayuu people as a passive economic actor. We do not need charity. The State must recognize our rights over our land and our right to development.

5. An environmental management plan is needed to handle the projects of coal mining and wind farms; grassland for animals should be guaranteed, as should access to sources of clean water. Deforestation and the removal of sacred Wayuu sites should be addressed, The balance of the ecosystem is necessary to maintain our spiritual connection with the territory.

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THE BUFFALO NATION AND THE BUNDLE CARRIERS PROJECT

*Han, Mitakuyapi, SiHan, Mitakuyapi, Sitomni
S'a Ya Pi Win Emakiyapi Ye,*

Introduction

Hello my relatives, my Dakota name is Paints Red Around Her, my known name is Dustina Gill, I hail from the Wahpekute Band, The Shooters in the Leaves Band and am an enrollee of the Sisuwan Wahpetuwan Oyate, which is one of the nine tribes in South Dakota. The United States Government gave our tribe that name due to the two Dakota bands that were placed on the Lake Traverse Reservation and signed the 1867 Treaty. I am the 6th generation of Inkipaduta, Scarlett Tip, great-granddaughter of Ite Coka Wakanna, Holy Face in Center, Mahpiya Ohna Mani Win, Walks in the Clouds Woman, granddaughter of Maza Pe Win, Sharp Iron Woman, and daughter of Zi Eciya, Paints Himself Yellow. I am a wife and a mother to five children, four of which continue to walk Mother Earth. I am a grandmother to three grandchildren who also have their Dakota names.

I acknowledge and share where I come from because that is a part of our traditional introductions of who we are. I have seen six generations in my lifetime and so far and all have had tremendous impacts in my life. Our people, the Dakotapi, as with many other Indigenous people, think, live and plan generationally. Many times, we are carrying forward what has been carried for generations before us and will be passed on for many generations to come. Our responsibility is to learn, understand the shifting of the changes in our lifetime, and continue to share what was given to us. The knowledge and words I share with you come from my experiences and those in my life who took the time to share with me what they know.

I am a bundle carrier. I come from a family of bundle carriers and bundle keepers. The bundle car-

riers are those who have knowledge of the medicinal plants and their uses and were the healers of their people. The bundle keeper's bundles, and knowledge have been passed down with each generation within the families of Dakota society. Encompassed within this knowledge is knowing the relationships of the plants, soil, water and the environment.

The seasons and protocols of harvesting were as important as the uses of the plant. When the reservations were established, many policymakers in the United States either openly rejected Native sovereignty or envisioned it as significantly restricted in scope, confined to small or remote territories (Kantrowitz, 2020). The actions implemented by colonial powers sought to eradicate anything related to Dakota. To be caught doing anything that was not considered civilized to the "United States (US) government resulted in withholding of rations, imprisonment, and even death" (Miller, 2012, pp. 2083-2084). Kantrowitz (2020) further highlighted this colonial plan, explaining that "either way, their (Indigenous Peoples) cultural and territorial disappearance was essential to the future of the [United States] settler state" (p. 31). At this point in time, the bundle carriers quietly buried their bundles and took their knowledge underground, to only be shared in secret. When my grandmother's grandmother passed away, her grandfather buried her bundle with her. While her passing ended the passing down of that generational bundle, the knowledge continued, and the bundle began to be put back together with each generation. In this article I am going to share about The Bundle Carriers Project. This will give insight on how some things are coming

back full circle after surviving the most dedicated but failed attempts to completely eradicate it, and us, from existence.

Traditional Knowledge

The Indian Religious Freedom Act (IRFA) was passed in 1978 but the understanding of what that means is still not comprehended by those who are not familiar with cultural traditions of our people. The IRFA allowed American Indians to practice their traditional ceremonies in the privacy of their own homes, prison or in public areas (Proctor, 2014). The act protects the rights of Native Americans to exercise their traditional religions and ensures access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites (Proctor, 2014).

When I was a little girl, my grandmother started taking me to harvest medicines and would share stories of her childhood and being with her grandmother as they harvested. Each harvesting spot had its particular plants and its own process of how it would be gently taken for its nourishing or healing property. She would hum a wordless tune as she gathered. There are songs for the different types of harvesting and planting that are only known to those who such things are shared with. As a child I was prepared with a response plan if we were seen by any non-Native American passerby's— lay down and hide. Many times, if we were not near each other, I could hear her humming and then she would calmly call out, "lie down, hide until I say to get back up" and I would immediately do so without question. I did ask her the first time if what we were doing was wrong, and she said no. Confused, I asked her why we had to hide when gathering. She simply said, "because they wouldn't understand." So, for years that was how it went. As the years went by, she would point out little things to take note of for future harvesting. She would point out a newly planted crop growing and say, "don't ever harvest by crops because they put chemicals on them, and it will go on the plants." She would point out ditches by roads and explain that they use sprays here too, so they don't have to cut the grass— don't ever harvest in ditches. When we stopped going to the regular harvesting spots I asked her why, and she said because the plants are gone because those spots are being sprayed. Eventually, our harvesting spots became desolate. She and my father went out to look for new spots and when we

went, she would tell me that I had to lie down in the back seat and wait until we arrived before I could get up. I asked her why and she said,

"...because we have to keep these spots secret now. I don't want anyone bothering you to find out where we are going because they know that you come with me. People are buying these medicines now, so people are selling them. They are overharvesting and killing the entire area. They don't respect the protocols and now those spots are gone."

Her urgency that this knowledge be remembered was one of the things from her teachings I still hold close.

I did not realize until the writing of this article that my grandmother lived her entire life gathering in secrecy, she had seen the gatherings spots dwindle and even die in her lifetime. There were plants she said she had only seen as a child, and as an adult, would know them to be gone. She transplanted some medicinal plants, hoping for them to take, knowing she would not see the day when they did, but that her grandchildren and their grandchildren would. The writing of this article has also brought a sad realization that my grandmother's entire life was spent gathering plants that were already endangered or nearly extinct. By the time my Grandmother was born, the buffalo had already been gone for over 30 years— the buffalo population was wiped out in the late 1800's and she was born in 1925. Their relationships to the plants were not fully realized in her lifetime. The tribal buffalo farm was in its first few years of being introduced on our reservation before she passed away, and even then, the relationship between the plants and the buffalo was not yet a thought. Reintroducing them to the diet of our people was the only intent.

In my 41 years of plant gathering and harvesting, I never thought beyond the current relationships of the plants and our roles of learning and teaching in our family. It was just something we did based on the seasons without thought. When creating Nis'to, a native youth non-profit which focuses on youth leadership and skill building, we realized that one of the detrimental and damaging effects of the orphanage and Indian boarding schools was the breaking of the traditional intergenerational teaching systems for many of the families. This is a well-documented and understood phenomenon that carries universal understanding across Indigenous families and communities across the world. In order to restore these teachings to the

point where families are ready to pick them up and continue, I felt that it could be the responsibility of Nis'to to create for our youth what I and other families had the honor to grow up with.

The Bundle Carriers Project

Eight years ago, Gerald German Jr., an enrolled member of the Sisseton-Wahpeton Oyate, and fifth-generation rancher asked if there was a way that we could study

the effects of buffalo on the land versus cattle. He had introduced Buffalo to his land two years prior, and said that he noticed a difference in the land and plants where the Buffalo were present but wanted it to be studied in more depth. We partnered with the University of Virginia's Global Studies Department and created the Bundle Carriers Project. The partnership was an interesting and positive blend of culture, traditional knowledge, and academia. The mutual understanding and agreement are that the university has no access to the cultural pieces of the project. Their participation required sharing the research methods they used with the youth and elders involved. This also included sharing the

mapping of the different methods that helped us understand how the educational research institutions used for their work in other parts of the world.

Partnerships of Indigenous led projects utilizing Indigenous knowledge and academic resources with universities create a unique and powerful solution to many challenges that have universities perplexed. The simplicity of Indigenous knowledge

is thousands of years old and has never wavered from its beliefs or protocols. The sought after understanding by universities sometimes limits itself because such knowledge is not always found inside of a book. When Indigenous and western approaches are paired together, so many outside-the-box solutions reveal themselves as we move forward. The Bundle Carriers Project has always been Indigenous-led. This was an innovative approach for

some of the professors and

definitely for the students, because it went against everything they learned in their classes. Only after meeting with elders and learning why nature has always been incomperable and does not always bend to mankind, did they begin to understand and adapt their learning to match nature and not textbooks. The Bundle Carriers Project would not be successful otherwise, because if it were university-led, so much would not have been implemented nor would the community have trusted their intentions or process, and it would not have gotten off the ground.

Knowing these educational institutions were an excellent partner for research methods and data collecting, they are also a tool to legitimize Indigenous knowledges through the scientific methods and data collecting work that is done

in the Western education sphere. It was interesting to see science catch up to cultural knowledge that has been passing generation to generation for thousands of years. The agreement and understanding of when research and cultural conversations between the university students and our community elders did not overlap were discussed when new students came onto the project. This has always been respected by the university, who understand

“At this point in time, the bundle carriers quietly buried their bundles and took their knowledge underground, to only be shared in secret. When my grandmother’s grandmother passed away, her grandfather buried her bundle with her. While her passing ended the passing down of that generational bundle, the knowledge continued, and the bundle began to be put back together with each generation.”

- Dustina Gill

they are guests on our land. This partnership allows mutual understanding and respect for each side. It's incredibly important to understand the legitimacy of cultural knowledge, and recognize how scientific methods can work alongside Indigenous ways of knowing to be applied to projects such as this.

Research Findings

The research piece of the project compared multiple plots on German Ranch, the buffalo farm owned by the Sisseton-Wahpeton Oyate and the local state refuge. German Ranch was in its second year of having buffalo present on land that had not been touched by any agriculture farming. The other plots studied were strictly the effects of cattle on the plants and land. Cattle had been present for over 80 years on these plots. These were the first plots we started studying to compare the effects of buffalo versus cattle on the land itself.

Sisston-Wahpeton Oyate

This buffalo farm is owned by the tribe and had cattle present for years prior to placing buffalo on the land, and it is also sprayed with chemicals funded by the US Government through a grant. This land was included in the study after the second year of the project, to compare with the different land uses on German Ranch as a result of the chemicals being used.

Local State Refuge

Within the reservation borders is state owned land that is being used as a state park and wildlife refuge. This land has no buffalo or cattle, nor is it being sprayed with any chemicals. This was plotted out to study and compare the presence of native and invasive plants in these plots versus the plants and land in the other plots with buffalo and cattle being studied. There were a number of differences between the plots of German Ranch and the tribal buffalo farm, including: the history of land use, the use of chemicals, the ratio of buffalo per acre, and the feed used in the winter. German Ranch land was unbroken, and chemicals were never used prior to the buffalo being placed on it. Both used feed from their lands in the winter, with German Ranch being chemical free. The local state refuge land was unbroken and with buffalo not being present in the history of state ownership.

German Ranch

The plots on German Ranch varied in the longevity of the presence of buffalo. The plots that the buffalo were introduced in the span of two years had a larger presence of native tallgrass prairie plants. The plots where buffalo had been for a year had less of a presence of the same plants. Each year there was a vast increase of native tallgrass prairie plants present in the plots. The plots where cattle were present had no native tallgrass prairie plants, even the grass appeared to struggle to grow. The grazing effects on the land between the two animals were due to the make-up of their teeth, their biting techniques, their hooves, and the use of their hooves while eating. Buffalo when eating have movements that are similar to planting. Their saliva can also be comparable to a natural organic fertilizer, which demonstrated that ungulate grazing, specifically bison, decreased available biomass in a set grazing area but significantly increased plant quality by increasing nitrogen, which is comparable to some available market fertilizers (Moran, 2014). Studying their saliva further is our next offshoot project for our youth. The local state refuge land had a small presence of native tallgrass prairie plants but nothing considerable when compared to the land where buffalo were present. All plots had different levels of invasive plants. The plots with the increase of native tallgrass prairie plants did appear to have a decrease of invasive plants.

Bundle Carriers Camp Land

We recently purchased 30 acres of land that has a stream running through the property. This will be the permanent place for the Bundle Carriers Project and Camp. The land has been used for farm crops for at least 100 years. The stream was manmade in the 1980s as a flood diversion route from the melting snows in the coteau above the land. This stream runs through a cattle farm prior to entering our 30 acres. The intent for this land was to research various soil and water restoration methods on agriculturally damaged soil, and testing plots will be zoned and studied each season. While it is usually an estimated six years for soil restoration, this has not been tested with a cultural lens and culturally relevant methods for our

region. Buffalo will also be present on certain plots with their presence and effects researched and documented as it was on the other plots elsewhere on the reservation. They will be raised as yearlings to create a relationship with us and a trust so that we can gather their saliva. There is a male buffalo at German Ranch that was raised this way, and he is very friendly with the German Ranch family. His name is Billy, and while he was placed with the other buffalo after adulthood, he still comes to visit family when they are near. We are hoping to have the same results with our buffalo calves. The water in the stream will also be testing with different water filtering plants placed in different areas of the bends in the stream to test their effects. The study of the current plants and whether they are native or invasive to the region will be documented as well. We are hopeful that the fact that beavers have moved into the stream is a good sign of a healthy water level.

Future Plans

Two traditional structures will be built on the land for the seasonal gatherings and the Bundle Carriers Camp. An earth lodge structure as well as a bark lodge will be used for traditional and cultural purposes when we gather for land restoration work. This land and the restoration project will be used as an outdoor learning space for anyone wanting to learn more to take back to their lands for their own land restoration work. This project is being mapped out and blueprinted to be shared with anyone wanting to do similar work without reinventing wheels.

Final Words

My grandmother always said, “we are born just like everyone else...someone had the compassion and love to teach and share with us what they know...we are made up of all those people in our lives.” As a good relative we must keep this lesson in mind as we work towards healing Mother Earth, understanding how to restore her plants and medicines, and we must share this process with our relatives who want to do the same on their lands.

Mitakuyas, My relatives, *Demiye, Sitomni S’a Ya Pi Win*, I remain, Paints Red Around Her. Granddaughter, daughter, mother and grandmother of my relatives.

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Melanie M. Kirby

Pueblo
United State of America
North America

THE IMPORTANCE OF PLACE, POWER, AND PURPOSE IN POLLINATOR CONSERVATION

Landscape

There is a place sculpted by fire, water, and air over millennia, where chiseled landscapes encircle a long river carrying the source of life from melting alpine glaciers through juniper-freckled canyons and into valleys growing apples, wine grapes, pecans, cotton, and revered chiles. New Mexico, also appropriately dubbed the 'Land of Enchantment' by Weigle and White (2003), is home to my maternal Ancestors. It is where the Pueblo, Apache, and Diné peoples reside. It is where I learned my origins, and where I presently reside and continue to build my future as a land steward and professional apiculturist (beekeeper).

I've travelled many a bumpy road, in the darkest of nights serving as a chauffeur to beings of sweet starlight. I migrate with them like a shepherdess with her flock of winged midwives- a fellow follower of the bloom, a self-proclaimed Nectar Nomad. I was introduced to the artistic science of beekeeping close to three decades ago as a United States Peace Corps Volunteer collaborating with Indigenous farmers in the jungles of South America. The bees captivated my curious mind and working in an outdoor office made of fresh air, flowers, and freedom, enticed my soul. My nomadic journey as an apiculturist has taken me far from where I could ever have imagined, coming from a humble home in Pueblo American Indian country in New Mexico.

My heritage is a mosaic of cellular blood memories influenced by my Native American ancestors who instilled in me a profound reverence for place and purpose, and to pursue acts of community service. So, I chose to become a bee farmer as I wanted to continue to learn from Mother Nature and Father Time. As

a farmer, I share beekeepers' voices of concern and need for adaptation and innovation to fulfill our commitment to global food production. Sharing their challenges, I became encouraged to return to academia to help quantify their observations and advocate for pollinator conservation. Now as a researcher at the Institute of American Indian Arts in Santa Fe, New Mexico, my quest to better understand the relationships between cultures, food systems, and stewardship is at the forefront of my work.

There are over 20 thousand bee species that have been catalogued (Orr et al., 2020, p. 451). *Apis mellifera*, better known as honeybees, are but one of those species, which also include over 30 subspecies or ecotypes of honeybees. Today's contemporary honeybees are like some of us and our ancestors, immigrants to North America. They have adapted and become the backbone of 'American' agriculture. There are distinct ecotypes or subspecies of honeybees, and these ecotypes carry genetic histories like seeds containing their very existence and memories of creation. Within each one, they have the power to nurture and adapt, and the magnificence to create light, food, and medicine for the world.

One of the things I most enjoy about beekeeping is that it bridges cultures beyond borders. Beekeeping connects us to our origins as fellow beings of light, as a part of this land, not separate from it. This magnificence is alluring and inspires me to find and connect with beekeepers across the globe. I invite you readers to accompany me on my Nectar Nomad journey, as I chase blooms, encounter cultures, and follow the liquid starlight known as honey, from flora to flavor to

feast.

Nectar Nomad

I am Melanie Margarita Kirby- an Interdisciplinary weaving cultural, artistic, and scientific approaches to apiculture and beekeeping by exploring kaleidoscopic concepts and implications of land stewardship, agroecology, food systems, biodiversity conservation, and outreach. I am a tribal member and mestiza of Tortugas Pueblo of Tiwa, Mescalero Apache, Hispanic, and Caribbean descent. In 2005, I cofounded Zia Queenbees Farm & Field Institute in the southern Rocky Mountains of northern New Mexico which specializes in breeding regionally adaptive bees (Mast, 2015). I returned to academia after being in the field for over two decades as I was inspired to become a translator between the field and the lab, and to better advocate for marginalized farmers by learning how to quantify experiential land stewardship to broaden narratives and support diverse knowledge systems.

My academic journey took me to Washington State University, where under the advisership of Dr. Walter S. Sheppard, I completed a Master of Science in Entomology. My graduate research focused on utilizing RFID (radio frequency identification devices) to measure *Apis mellifera* queen honeybee mating behavior (Seehafer, 2019). Currently, I serve as the Extension Educator of Land-Grant Programs for the Institute of American Indian Arts- a contemporary arts tribal college located in Santa Fe, New Mexico. My research efforts revolve around pollinator stewardship and the connections to place integrating cultural and biodynamic relationships as rooted in ancestral and traditional ecological and technological knowledge interwoven with western sustainable agriculture science. My bee breeding efforts also incorporate pollinator conservation with diverse international communities including SlowFood-SlowBees, COLOSS, and as Founder and Director of The Adaptive Bee Breeders Alliance.

Before the bees found me, I was overwhelmed; I couldn't decide which path in life compelled me. I had finished high school in a dusty border town and aimed to reconnect with the roots of my Caribbean ancestry. As someone often judged as not Brown enough, Black enough, Red enough, and most definitely not White enough, I turned to dancing to lull the angst of warring blood memories coursing through my veins. The vibrations of the music, like a manufactured prelude to the bees, allowed me to

feel alive without the oppression of skin color and poverty that confine many of us through the Western "one size fits all" mentality.

The decline of pollinators globally has begun to be recognized as indications of broader ecosystem health and stewardship issues (Rhodes, 2018). As we begin to recognize the issues and challenges, it is imperative for our human society to account for its practices to land and water management and to reintegrate or re-Indigenize stewardship practices to reconnect not only ourselves, but our pollinator, plant, and animals as relatives who also deserve the right to healthy environments and longevity. As such, I will take the reader from the past to the present to our manifested future within this article.

Relatives

My home and our traditional ways of living, our interactions with our environment and with our plant and animal relatives, including the bees, are being affected by industrialization. This Western affliction has led to the commodification of ecosystem services through a misinterpreted acceptance of limitless availability and profitability (Kosoy and Corbera, 2010). Yet, ecosystem services are not infinite. There are limits that must be respected and conserved to promote biodiversity health and planetary wellness (Stein et al., 2017). Beekeeping and pollination services, viewed through a Western lens with a focus on profitability has become the backbone of American agriculture business. This disregards Indigenous perspectives and land stewardship responsibilities, as well as the reciprocal relationship between species. Honeybees are native to several continents and have been introduced or reintroduced to others (Kotthoff, 2013). They have migrated of their own volition as they have sought floral resources and habitats in which to survive. Honeybees have also been transported to diverse landscapes- their ability to adapt is part of their resiliency and evolutionary legacy. There are races, ecotypes, and subspecies of honeybees, which have adapted to survive in various climates. Honeybees were reintroduced to North America with migrant influxes starting in the late 1400's as fossil evidence found in Nevada dating 14 million years was found- *Apis nearctica* (Engel et al., 2009). Honeybees are very similar to humans in that they have adapted to diverse topographies, they follow their spirit foods and medicines of nutritious pollens and nectars, and they provide

for their families, their communities, and their hive. Honeybees also share a humanesque similarity in that they are immigrants to unfamiliar landscapes, they have adapted and become nuanced in learning from these landscapes. The pollination services they provide are critical in today's industrialized agriculture practices. However, honeybees have unfortunately become exploited as exemplary pollinators within the industrialized agriculture industry.

People must recognize that we are not separate from nature, we are a part of it, and this connection and relationship to our Earth Mother and Father Sky is a relationship that must continue for future generations, through the development of respectful and responsible approaches to stewardship. The first beekeepers, farmers, ecologists, and scientists were and continue to be Indigenous Peoples around the world. The bees have guided me— an Indigenous woman— around the globe, from South America to the South Pacific, to Central and North America, to the Caribbean, Europe, and Africa. They've exposed me to the vibrations of the world—the broadcast and reception of living things—from the murmur of rain whispering its seepage into soil, to the swaying of sun-seeking stalks as they crescendo into bursting blossoms full of perfume and weeping nectar, helping to nurture our ever-present cycles of life, death, and reciprocity. In the here and now, the bees help us make sense of an often unfair and unjust society that can and should be reformed into a manifestation of our own design. A fair world where cultural diversity is accepted and allowed to nurture individuals who are empathetic, motivated, and driven by reciprocity. The bees teach us the ultimate lesson: that it takes a community to survive and succeed.

No one bee in a honeybee colony can thrive alone. Each is keenly aware of the world and its natural truths. In their various roles and jobs, honeybees work together to gather food: pollen for protein; nectar for carbohydrates; propolis for sanitizing and sealing their abode; water for cooling; and air for circulating (Tsuruda et al., 2021). All bees (both solitary and social) learn from their surroundings and from the changing seasons. Honeybees sweat together to build honeycomb. They satiate their hunger by pollinating plants so that growth cycles continue. Their lives are the very definition of reciprocity: giving back to receive again.

Possible solutions to the problem of pollinator decline include a recalibration of what it means to be human— and through shared Indigenous World Views of interconnectedness— that our human existence is

only possible because of the many relationships between our plant and animal relatives sharing landscapes. By recognizing that we humans are part of nature, we can better acknowledge that plants, animals, and elements are our relatives, and we can begin to reconnect with one another by caretaking our shared spaces for continued existence. By learning from our plant and animal relatives— across time and landscapes— we are better students, and teachers, for bees have the power to nurture and adapt and to create light, food, and medicine for the world (Jefferess, 2012).

Re-Indigenization: The Importance of Pollinator Stewardship

Efforts to develop and extend outreach, education, and community collaborations are paramount to igniting and furthering the warmth of reconnecting with our shared spaces to develop conscientious approaches to land and water stewardship. Efforts to develop broad spectrum and multimedia approaches to outreach and education development can happen both locally to globally. Focusing on re-Indigenizing approaches to stewardship and conservation can help to amplify disenfranchised and marginalized knowledge systems that were developed through millennia.

The term Re-Indigenization refers to the process of returning a practice to its Indigenous roots through the process of moving back to the foundations that originally held the core components of the practice together. Nelson and Shilling (2018) highlight the importance of “re-Indigenizing” our understandings of the land, that focus on “fostering society-wide knowledge and ethics of the specific requirements of *tmix*” (land) in each place, while creating institutions at local levels to meet those requirements.” I was already aware of the concept as I have been practicing it my whole life— trying to find a balance while working within and in between two worlds. There is a noticeable difference in the Western world, academia especially, of the difference between Western knowledge and Indigenous knowledge being one of fact versus feeling, respectively.

The recognition of diverse knowledge systems is not a new concept. But rather, the act of acknowledgement and acceptance of diverse knowledge systems has been suppressed by the forced assimilation to Euro-centric ideologies and practices (Leonard et al., 2020). The lack of acknowledgement and acceptance of Indigeneity as a viable knowledge system is in direct correlation to the intentional genocide of Indigenous peoples and their communities around the globe. For example, by trying to erase the food and animals, such as amaranth and buf-

falo, in addition to forced assimilation, culture and language bans, this effectively erased people of their cultural perspectives, traditional practices and sabotaged their ability to assure continuity from past to present ancestors. Attempts at erasure of Indigenous peoples' perspectives has left the current constructs of social, economic, political, educational, and medical systems to be in deficit in understanding and relevance (Wolfley, 1991). Relevance is a significant component of understanding (Wilson, 1993). Without relevance, there is a disconnect. And disconnection is detachment. Detachment is loneliness. Loneliness can lead to depression and loss of hope. And a loss of hope is a loss of sense of self, sense of family, sense of community, and sense of belonging and purpose (Tschakert et al., 2017).

This multifaceted approach to existing can be contextualized in reference to the "4 R's" of First Nations Higher Education which include respect, relevance, reciprocity, and responsibility (Kirkness and Barnhardt, 2001). And which more recently have 3 additional "R's" as presented by Blanchard and Montgomery (2022), which include relatedness, relationships, and redistribution. Contextualization of these "7 R's" is simultaneous within indigeneity. This is opposite to the epistomes of the Western sense of self as independent, individual, and irresponsible- or rather, not necessarily liable or held accountable for actions and beliefs that are dismissive of others and their approaches to stewardship of self and planet. The proverbial table can be made longer to be more inclusive, and more diverse in perspective and approach by inviting the broadening of narratives and the recognition that we are all capable of and responsible for our shared lived experiences.

From the skies to the seas, to the land, the trees, the bees- the vibrational frequencies of life and creation swirl all around and through us. Our abilities as Indigenous researchers, and storytellers encourages us to marvel in community on the majesty and mystery of our natural world. We have a responsibility to re-indigenize scientific inquiry and to promote cultural expression as multifaceted parts of a greater whole. Creative communication through science and community storytelling can be shared across cultures, and beyond borders. Reflecting on what bees can teach us, we can forward those lessons of belonging to a community, to a place, and acceptance of the responsibility that comes with acknowledging and respecting relationships of how

we as humans came to exist across landscapes, we can then better advocate for fair and equitable stewardship practices. We can also better advocate for respectful and relevant approaches to diverse cultural perspectives and nurture reverential acts of reciprocity to ensure that our plant, animal, and pollinator relatives survive and thrive as we hope to- across time and space, and in relationship with all of us.

Dimensions

Relationships are rarely dichotomous and indeed more complex the more we review the synchronous aspects of sensory and emotional responses. Thus, relationships are multidimensional and increase over time. There exist various planes of existence that are woven into what we experience as reality- the physical realm, the intellectual realm, and the spiritual realm. And this can be experienced through food, the acts of growing and gathering food, and the displays of the elements as forces of nature interacting all together synergistically (Reinhardt, 2015).

Dimensionality is in direct correlation to life: there is no Earthly life without water; no water without the moon; no moon without the Earth; and no Earth without the sun. For pollinators, there is no nectar without flowers, no flowers without soil, no soil without growth and decay, and no growth and decay without water, without sun, without existence. What an unforeseen consequence of evolution that humans would consider themselves to be at the top of the pyramid when our very existence is predicated on all these amazing living organisms that have been in existence for so much longer than we have. The truth lies in time, and the more time that an organism must exist, the probability of adaptation, proliferation, and subsequent continuity can ensue- if all is respectfully kept in balance.

So, what is balance? Why is it that the Euro-centric Western-minded approach to stewardship tips the balance to the far extremes? Despite the acceptance that matter cannot be created out of nothing- the Law of Conservation of Matter. Introduced in 1789 in Lavoisier's Axiom, finite divisibility of general systems is verified by demonstrating that the basic particles, where a basic particle is one particle which can no longer be divided into smaller ones (Lin, 1995). Thus, it is one of the ultimate paradoxes of our time that Western knowledge has assumed natural resources are limitless.

Dynamics

The interface of genetic expression (genotype) crossed with environment leads to phenotypic expression because of adaptation and resilience (Jablonka and Lamb, 2006). This applies to all living organisms including humans, pollinators, and plants. Adaptation is a result of phenotypic plasticity and its importance rests on survival mechanisms and the quest for longevity and sustainability (Price et al., 2003). Indigenous peoples' observations noted these connections between kind and type as well. Stories of observations, records of the patterns of the elements, and the outlying occurrences that were seemingly rare and coincidental, all have been observed.

The quantification of these Indigenous peoples' observations is different than that of Western measured observations. The quantification is not only felt, but it is also peer-reviewed by the whole of Indigenous communities as observations become shared experiences. And shared experiences can in turn be reviewed as replications that result in a measurement of empirical and enduring significance. The world's first scientists, educators, healers, artists and farmers have in fact all been Indigenous people. The magnitude of observations and experiences as passed from one generation to the next leads

to the establishment of Traditional Ecological Knowledge (TEK)- or Indigenous Science & Technology (Nelson and Shilling, 2018).

The diversity of Indigenous peoples' knowl-

edge systems, as related to time and place, and the multidimensionality that expresses, can assist in redeveloping sustainable approaches and conscientious methodologies that can support and nurture conservation (Zidny et al., 2020). The integration of Indigenous peoples' knowledge with Western approaches to scientific inquiry can remove the notion that life exists in a vacuum. The resulting unity of incorporating science with sage methodologies will lead to a more comprehensive review and acknowledgement of all that life involves, including the perception of the observers. An example of this shares that content areas where attention to Indigenous Local Knowledge (ILK) was particularly important for questions in applied ecology. These include enriching understandings of nature and its contributions to people, including ecosystem services, assisting in assessing and monitoring

ecosystem change, contributing to international targets and scenario development to achieve global goals, and generating inclusive and policy relevant options for people and nature (McElwee et al., 2020).

This inclusivity aspect includes matriarchal development of ILK and stewardship approaches (Kuhnlein, 2018). In the case of matriarchal and matrilineal cultures, is there a good chance for food security and dietary adequacy if the ecosystem and political-economic structures are

“Beekeeping connects us to our origins as fellow beings of light, as a part of this land, not separate from it. This magnificence is alluring and inspires me to find and connect with beekeepers across the globe.”

- Melanie Kirby

supportive? Do women's priorities and values favor community health, particularly for children as legacies of the continuity of the interconnectedness- from past to present to future- from ancestor to descendants? As the cultural distinctions between communities of Indigenous peoples has been manipulated to create opposition with Western Eurocentric managed ecosystems, we must consider the question if the human race will survive relying on only one knowledge system.

Indigenous stewards learned how to locate, sustainably harvest, and encourage new growth and propagation of plants. Through foraging, planting, intercropping, wild harvesting, Indigenous stewards shared the medicines they collected and in so doing, expressed reverence and acts of reciprocity to regenerate landscapes (Turner et al., 2022). Locating spirit foods and food medicines became a nuanced practice and demonstrates the keen attention to detail of Indigenous ecologists and communities to survive. Survival has led to resilience, which requires adaptation. Adaptation is dynamic, it nurtures genetic plasticity and phenotypic expression, and is regenerative. Such is the case with the many diverse organismal relatives, including our oldest kin- the rock formations, our plant families, and our animal and insect relatives. Indigenous land stewards have long and lasting legacies, as they have learned to adapt to shifting landscapes, from nomadic tribes to settled tribal communities- women's stewardship roles are paramount to habitat conservation and ultimately, for familial and community survival (Kermoal and Altamirano-Jiménez, 2016). Indigenous women have been and continue to be instrumental in passing on their experiences and wisdom through experiential learning and teaching by doing, and through illustrative storytelling. This includes where to locate harvestable nourishment and healing foods.

With this observational review and sentiment of exploitation, we reflect on the need to re-indigenize apiculture and beekeeping. The bees found me by assignment in the jungles of South America where I worked with Guarani farmers in Paraguay. I became enraptured with learning from the land and from land stewards- who did not have advanced degrees- but who knew so much more about the world, about life, and about survival than can be quantified. I struggled with understanding how and why farmers' observations and experiences were considered irrelevant and unvalidated in comparison to peer-reviewed, pub-

lished articles in journals by people who did not have the depth of experience that these land stewards have.

I anticipated returning to academia after a few years of working with bees and their keepers. Yet, my path was inspired to dedicate more time to learning from the land and from land stewards. I spent eight years working for others- including several commercial beekeeping operations in Hawaii and Florida. In 2005 I co-founded Zia Queen bees Farm & Field Institute based in the southern Rocky Mountains of Northern New Mexico- my home state and ancestral lineage. I began specializing in queen honeybee breeding- describing myself as a seed saver where the bees are the seeds. My approach and my process have and continues to follow conscientious methods to bee stewardship- all rooted in the shared Indigenous worldview of interconnectedness.

For over two decades, I worked directly with farmers and beekeepers, across cultures and landscapes, who inspired me to learn the language of 'Western science' to better serve as a translator between the field and the lab. As well as to help quantify farmers' observations so that collectively we could better advocate for more sustainable food systems and biodiversity conservation. My commitment to broaden the narrative- to make the table longer, has, is, and will always be rooted in Indigenous knowledge systems and epistemologies. I was initially labeled for many years as an 'outlier' by Western scientists in my approach and in my communication style- which integrates poetry and mixed media approaches to storytelling. More recently, my approaches have been acknowledged with invitations to share Indigenous perspectives in apiculture and agroecology by groups such as National Geographic Society, Slow Food International, and Apimondia- World Beekeeping Congress.

My efforts bridge disciplines and perspectives. My journey has indeed taken me far from where I ever could have imagined as I returned to academia to pursue a graduate degree in Entomology from Washington State University, to learn the language of Western science. My current role as the Extension Educator for the Institute of American Indian Arts in Santa Fe, New Mexico allows me to weave diverse knowledge systems- both Indigenous and Western (where appropriate) to integrate arts and sciences through creative culturally relevant and accessible communication. My commitment to community is expansive, as I often demonstrate through my work as the founder and

director of the Adaptive Bee Breeders Alliance- a grant-funded network of bee breeders and researchers across the United States. I'm also the founder of Poeh Povi: The Flower Path- an Indigenous Puebloan Matriarch coalition engaging in community initiatives for reforestation and regenerating landscapes impacted by intense wildfire damage and extreme weather crisis brought about by climate change.

Women's Indigenous knowledge is not an imaginary ideal. It exists and is alive. It is vibrant and adaptive. And it is what will nurture all of us from infancy to elderhood into the future, repeatedly as a part of Indigenous peoples' legacy of continuity, of connections to place, and our commitment to accept the responsibility and the power to be better stewards of our pollinators, and our planet. This is our purpose.

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Ryann Monteiro

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RESISTING THE CONSUMPTION OF INDIGENOUS KNOWLEDGE

Writing As Resistance; Writing as Death

When given the opportunity to write this article, I struggled with my complicated relationship with writing. My father's culture is one of oral traditions, a practice that requires a relationship between the storyteller and the listener. To speak is to breathe life into something, to keep the story alive. On the other hand, my mother's religion centers a Holy book that relies primarily on words written on paper that has been used to justify life for some and death for others. I was raised by both, but I am ruled by neither, refusing to reject one part of my identity to appease the social and cultural expectations of the other. That is the seat from which I write this article, acknowledging the negotiations and contradictions of what my existence signifies.

In my own personal practice, the act of writing is symbolic of putting something to rest. For me, to write means that I no longer feel the need to continue to give something life. In my professional practice, to write is to document that Indigenous resistance is not, has never been, and will never be silent. In Western culture, to write is to immortalize a story as Truth.

While navigating these opposing viewpoints, I find solace in Bell Hooks' (2014) writing on homeplace as a site of resistance. Although she writes of homeplace as a physical location, I draw inspiration to create a scholarly homeplace, a space where my community can return for renewal, self-recovery, and community healing (Hooks, 2014). In the meantime,

I am grateful to Knowledge Makers for hosting me as a guest in their scholarly home and for allowing me to express my resistance, as it is a necessary part of our community's healing process.

Journey to Noepe

Off the southeastern shore of Massachusetts is a small island called Noepe, the ancestral homelands of my community, the Wampanoag Tribe of Gay Head Aquinnah. Throughout my childhood, a trip to the island was always an exciting adventure. My dad would wake us up at sunrise, the smell of eggs and linguica wafting from the kitchen as my mom prepared breakfast sandwiches wrapped in tin foil for us to eat on the car ride to the ferry. We would pile into my dad's truck with our backpacks filled with snacks and books to keep us entertained for the day ahead of us. It would take us 45 minutes from our front door to get to Woods Hole, the ferry terminal. However, all off-islanders know that to not miss the boat you need to add 30 to 45 extra minutes to your trip to allow enough time to park your car in the faraway lot and take the shuttle from the parking lot to the ferry terminal. We never parked in the shuttle lot. My dad would drive confidently down to the terminal and pull into the pay-to-park garage, where you pay the cost of convenience.

While waiting for my dad to finish with the parking lot attendant, my sisters and I would wait on the edge of the lot on top of the hill, watching a sea of people funnel out of shuttles, buses, and private cars and into the terminal. Among the sea of people, we would scan the sea of faces to spot familiar ones

other aunts, uncles and cousins who were making the trip back home just like us, other off-islanders. As kids, we would always run up ahead of the adults to try to secure the best seats on the ferry, and to make sure that there were enough of them to sit our entire extended family. As we sailed on the water for the next hour, we would run around the ferry playing and catching up with one another. Before the ferry docked, we would return to our parents, or another aunt or uncle to all exit the ferry and into the parking lot where we would all gather together and wait for someone from the tribe to pick us up in tribal vans or buses to bring us up island, another 45 minute drive to the tribal administration building or to the beautiful Aquinnah cliffs.

I start this article with the journey from my physical home to my ancestral one because it is the experience of all off-islanders who no longer have an island home to stay in. A minority of our community lives on the island, but most live off it. Wampanoag people have always traveled by land and sea, but much like Indigenous peoples throughout the globe, the dispossession of land was set in place

at the onset of colonization, forcefully displacing many Wampanoag People both physically and economically. The evolution of the colonial project has turned Noepe into Martha's Vineyard, an upscale vacation destination for the famous and elite, and those who wish to be in close proximity to status and wealth.

As Wolfe (2006) argues, invasion is a structure, not an event. The agenda to keep Wampanoag people from reclaiming our land from governments and institutions is ongoing. Part of

our resistance is to hold on to our land and reclaim more of what was stolen to heal the land and our community. To bring our people home along with the stories they carry with them.

This resistance is, in part, why I cannot share the stories of Wampanoag food and knowledge systems with a non-Wampanoag audience in good conscious when too many of our own community members are seeking these stories, traditions, and ceremonies but do not have access to them for reasons that are both public and private.

Resistance As Service and Stewardship

When I first applied to Knowledge Makers, the research project that I envisioned was one that focused on Indigenous food and knowledge systems on a national level. My proposed project was to research the political and economic factors that have disrupted Indigenous food sovereignty and knowledge systems in the United States. As an educator, I aim to provide non-Indigenous people with the foundational knowledge of what was done to us and how we have responded and resisted throughout history, with food as our entry point to understanding.

During our Knowledge Makers workshop, Dr. Sereana Naepi (2023) spoke about service and stewardship to our community. Hearing about other projects in our cohort made me question whether I could and should continue with the program. While others are in a position to amplify the beautiful stories around their food and knowledge systems, I am not. I spent a lot of time reflecting on what it would mean to be in the greatest service of my community and how to be the best steward of the knowledge and the relationships I hold. What emerged from that period of reflection is that the

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-Ryann Monteiro

best way I can serve my community is to protect it while we navigate our healing process. If I had decided to interview members of my community about our traditional food and knowledge systems, I would be participating in the very extractive knowledge system that we (Indigenous peoples) criticize. To participate in this extractive process during my time with Knowledge Makers would be a direct contradiction to the values that Knowledge Makers centers, as well as my moral compass.

I feel strongly about using this space as an opportunity to protect Wampanoag knowledge because the start of colonization was the start of the exploitation of traditional ecological knowledge. This experience is not unique to Wampanoag people. Indigenous knowledge allowed white settlers to survive (Drahos, 2014). In the Wampanoag context, it is well documented that the Pilgrims would not have survived the winter if our ancestors had not shown them how to plant corn. If they had not shared what we had learned from the land and with the land. Now, the very sacred food that we shared is not even grown in our ancestral homelands.

Resisting the Commodification of Indigenous Knowledge

In the words of LaPier (2017), there are storytellers and storytakers. Indigenous knowledge quickly becomes commodified when it is shared at the wrong time, from the wrong messenger, without its proper context. As an Aquinnah Wampanoag woman, it is my responsibility to my community to be able to discern what is shared, when, and by whom. I started this article with the journey to Noepe because being an off islander has political and social implications. Colonization has left a legacy of distrust among all people, Wampanoag or not. Relationships to land and each other have been strained among those who stayed, those who chose to leave, and those who were forced to leave. Amid our healing process, it would be irresponsible for me to ask my community members to share stories with me to feed the desires of non-Indigenous people

who are hungry for our stories but not our sovereignty.

In order to not perpetuate the commodification of Indigenous knowledge, one must acknowledge that there is a time and place for everything. Indigenous time, place, and space exists in a different paradigm than Western culture. The tension I feel in wanting to participate in the Knowledge Makers program and my strong conviction to protect Wampanoag knowledge is the power component that Ratuva (2009) argues exists between Western science and local Indigenous knowledge. I feel the demand of Western academia to write this article now and ancestral guidance to say, “not now and not through this medium.” It is important that my resistance is not silent but is understood. To say that we, Wampanoag people, are still here but do not answer to demands disguised as opportunity. This is not a critique of Knowledge Makers but a critique of academia as a whole. The opportunity for publication at the cost of community preservation is a price I am not willing to pay. Reflecting on the work of Ratuva (2009), I find myself operating on the basis of accommodation and the basis of contradiction. This article is my negotiation of these bases, to immortalize my writing as resistance at this point in time.

Resistance and Recovery

In recognition that Indigenous resistance will always exist as long as the settler colonial agenda does, it is important to make clear that Indigenous resistance is not the sole purpose of our existence, nor should it be. However, it is important to acknowledge that colonization sought to disrupt and destroy sacred circles and the relationships that connect us to our land and our relatives, both human and nonhuman. We are actively healing these relationships, but it takes time. This process is not linear and does not solely exist in the natural world. It is not to say that Wampanoag knowledge will never be shared in the public domain or through scholarly articles. Those resources do currently exist, and it is possible that at some point in time that our knowledge

will become more widely known and shared. It is simply that Wampanoag people deserve to retain the ability to discern what to share, when to share, with whom, and through what medium. Thank you for joining us on this journey to upholding sovereign land and sovereign knowledge, I am sure our paths will cross again.

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Coyote Brings the Food Conference - ©OKGN.Co/Beth Taylor

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BUILDING A COMMUNITY-BASED PARTICIPATORY FOOD SYSTEMS APPROACH TO INDIGENOUS FOOD SECURITY AND FOOD SOVEREIGNTY

Who I Am

Taanishi, Shannon Udy dishinihkaashoon. Hello, my name is Shannon Udy. I am a Métis woman with Métis and mixed European ancestry. My Métis roots are from my grandmother, Iona Ouellette, a descendent of the Métis People of the Red River Settlement (in present-day Manitoba, Canada). Like many Métis People, my ancestors were forced to deny and hide their Indigeneity to escape racism and discrimination. It was not until my early adulthood that my grandmother felt safe to share our family's heritage. For over half a decade I have been on an ongoing journey to understand and reconnect with my own cultural identity as a Métis woman through my grandmother's teachings and stories, the recorded history of my ancestors, language learning, and engaging with my Métis community. I was raised on Vancouver Island, Canada, as an uninvited but grateful visitor to the unceded lands of the **Lək'wəḡən** Peoples and the Ligwílda'xw Peoples. I am a citizen of the Métis Nation of British Columbia and belong to the North Island Métis Association, my local Métis chartered community.

My aspiration to become a Registered Dietitian brought me to McGill University in my early adulthood to pursue a B.Sc. in Nutritional Sciences – Dietetics. Since then, I have been based in Tiohtià:ke/ Montréal, Québec, situated on the traditional territory of the Kanien'kehá:ka (Mohawk) Nation. During the final year of my undergraduate program, I was invited by Kanien'kehá:ka scholar and McGill University faculty member Treena Delormier to join the Kahnawà:ke Schools Diabetes Prevention Program (KSDPP), a 29-year-old community-academic research partnership aiming to prevent type 2 diabetes in the Kanien'kehá:ka community Kahnawà:ke, Québec. KSDPP is a community-based participatory

research program with a high degree of community involvement and ownership (Salsberg et al., 2017; Tremblay et al., 2018). It is a research and training centre providing academic training for master's, doctoral, and postdoctoral students interested in Indigenous health. KSDPP also engages in food security and food sovereignty initiatives in Kahnawà:ke as part of its diabetes prevention vision. During my time as a KSDPP undergraduate research trainee, I fortunately become involved in food security and food sovereignty community initiatives in Kahnawà:ke where exposure to community-based participatory research shaped my developing perspective of research and its potential for Indigenous Peoples' health. I gained an awareness of how research can effectively respond to community priorities and underlying social inequities by supporting Indigenous ownership and governance of research and health promotion efforts anchored in Indigenous culture and values. This experience inspired me to pursue graduate studies following my B.Sc. I am currently completing my master's research and training in partnership with KSDPP to contribute to community food security research needs while continuing to develop my knowledge and skills in public health nutrition, community-based participatory research, and Indigenous health. I position myself as an Indigenous woman (Métis, Red River Settlement) (re) learning many aspects of where I come from, who I am, and where I am going. In a few ways I consider myself an "insider" to my topic as an Indigenous dietitian but in other ways, I am an "outsider" as a guest who is doing research with Kahnawà:kehró:non (people from the Kahnawà:ke community).

Introduction

The COVID-19 pandemic heightened challenges and concerns for ensuring that all Kahnwa'kehró:non could access enough healthy, safe, and culturally appropriate food. Kahnawà:ke's Food Security and Food Sovereignty Working Group arose amid the pandemic to support community mobilization efforts and provide emergency food services, while recognizing an ongoing need to address community food security and food sovereignty priorities. I was invited to participate in this inter-organizational working group as a KSDPP research trainee where group discussions emphasized the need to consider the role of the community food system in planning wholistic and coordinated food security and food sovereignty action strategies. This paper presents a participatory food systems approach to community food security and Indigenous food sovereignty in Kahnawà:ke. The approach bridges Indigenous and Western research and planning methodologies to identify and explore community food system priorities and the complex system of factors structuring equitable food system outcomes, oriented toward planning strategies for systemic change. Few papers have elaborated how to respectfully bring together multiple methodologies to address community research needs in a manner that prioritizes Indigenous knowledge and ways of knowing, cultural practices, and values and promotes community self-determination and empowerment in the context of food security and food sovereignty research and planning. The remaining sections of this paper will describe the methodological approach designed for our study, tracing our engagement and application of the methodologies and methods it encompasses. It will then discuss essential features that interlace the strengths of Indigenous research and planning methodologies, community-based participatory research, and community-based system dynamics, emphasizing bridging concepts to practice for Indigenous food security and food sovereignty research and planning.

Community and Research Context

Kahnawà:ke is situated on the south shore of the Saint Lawrence River, approximately 15 kilometers from the city of Montréal. Kahnawà:ke is home to approximately 8,079 residents (Indigenous Services Canada, 2023). It is one of eight territories that make up the Mohawk Nation and is part of the Haudenosaunee or Six Nations Iroquois Confederacy (Kahnawake Longhouse, n.d.). Presently, Kahnawà:ke relies largely on food produced outside the territory;

however, an increasing number of Kahnwa'kehró:non are returning to planting, producing food, and continuing cultural food practices that reflect traditional relationships and responsibilities (Delormier et al., 2017). Food security is acknowledged locally as a key social determinant of health and a community priority connected to Kahnawà:ke's greater food sovereignty movement and efforts to reclaim community governance of the food system. Kahnawà:ke's food security and food sovereignty is supported through an extensive health and social services infrastructure, grassroots initiatives, and community-governed research capacity.

Since becoming a KSDPP research trainee I have formed key relationships, and an essential understanding of community needs and values which form the basis for my master's research project. This study is marked by a collaborative research partnership in which ownership of the research process is shared, and for this reason, I choose to refer to this study not as mine but ours. The idea for our study arose within current community efforts to build food security and Indigenous food sovereignty. It is grounded in a community-identified need for a comprehensive approach to guide planning for food security and food sovereignty actions. The purpose of our study is to develop a values-based vision and shared understanding of Kahnawà:ke's food system using a food systems approach to community food security and Indigenous food sovereignty. Our study proposes a novel participatory food systems approach that weaves Indigenous research and planning methodologies, community-based participatory research, and community-based system dynamics to answer the following three questions:

1. *What is Kahnwa'kehró:non's vision for a hoped future for their food system?*
2. *From a systems perspective, what is Kahnwa'kehró:non's understanding of current food system priorities? and*
3. *What are opportunities for systemic actions impacting current food system priorities identified by Kahnwa'kehró:non?*

Our study design recognizes that solutions to promote food security and food sovereignty must be wholistic, strength-based, and prioritize community needs, knowledge, values, practices, and worldview. At the time of writing this paper, our study is entering the initial stages of data generation.

The Need for a Community-Based Participatory Food Systems Approach for Indigenous Food Security and Food Sovereignty

Food security is an important public health issue in Canada because nutrition, health, and well-being are closely linked to food security status (Jessiman-Perreault & McIntyre, 2017; Kirkpatrick & Tarasuk, 2008; Melchoir et al., 2021; Men et al., 2020; Tait et al., 2018). Food security exists “when all people, at all times, have physical and economic access to sufficient, safe and nutritious foods to meet their dietary needs and food preferences for an active and healthy life” (Food and Agriculture Organization of the United Nations [FAO], 1996, action 1). In contrast, food insecurity means that food access or availability is insufficient. Indigenous Peoples are disproportionately burdened by food insecurity and poorer health outcomes, including multiple nutrition-related chronic diseases (Andersen et al., 2016; Batal, Chan, Fediuk, Ing, Berti, Mercille, et al., 2021; Egeland et al., 2010; Rosol et al., 2008; Tarasuk & Mitchell, 2019; Willows et al., 2011).

Dominant approaches of conceptualizing and addressing food security tend to focus on people’s economic and physical access to food from market (commercial) food systems at an individual or household level (Loopstra, 2018). Such approaches fail to acknowledge the protective factors of Indigenous Peoples’ food systems (Power, 2008), which refer to foods harvested locally that are sustained by cultural values, knowledge, and practices (Kuhnlein & Receveur, 1996). Indigenous Peoples’ food systems are significant and essential to community food security, providing sustainable, high quality, nutritionally dense, and culturally preferred foods (Batal, Chan, Fediuk, Ing, Berti, Sadik et al., 2021ab; Kuhnlein, 2015), in addition to being an integral part of Indigenous culture, identity, and well-being (Blanchet et al., 2020; Delormier et al., 2017; Egeland & Harrison, 2013). Access to traditional foods, lands, and resources for which Indigenous food systems are based has rapidly declined because of colonization (FAO, 2021). However, many Indigenous communities are reclaiming their food systems and food security through a food sovereignty approach (e.g., Delormier & Marquis, 2019; Sowerwine et al., 2019).

Indigenous food sovereignty is an approach of achieving community food security by reclaiming the

decision-making power within local food systems (Morrison, 2011). It advocates for the revitalization of Indigenous food systems, emphasizing the self-determination of distinct Indigenous groups to define their own food systems (Settee & Shukla, 2020). While expressions of Indigenous food sovereignty take varying forms, it is recognized as a rights-based, decolonial, and community-led approach to restoring culture, environments, governance, food security, and health (Blue Bird Jernigan et al., 2021, Grey & Patel, 2015; Sampson et al., 2021).

Given the persistent inequities in food insecurity rates for Indigenous communities, and the importance of community-led efforts to act upon this determinant of health, community food security and Indigenous food sovereignty call for long-term, systematic, and wholistic approaches. This paper offers researchers, public health practitioners, and Indigenous communities a new participatory food systems approach to community food security and Indigenous food sovereignty that supports desired community food system planning and collective action.

Food Systems Approach

A food systems approach is a promising framework for exploring various food system components and their relationships to address complex issues and achieve systemic changes (Nguyen, 2018). By applying systems science and systems thinking concepts and methods, it moves beyond reductionist thinking to account for system complexity, recognizing that outcomes (e.g., equitable access to food) emerge from a system as a whole (Clancy, 2022). Reductionist thinking pertaining to food system challenges results in siloed approaches and isolated interventions focused on technical fixes (Ingram, 2011; Nguyen, 2018). A food systems approach emphasizes broadening perspectives to consider the many related interacting factors that shape food system outcomes over time and to coordinate multiple actions to address root causes (Nguyen, 2018). In recent decades, food systems approaches have been increasingly used at national and global levels to understand and plan actions for environmental change, food security, nutrition, and social equity (Brouwer et al., 2020). Using a food systems approach, the food system is initially assessed to provide an analytical base whi-

ch serves to foster discussions and guide context-specific action planning for desired food system outcomes (Ingram, 2011). Further, it can support a vision, balanced across a set of shared values, to guide a process of food systems change and “to inspire, mobilize, and keep a collective of people on track toward their goals” (Anderson, 2019, p. 55).

The current application of a food systems approach is variable in scale and quality with little attention to local food systems change, stakeholder engagement, and research power dynamics, and with inconsistent use of systems concepts and methods geared toward wholistic interventions (Brouwer et al., 2020; Clancy, 2022; Waterlander et al., 2018). It has had sparse application to the distinct food systems and efforts of Indigenous communities to reclaim their food systems. Existing published literature using a food systems approach to food security with Indigenous communities comes from research conducted in a remote Australian context using a participatory process and tool (Brimblecombe et al., 2015). Limitations included an inability to elucidate linkages and feedbacks between various areas of local food systems. Authors of this work suggest further use of participatory, structured approaches to promote collaboration between food system sectors and community groups (Rogers et al., 2018). Group model building is a suggested systems approach with potential for further work in this area (Brimblecombe et al., 2017).

Group Model Building

Group model building is a participatory systems science method where stakeholders engage in building a system dynamics model to represent their shared understanding of a complex system issue (Hovmand, 2014). System dynamics models help stakeholders visualize and analyze the system structure and relationships underlying a complex issue and explore potential interventions (Gerritsen et al., 2020). Group model building has been used across multiple disciplines, including public health and health promotion projects in diverse contexts (Carey et al., 2015; Saryazdi et al., 2021; Zukowski et al., 2019). It has demonstrated potential to align with Indigenous ways of knowing, being, and doing when culturally adapted (Browne et al., 2021; Heke et al., 2019; LaVallee, 2014). A recent study using group model building in Hawke’s Bay, New Zealand demonstrated meaningful community engagement in a manner consistent with an Indigenous (Māori) worldview by collaboratively mapping the food system and identifying interventions to improve children’s

nutrition (McKelvie-Sebileau, Gerritsen et al., 2022). Growing interest in applying systems approaches to address the conditions underlying health and social inequities in public health (Carey et al., 2015; Zukowski et al., 2019) is evoking innovative approaches and opportunities for researchers and Indigenous Peoples seeking to enhance community health through systemic change (Hernández et al., 2017). However, no published articles to date explore how a food systems approach can be used in research and practice for and with Indigenous Peoples for the purpose of community food security and Indigenous food sovereignty planning.

A Community-Based Participatory Food Systems Approach for Indigenous Food Security and Food Sovereignty

Indigenous Research and Planning Methodologies

Indigenous research and planning methodologies are grounded in relationality, the ontological understanding that the world is constituted in relationships (Matunga 2013; Wilson, 2008). Guided by *relational accountability*, or being accountable to *all my relations* when doing research, a research methodology is an important process for cultivating relationships that are respectful (to the research topic, oneself, community partners, participants), honour responsibilities (roles and obligations in research and ethics) and nurture mutual reciprocity (contributing to research relationships and to the generation and sharing of knowledge) (Wilson, 2008). Indigenous research paradigms recognize that knowledge is a shared, not individual or owned, endeavour, both in its creation and application. Relational accountability refers to the ways in which researchers fulfill their responsibilities to the relationships that are established when conducting research in partnership with an Indigenous community (Wilson, 2008). Relational ways of doing are reflected in each step of a research process through respectful collaboration (e.g., determining the research question, methodology, and methods; generating, analyzing, and interpreting data; and in the dissemination of findings) (Wilson, 2008). In the context of Indigenous planning, a research methodology serves as a future-oriented process and expression of self-determination connecting people, place, knowledge, values, and worldview, with decisions and action to promote community health and well-being (Matung

-ga, 2013) Indigenous planning also centres intergenerational relationships as they connect past values and practices with the everchanging present, all in the context of planning for the future (Jojola, 2013).

This participatory food systems approach aligns Indigenous and Western research and planning methodologies. Bridging Western (i.e., community-based participatory research, community-based system dynamics) and Indigenous relational ways of knowing and doing requires building and maintaining respectful relationships and upholding Indigenous perspectives in design, implementation, and analysis processes (Elliot et al., 2012). Two-eyed seeing, proposed by Mi'kmaw elders Albert and Murdena Marshall, is an approach to inquiry for bridging multiple ways of knowing (Hill & Coleman, 2019). Two-eyed seeing is “the ability to see with one eye the strengths of Indigenous ways of knowing and with the other eye the strengths of Euro-Western ways knowing and using both of these eyes together” (Vukic et al., 2012, p. 148). In our study, we also take guidance from Two Row wampum teachings from the earliest treaty between Haudenosaunee and early settlers (Hill and Coleman, 2019). The treaty uses the metaphor of two vessels traveling the river of life, a ship representing settler culture and ideologies, and the other a canoe holding Haudenosaunee laws and ways of living which are respectful and balanced with nature. The vessels are depicted on the wampum belt as two parallel rows of purple beads on a white background, showing non-interference in each other's ways. Applied in research, we respect that distinct Indigenous and Western research paradigms can coexist harmoniously. Two Row research entails creating spaces where distinct and diverse perspectives can engage in respectful dialogues, value knowledge as co-created and shared, and oriented to upholding responsibilities to the gifts of creation and considering the well-being of future generations (Hovey et al., 2017; Freeman & Van Katwyk, 2020). Two Row teachings and two-eyed seeing offer guidance for fulfilling relational responsibilities in the research and planning processes; the KSDPP Code of Research Ethics and community-based participatory research offer a culturally relevant framework of community engagement and collaboration between myself (the researcher) and the community of Kahnawà:ke; and community-based

system dynamics offers a set of adaptable methods and tools to enable the systemic exploration of the relationships, interconnections, and factors structuring community food system priorities. Through building and maintaining respectful and collaborative relationships, the participatory processes integrated in this food systems approach prioritize Indigenous knowledge and meaningfully integrate cultural practices and values throughout the research process. For instance, the present study will integrate community practices for visioning, ceremony, and knowledge sharing, and respect core cultural values such as youth and elder involvement, collective thinking, and considering future generations under the KSDPP Code of Research Ethics (KSDPP, 2023).

Community-Based Participatory Research

Our study is embedded in current community efforts among various programs and groups working to enhance food security and Indigenous food sovereignty in Kahnawà:ke by responding to the community-identified need for a planning approach to guide collaborative and collective community action. Initial support for the research idea emerged during the summer of 2021, prior to engaging in the research project, through actively participating in ongoing discussions and consultation meetings with Kahnawà:ke's Food Security and Food Sovereignty Working Group. The idea was then further developed into a proposed research project that was presented to the KSDPP for review and approval. Our study follows the KSDPP Code of Research Ethics, which outlines a set of collaborative and ethical principles, procedures, obligations, and rights to guide academic and community research partners throughout the research process (KSDPP, 2023). The code asserts Kahnawà:ke's self-determination and expertise in research and in creating knowledge for the well-being of future generations of Kahnawà:kehró:non, which it bridges with community-based participatory research principles.

Community-based participatory research is an orientation to research that seeks to engage researchers and community members as equal partners pursuing a common purpose of creating knowledge and social change (Israel et al., 2013). Community-based participatory research is a valuable approach for research with Indigenous Peoples, emphasizing the importance of building and nurturing collaborative,

respectful, and reciprocal relationships among partners, balancing power differences within the research process, and ensuring community self-determination and empowerment (Tobias et al., 2013). Collaboration and active involvement of community partners are the heart of a community-based participatory research approach. Collaboratively developing, implementing, learning from, and acting on research with a community enhances its relevance and the credibility and applicability of the results (Macaulay et al., 1999). Community collaboration has taken place through the initial stages of our study and will continue through the KSDPP's Review and Approval Process for Ethically Responsible Research which is governed by the Community Advisory Board (community partner) and the Research Team (academic partner) (Delormier et al., 2015). Community-based participatory research guides the research design through creating and engaging the dedicated participation of a workshop planning team (known as a core modeling team) and involving community participants in all stages of data generation and analysis by design.

Community-Based Food System Dynamics

A food systems approach considers the whole food system and its interconnected components interacting over time. The approach is rooted in systems science and systems thinking which recognize that a complex system and issues embedded within it cannot be understood in view of isolated parts (Clancy, 2022; Story et al., 2009). Food systems function and interact at multiple scales ranging from local to global. Local food systems are diverse and place-based; however, most food systems approaches lack emphasis on community-based food systems and the participation of local stakeholders in determining solutions to community-identified issues within their specific contexts (Brouwer, 2020; von Braun et al., 2021). Systems science and community-based participatory research offer diverse complementary approaches and methods (Frerichs et al., 2016), and integrating the two has increasingly been applied for the purpose of understanding and addressing social and health inequities (e.g., BeLue et al., 2012; Freedman et al., 2022). Community-based system dynamics is one such approach that uses participatory group model building to engage community members in creating their own system dynamics models for understanding and visu-

alizing systems, and designing strategies for desired systems change (Hovmand, 2014). Community-based system dynamics is a promising approach for involving community members in a food system modeling process to promote systemic change (Glickman et al., 2022). It places a particular focus on growing community capacity in systems thinking and system dynamics modeling by using collective learning processes to promote collaboration and ownership around a model and generate insights for mobilization (Hovmand, 2014).

Community-based system dynamics uses group model building workshops to develop system dynamics models of a complex issue in partnership with community members (Hovmand, 2014). Causal loop diagrams are a tool from system dynamics modeling that help visualize the components of a system structuring a priority issue and represent their relationships with one another using lines, arrows, and feedback loops (Zukowski et al., 2019). Developing causal loop diagrams with community stakeholders facilitates dialogue and builds consensus on how a system is structured and how to intervene (Hovmand, 2014). Community members analyze causal loop diagrams qualitatively by describing the structure, subsystems, and feedback loops that are identified in this process. Community-based system dynamics projects typically involve three components: 1) problem scoping in which the issue to be modeled is identified; 2) core modeling team planning for the design and implementation of group model building workshops; and 3) group model building with community participants (Hovmand, 2014).

Our study proposes participatory visioning involving diverse participants representing unique perspectives on the community food system. This approach aims to build consensus on a hoped future for the community food system and identify a priority issue that will become the focus of group model building workshops. Our decision to design visioning as a first step in this participatory planning process arose from meetings with key community members and KSDPP's Community Advisory Board. Community members expressed the importance of including community planning practices and broad community participation in defining food system priorities. Participatory visioning has been integrated as a novel and culturally relevant problem scoping method. Following a community visioning workshop, a group model building process will be used to operationalize a food systems approach by co-creating a food system model (causal loop diagram)

Visioning and Group Model Building Workshop Core Activities and Outputs

| Activity | Description | Outputs |
|--|--|--|
| Creating a Shared Vision | Participants write vision reflections on paper as words, statements or drawings and are invited to share in small and full group discussions. Participants and core modeling team work collaboratively to identify themes. | <ul style="list-style-type: none"> • Reflections organized as thematic vision clusters |
| Priority Setting | Participants identify and rank priorities for Kahnawà:ke's future food system using dot vote. | <ul style="list-style-type: none"> • List of ranked priorities |
| Presenting the Vision and Key Priority | Participants review the food system vision and priorities and ensure consensus on the priority issue the food system model will seek to address. Participants discuss how to represent trends in the priority issue. | <ul style="list-style-type: none"> • Graph depicting changes over time and hoped and alternate scenarios for the future |
| Graphs Over Time | Participants brainstorm food system factors influencing the priority issue and how they have changed over time. | <ul style="list-style-type: none"> • Graphs of candidate factors for connection circles |
| Connection Circle | Participants map factors that influence the priority issue; linkages are drawn between factors. Participants complete connection circles in groups and discuss with the entire group. | <ul style="list-style-type: none"> • 1 connection circle per group |
| Causal Loop Diagram | Participants are guided in expanding upon linkages in connection circles, adding positive or negative directionality, and connecting feedback loops. Participants complete causal loop diagrams in groups and discuss with the entire group. | <ul style="list-style-type: none"> • 1 causal loop diagram per group |
| Model Review | Consolidated causal loop diagram, themes and descriptions are shared with participants for feedback and revision. | <ul style="list-style-type: none"> • Validated causal loop diagram and themes |
| Action Ideas | Participants identify opportunities for action, share insights and prioritize actions along a priority matrix. | <ul style="list-style-type: none"> • List of prioritized opportunities for action |

Table 1. Visioning and Group Model Building Workshop Core Activities and Outputs

to visually depict a shared understanding of Kahnawà:ke's food system with a smaller group of community stakeholders with diverse roles, expertise, or interest in the priority issue. The food system model will subsequently be used to identify opportunities (actions) to intervene with the system to impact current food system priorities through systems change. Community visioning and group model building workshops and activities will integrate general participatory visioning (Jojola, 2013; Umemoto, 2001; Walzer & Hamm, 2012; Wiek & Iwaniec, 2013) and group modeling building principles and structure (Gerritsen et al., 2020; Hovmand, 2014, Hovmand et al., 2015), guided by culturally relevant food system, food security, and food sovereignty concepts and literature. Further details are found in Table 1. The participatory process aims to foster community ownership and sustainability for food security and food sovereignty planning and action in Kahnawà:ke by growing community capacity in systems thinking and group model building. Therefore, this study will use a community-based system dynamics approach to respond to the research questions, since it values integrating the perspectives, knowledge, and experiences of a diverse group of community members about their food system through participatory community visioning practices and group model building workshops.

A Community-Based Participatory Food Systems Approach in Practice

This section presents essential features offered as principles that weave the strengths of Indigenous and Western (community-based participatory research, community-based system dynamics) research and planning methodologies to demonstrate to researchers, public health practitioners, and Indigenous communities the potential of a participatory food systems approach for community food security and, Indigenous food sovereignty. I discuss how these features can guide the practice of research and planning for Indigenous Peoples' food systems, community food security, and Indigenous food sovereignty. While each feature underlying this participatory food systems approach is discussed separately, it is important to recognize that they are interconnected, interdependent, and synergistic.

Participatory

Foundational is the equitable and full participation of community members at each stage of the research and planning process. Deeply rooted community participation brings to the forefront community voices on key priority issues that will ultimately impact people in their daily lives (Israel, 1998). In practice, this means ensuring community members have opportunities for involvement in all aspects of the research. In our study, community partners have participated in key decision making regarding the research topic, objectives, and study design. Community discussions and consultation meetings with Kahnawà:ke's Food Security and Food Sovereignty Working Group helped shaped the research topic and objectives to directly support community needs and priorities. The study was also presented, reviewed, and approved by KSDPP's Research Team (for scientific rigour and feasibility) and the Community Advisory Board (for cultural relevance and benefit to the community). Community participation is also realized through engaging a core modeling team who will share the responsibilities for the design, planning, recruitment, facilitation, and analysis of community group workshops (Hovmand, 2014; Richardson & Andersen, 1995). Each team member will fulfill an important perspective and role in the design and convening of community workshops: substantive, methodological, logistical, and community voice (Ballard et al., 2020). The core modeling team is an essential element of this community-led planning process that helps ensure community visioning and group model building workshops and activities are responsive to the local and cultural context. Collectively, participatory visioning and group model building workshops engage community members in understanding, analyzing, and planning actions toward community food system priorities of which they are experts. Community members also participate directly in data analysis and validation of the findings through vision and model review activities embedded within community workshops.

Wholistic

This participatory food systems approach reflects an understanding that Indigenous Peoples' food systems do not align with prevailing food systems conceptualizations as linear value chains (FAO, 2021).

Rather, Indigenous Peoples' food systems are biocentric and relational, encompassing diverse food generation and production, processing, distribution, and consumption practices that are sustaining for future generations and shaped by and interconnected with nature, spirituality, ancestral knowledge, sociocultural values, and evolving ways of life (Kuhnlein & Receveur, 1996; FAO, 2021). Within the literature, systems science and systems thinking approaches hold parallels or intersections with the wholistic and system-based worldview of many Indigenous Peoples (Browne et al., 2021; Goodchild et al., 2021; Heke et al., 2019; LaVallee, 2014, McKelvie-Sebileau, Pekepo et al., 2022). While these parallels or intersections have seldom been explored in detail, the literature suggests that systems thinking and participatory system dynamics approaches, with their emphasis on exploring the relationships, interconnections, and interactions of factors that make up complex and dynamic systems, align well with Indigenous ways of knowing. Systems thinking and system dynamics argue that system structure determines patterns of behaviour, that result in outcomes we see (Hovmand, 2014). When practiced from Indigenous perspectives, systems thinking and system dynamics approaches such as group model building have demonstrated value and applicability for the exploration of system structure, relationships, and patterns of behaviour using participatory system dynamics modeling processes that retain the integrity of distinct Indigenous worldviews (Browne et al., 2021; Heke et al., 2019). Shared features that bridge these distinct ways of knowing as described by researchers working in partnership with diverse Indigenous groups (e.g., Māori, Indigenous Australians, Métis) to understand and address priority issues (e.g., obesity, food security, tuberculosis) include wholism, interconnectedness, relationality, visual learning, storytelling, and honouring multiple perspectives (Browne et al., 2021; Heke et al., 2019; LaVallee, 2014, McKelvie-Sebileau, Pekepo et al., 2022). In the context of our study, a wholistic and systemic exploration of community food system priorities is achieved using group model building to create a causal loop diagram that integrates community understandings of the system structure and relationships underlying system behaviour and enables community members to collaboratively explore potential impacts of current decisions and actions in shaping community food system priorities and outcomes for

future generations.

Relational

As discussed earlier, Indigenous research and planning methodologies respect that knowledge is dependent on relationships we uphold (Wilson, 2008). This participatory food systems approach is relational not only in the relationships it fosters between academic and community partners, the research ideas it collaboratively creates, and the community food system it envisions but also in the interpersonal and intergenerational community relationships it builds in practice. Participatory visioning and group model building are complementary participatory methods that promote community collaboration, consensus building, and collective action on key community priorities. They each bring together knowledgeable community members and stakeholders interested in participating in dialogues, sharing stories, teachings, and insights, and contributing to decision-making about community food system futures and possibilities. Thus, the engagement process creates shared spaces for bringing diverse perspectives together and learning from one another, and for individuals to experience their contribution to the visioning and model building efforts, and how they can mobilize toward the desired food system. Everything in visioning and group model building is done as a group such that the knowledge, insights, and decision-making that occurs reflects the collective. These relational qualities of working as a collective and striving for consensus in decision-making remain fundamental to the cultural practices of many Indigenous Peoples who understand that supportive community relationships are fundamental to food security (Delormier et al., 2017; Delormier & Marquis 2019; FAO, 2021).

Self-Determination and Empowerment

At its core, this participatory food systems approach is about creating community food systems change by placing Indigenous Peoples and their distinct practices and values at the centre of a community-led change process. This approach respects community self-determination and empowerment. In practice, this participatory planning framework develops a values-based vision and shared understanding of community food system priorities, while generating system insights,

and community action strategies. Participatory visioning and group model building workshops generate a wholistic view of key community food system priorities that enables integrating perspectives in collective analysis that guides action responsive to local strengths, resources, and values. This collaborative and participatory process aims to mobilize collective action by building community capacity to understand and create change in the food system. Community partners and workshop participants will build or enhance their knowledge and skills in systems thinking and system dynamics approaches to support the ongoing use and development of the community food system vision, model, and shared insights. This process promotes community ownership and creates conditions to strengthen existing community relationships for sustained mobilization and collective action beyond the research. As well, to equip community stakeholders in advocating for and implementing food security and governance strategies that account for the cultural and structural context to drive desired systems change. Thus, in addition to knowledge creation, a desired outcome of this participatory approach is enhancing community empowerment to engage with the systems that shape food security, nutrition, and well-being.

Conclusion

This paper has briefly explored a participatory food systems approach to community food security and Indigenous food sovereignty designed for one Indigenous community seeking to develop a contextually grounded understanding of the factors, relationships, interconnections, and feedback loops structuring community food system priorities.

The approach facilitates community identification of key intervention points within the local food system to overcome systemic issues

contributing to food insecurity and advance a community vision of a food system and the values it reflects. The primary benefit of this study for Kahnawà:ke is to ignite and sustain a community-engaged planning process for food security and food sovereignty.

As this paper comes to a close, I would like to reflect on two anticipated challenges that researchers and public health practitioners could experience when applying this approach for and with communities that are not their own. First, is understanding that meaning is embedded in culture, history, collective experience, and language (Umemoto, 2001)

For this reason, researchers and practitioners should engage in research and planning through community partnerships and commit themselves to an ongoing journey of learning about and from a particular community, both individually and as part of a research co-learning process. Community participation in all aspects of the research, including data analysis and interpretation, can help ensure that community knowledge, experiences, and perspectives have been accurately reflected by the research findings. A second challenge is understanding the role of power (Clancy, 2022; Umemoto, 2001). Researchers and practitioners may be positioned as experts or leaders in a project and required to shift power over the design and implementation of a participatory food systems approach to the core modeling team and community partners. To equalize power differences within the research and planning process, researchers and practitioners should carefully reflect on the importance of

“Given the persistent inequities in food insecurity rates for Indigenous communities, and the importance of community-led efforts to act upon this determinant of health, community food security and Indigenous food sovereignty call for long-term, systematic, and wholistic approaches.”

- Shannon Udy

relationships as they exist through all aspects of the research process and engage with the concepts of respect, responsibility, and reciprocity to support the shift of power, knowledge, skills, and capacity to community members (Tobias et al., 2013; Wilson, 2008).

Bridging Indigenous and Western (community-based participatory research, community-based system dynamics) research and planning methodologies, this participatory food systems approach builds upon current efforts to close gaps in food security, nutrition, and well-being for Indigenous Peoples. A community-based participatory food systems approach represents a new way of thinking and addressing complex food-related issues such as community food security and Indigenous food sovereignty. It offers a holistic lens to explore the complexity of local food systems and honour the knowledge, culture, and values embedded in them. Planning and implementing contextually relevant actions to advance food security and health equity for Indigenous Peoples requires the engagement and full participation of Indigenous communities in research and planning that responds to their own needs and priorities for community health and well-being. This paper was written to offer researchers, public health practitioners, and Indigenous communities an approach aligning Western and Indigenous relational ways of knowing and doing to support community-led food system planning and change processes which elevate Indigenous Peoples' food and knowledge systems, promote empowerment, and advance equitable food system outcomes for all.

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Pacific



Molokai Northern Coast Alden Cornell Molokai Hawaii
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Joeann Walters

*Maori
New Zealand
Pacific*

CHIEFS OF OUR WHENUA

Term List

Aroha – love
 Kaum ā tua – Tribal elders
 Kaupapa – programme
 K ō rero – Content
 Kuia – Elder female
 Mahinga kai – large traditional gardens
 M ā tauranga – knowledge
 Matua – Uncle / aunt
 Mauri – life force
 Mokopuna – grandchild / young person
 Noho w ā nanga – special time of creating, making, and connection
 Papat ū ā nuku – Earth / Mother Earth
 Pepeh ā – Tribal method of introducing oneself
 Rangatira – Chiefs
 T ā ngata Whenua – Indigenous people
 T ā onga – treasured possession
 Tauihu – the front / nose of the waka
 T ē n ā r ā koutou katoa – Greetings everyone/ everybody
 Tikanga – customs
 T ū puna – ancestors
 T ū puna whenua – ancestral lands
 Whakapapa – genealogy
 Whakatauk ī – Tribal proverbial saying
 Wh ā nau – families
 Whenua M ā ori – M ā ori lands
 T ē n ā r ā koutou katoa.
 Ko Pukearengarenga te maunga t ū watawata ki tua
 Ko Te Rehuotane te maunga t ū watawata ki tai
 Ko Whakairiora te maunga e horahora nei
 Ko Horahora te awa e rere atu ki P ā taua, e rere atu ki Taiharuru, e rere mai nei ki te awa o Ngunguru!
 Ko Ngunguru te moana, ngunguru i te ao, i te p ō .
 Ko Paratene Te Manu te Wharenuui
 Ko Manaakitia e Te Iwi te Wharekai
 Ko Ngunguru te Marae
 Ko Ng ā ti Taka, Te Waiariki me Ng ā ti Koror ā ng ā hap ū

Ko Ng ā tiWai me Ng ā Puhi ng ā Iwi.
 Oti r ā , nei te whakamihi atu ki a koutou katoa e ng ā Iwi Taketake o te Ao!

Introduction

T ē n ā r ā koutou katoa – Greetings, my name is Joeann Walters. I am honored to be a part of this programme as facilitated by the sacred Knowledge Makers and Elders. I am thankful to be able to share my voice amongst the many Indigenous voices as shared in previous editions of the Knowledge Makers Journal. The k ō rero that is expressed in this paper is derived from the teachings of my father – the Late Rev Wati Walters and of my mother - Margaret (Mau) Walters; from my kaum ā tua and in particular, my Matua- Taipari Munro. I also draw upon my experience working in the M ā ori Land Court for several years where I cultivated my knowledge with regards to M ā ori Land processes.

For the purposes of this paper, I have begun with my Pepeh ā . This Pepeh ā represents my grandmother's people who are the Ng ā ti Taka, Te Waiariki and Ng ā ti Koror ā tribes who reside in the areas of Ngunguru, Tutuk ā k ā , Horahora and P ā taua located on the east coast, about forty-five minutes from the main town of Whangarei in the upper part of the North Island of Aotearoa/New Zealand. It is also reflective of where I currently reside. We live on our t ū puna whenua found in a small sea coastal town of Ngunguru, which are the remaining lands held collectively by members of our tribe(s), in particular of Ng ā ti Taka and Te Waiariki.

I also belong to the tribes of Te Wh ā nau Whe-ro, Te Akitai and Ng ā ti Rehua, my grandfather's peo-

ple, whose lands are located further up the north coast in a small seaside village called Whananaki (an estimated hour from Ngunguru). These are some of the lands that have been passed down to me by my father, who in turn derived these precious lands from our tūpuna/ancestors. It would be very remiss of me if I did not mention my mother's people, who are the tribes of Ngāti Rangi, Ngāti Moerewa, Ngāti Mahia, Ngāti Tautahi, Ngāti Tipa, Ngāti Korokoro and Te Roroa. These tribes are located in the lands of Kaikohe and Hokianga further up the North Island. The tribes I have mentioned are part of the rich tapestry of tribes found within Te Taitokerau – the top half of the North Island interwoven by Whakapapa (genealogy). Hence, I come from a long line of chiefs within the largest tribe in Aotearoa/New Zealand – Ngā Puhi-Nui-Tonu who collectively with other tribes, form the Tāngata Whenua/Indigenous People of Aotearoa/New Zealand.

Whenua Māori/Māori Land

The theme of this paper is Whenua Māori/Māori land and its importance to Māori. The whakataukī as follows describes the importance and deep-rooted connection that we have to our whenua and without it, we cannot produce food to sustain ourselves: “Te toto o te tangata he kai, te oranga o te tangata, he whenua, he oneone,” which translates to “While food provides the blood in our veins, our health is drawn from the land and soil.”

Whenua is the most important living organism, that underpins the people, language, identity, mātauranga, and tikanga. The above whakataukī talks about food which provides the blood in our veins – important for our body to function. However, when we go beyond food to the whenua, the source of our wellbeing, this then draws me to conclude that it is the whenua wherein is our wellbeing and health stem from; and that there is a reciprocal relationship of responsibility and obligation to treat the whenua/land with respect and care. Much of our knowledge can be drawn from our land, soil, and water. The way in which we relate, connect and work with our whenua creates a relationship which is founded on Whakapapa. The whenua is Papatūānuku of whom we as the Tāngata Whenua can claim genealogical descent from. It is Papatūānuku who nourishes us, and we must reciprocate in a similar manner.

Whenua, like all things, has a mauri/life force, that only we as the Tāngata Whenua can ignite and activate, because we are descended from Papatūānuku. Successions of generations have lived, worked, have been nourished, and are buried in their whenua. This

ultimately places a responsibility on each generation to continue to maintain, develop, protect, and care for the whenua in life and death, which in turn increases the mauri of the whenua, thereby ensuring Papatūānuku is still intact for future generations.

The term Māori Land has been coined to differentiate the status of all lands within Aotearoa/New Zealand – General or Māori. Both have legislative frameworks that stem from its historical imposition in the early 1860s like that of the Native Land Act of 1862 to the current legislation – Te Ture Whenua Māori Act of 1993 (New Zealand Acts as Enacted, n.d.; S4). General land is dealt with under the Land Transfer Act and has another an additional set of rules and regulations in with which to comply with (Taonga Māori, n.d.). General land can be owned by anyone, as opposed to Māori land which can only be succeeded to by those with toto Māori/Māori blood, and who Whakapapa to the land (Taonga Māori, n.d.).

Māori Land issues are dealt with in its own Court system, namely the Māori Land Court with its own Chief Judge(s) – Appellate Courts, Māori Land Court Judge(s), Court Clerk(s), Registrar(s), and Case Manager(s). Its legislative authority comes from a number of Acts and Regulations, namely Te Ture Whenua Māori Act 1993, including its amendments to date. It has been noted stated by some that the Māori Land Court is the “poor cousin” of the District Court – indicating that there is more resource are more resources put into the District Court than that of the Māori Land Court. When comparing the fiscal budgets of both courts, this does hold true; the District Court and Ministry of Justice receive hundreds of millions of dollars each fiscal year, while the Māori Land Court receives tens of millions (Ministry of Justice, 2023; Ministry of Justice, 2022). In the 2023 to 2024 fiscal year, the Ministry of Justice will be investing approximately \$310 million dollars into the District Court system, spread across numerous initiatives and improvement projects (Ministry of Justice, 2023). While there are no projected numbers released for the Māori Land Court at this time, a comparative average of funding allocated to the court over the past nine years (from 2012 to 2021) suggests that the allocated funding will be in the ballpark of \$30 million dollars (Ministry of Justice, 2022). However, the fees for engaging with the Māori Land Court and the filing of applications is far less expensive than those of the District Court, not that that should detract from the responsibility of the New Zealand Crown and Government to better resource fund and equip the Māori Land Court.

In 2014 the then Minister of Māori Affairs, the Honorable Flavell of the Māori Party set about to amend the Te Ture Whenua Māori Act 1993, to allow for better utilization and management of Māori Land. A series of nationwide discussions and consultations were held with Māori Landowners, Māori Land Trusts, beneficiaries, and stakeholders to help inform, shape, and recommend changes and amendments to the Te Ture Whenua Māori Act 1993 (April 2014 Māori Law Review, 2014). This paper will not discuss the changes and the effectiveness of those changes, if any. However, it was at this point that the kaupapa based Māori Programme - “He Waka Tauihu e Pareparea Ana: Navigating Māori Land Processes” was designed and implemented by the writer of this paper.

He Waka Tauihu e Pareparea Ana: Navigating Māori Land Processes

This kaupapa/programme came in the form of a dream. In 2015, I designed, wrote, and implemented this programme with financial assistance from the Te and, New Zealand (see Figure 1). The name “He Waka Tauihu e Pareparea Ana: Navigating Māori Land Processes” has a direct connection to a beautiful coastal block of whenua called Pareparea on the east coast – an hour from Whangarei. I belong to this land and I am a current shareholder within this block. Our tribal narrative tells the story of the Mataatua Waka with Puhimoanariki on board (an eponymous tupuna of Ngā Puhī), exploring the east coast of the upper North Island until he came into our waters, and because he had to navigate around the rocks and inlets, Puhimoanariki named this bay – Pareparea, meaning to navigate the jagged rocks. The word Tauihu means the front or nose of the waka, which when put together – “He Waka Tauihu e Pareparea ana” reflects the navigational exploration and search for Whenua. Such is the nature of this programme, designed to assist whā nau/families to navigate, explore, search and understand Māori Land processes, with a view to position themselves for improved engagement and better utilisation of their Whenua Māori. The delivery consisted of a 36-week programme delivered via three, twelve-week blocks, teaching whā nau about the nature of Māori Land; the functions of the Māori Land Court, its history, and Māori customary land tenureship; how to engage, and research When-

ua Māori found within the Māori Land Court records; how to complete applications of Succession – intestate or testate; how to constitute Māori Land Trust(s); how to complete applications for occupations, dwelling sites, papakāinga – development of land, housing projects, Mahinga kai/large traditional gardens, water sources, alternative energies, including how to search in the NZ Archives, Research Libraries for their tūpuna (land documents). The programme also went as far as reconnecting whā nau (who have not been back to their ancestral lands) with their whā nau who are living on the land. Figure 2 showcases some of these families.

Essentially “He Waka Tauihu e Pareparea Ana: Navigating Māori Land Processes” is an undercover decolonization programme – which is “mind altering” resulting in whā nau making major changes whilst on the programme! It takes whā nau on a journey back in time of discovery, pain, aroha, joy, tikanga, Te Reo Māori, frustration, sadness, celebration and much more! The programme facilitated whā nau in a safe space to unpick layers of documentation and transactions from the current status of their whenua back to the first document issued on their block of land - a Crown Grant, Certificate of Title or Memorial Ownership. Along the way, whā nau discovered themselves in the pages of Whakapapa, reading narratives of their direct tūpuna talking about the old stories of battles, tribal relationships, tūpuna stories, searching Māori Land Court Minute Books, letters to the Court and much more, that help our whā nau understand the importance of Whenua, their place in the tribe, their connection to the Whenua and their responsibility in continuing the legacy left to them by their tūpuna.

From 2015 to 2019, the programme catered to over some 400 whā nau (individuals and family units) which was made up of a range of those who had no idea about their Māori Land, to those who had some knowledge of Māori Land. Whā nau groups included kaumātua/elder male, kuia/elder female, parents, children, mokopuna all learning together. At times we would have three to four generations from one family learning together, which was special. Due to Covid, in 2020 and 2021, a decision was made to set up a Trust to manage and govern the programme and to overhaul the programme into an online delivery platform. A much appreciated fund was granted from Foundation North Trust to our Trust to transition the programme into the online space. Classes were delivered online,

via zoom every Monday and Wednesday, from 7pm – 9pm, with two weekend residential study sessions – Noho Wā nanga and two online zoom weekend study sessions spread throughout the year. Course resources were updated, and turned into E-resources. A website was then created to deliver and house our resources and tū onga where whā nau could enroll and get instant access to resources that compliment their online classes.

In 2022, the Te Waka Pareparea Trust (TWPT) launched their website that would now serve as the point of contact for all whā nau coming onto into the programme (Te Waka Pareparea Trust, 2022). Our website is continually checked and evaluated for maintenance, glitches, security, and ease of use for whā nau. The website contains E-Workbook(s), E-Whakapapa Journal, Papatipu

Books, - these which hold narratives about their lands, and Whakapapa in Te Reo Māori, as recorded from our tūpuna at important tribunal meetings held by the Rangatira/Chiefs, in the early 1900s; some Māori Land Court Minute Books pertaining to the upper North Island also known as

the Te Taitokerau district; there are also research tools such as the Māori online system which help whā nau to locate their current lands, the

Te Puni Kōkiri site – Tupu for those who are in the develop-

ment phase of their land(s); the Etymology Dictionary to assist whā nau in the origin of words and Terminology; the Bouvier Law Dictionary to provide legal definition(s) and the Māori Dictionary for translations.

The TWPT website also has direct links to the Māori Land Court website, Land Information New Zealand website, the New Zealand Archives Research tool, with plans to include the New Zealand National Library and other such research institutions to bring everything into one space for whā nau convenience. We have enrolled whā nau from France, Australia, the USA and from all around New Zealand as they have aspirations to realise with regard to their whenua, and in 2023, we rolled out our Year 1 and for the first time our Year 2 programme. The programme and journey in bringing this about have been a labor of love and those who are involved like me believe the programme is valuable for Māori to reconnect to their Whenua. The legislation will continue to regulate activities permitted on Māori Land but legislation itself will not reconnect our people to their lands. The programme is like a waka/Māori canoe, where it is always being

re-purposed to fit whā nau needs, current legislative changes, amendments and current land management practices.

The programme isn't complete without the right people being involved in the delivery, and management. Key people were selected for their

“However, when we go beyond food to the whenua, the source of our wellbeing, this then draws me to conclude that it is the whenua wherein our wellbeing and health stem from; and that there is a reciprocal relationship of responsibility and obligation to treat the whenua with respect and care.”

–Joeann Walters

teaching skills, management expertise and ability to share and care for whānau coming into the programme. The Governance team consists of Hineamaru Ropati of the Ngāti Hine tribe (Chairperson of our Trust), Rose Rogers of Ngātiwai and Ngāpuhi tribes (Finance Person), Doneice Mackie of Ngātiwai, Te Akitai, Tainui tribes (Admin Co-ordinator), and Cruchanan Mclver (Secretary). The Delivery Team consists of Lorraine Cassidy of the Te Māhurehure, Ngāti Pūkahu, Te Rauwawe, Ngāpuhi Tribes (Land Navigator); Adrienne Kereopa of the Te Roroa, Te Arawa, Ngāpuhi tribes (Land Navigator). I am the owner, manager, designer, and lead deliverer of the programme.

Closing Remarks

My people continue to live on the remaining lands derived from our tūpuna to this day, despite colonization, and pressures from local government, regional and national government policies, including regulations and legislation of which our people have been forced to engage, contend with, negotiate, and to fiercely defend our lands. Add to this space the historical context whereby our tūpuna signed on our behalf (their future generations), Te Whakaputanga o Niu Tīreni 1835 and the Te Tiriti o Waitangi 1840 with a view that our lands, forests, seas, waterways and tāonga were future proofed. However, in the wake of colonization many of my people are living in poverty as a result of being alienated from their lands, language, mātauranga/knowledge, tribal tikanga/customs, including being separated from their whānau/families through numerous Acts in the 1860's, such as the Native Land Act in 1862 and the New Zealand Settlements Act in 1863 (S7). These Acts were created to allow space for European settlers by forcibly removing Māori from their traditional lands (S7). The New Zealand Settlements Act, in particular was intended to "punish so-called rebel Māori by allowing the confiscation of their lands" without any compensation (S7).

We are no longer an "infant nation", and I am no longer waiting for our Te Tiriti Partner to honor the Te Tiriti in order for things to get

better. The relationship has been often one-sided with systems and processes created for us and we are expected to "follow the process." This relationship is inequitably one-sided it's been one hundred and eighty-three years that we have been in the same bed, and we are still fighting about fair and equitable access to resources that will see Māori flourishing on their own lands as they see fit. The whole world will benefit if the Tāngata Whenua from all over the globe are living as chiefs on their own lands.

I end this paper with another whakatauki :
 "Ko au te whenua, ko te whenua ko au!"
 "I am the land; the land is me!"



Figure 1: Te Waka Pareparea Trust Online Course
 ©Te Puni Kōkiri Office



Figure 2: Reconnection Families
 ©Te Puni Kōkiri Office

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Joeann Walters at Volume 8 Conference
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Paige Puakealaha'ole Mo'okini-Oliveira

*Hawaiian
Hawaii
Pacific*

KNOWLEDGE IS FLUID

Introduction

Before beginning a new endeavor, it is important to set intentions. Setting intentions not only focuses our minds and aligns our physical body, but it can also be used to remain open to guidance along the way. My intention participating in this journal was to simply sit in the circle among Indigenous peoples; to be inspired by their powerful stories. Of course, we each arrived at the circle ready to share a message within our hearts. I am still quite embarrassed to call myself a knowledge Maker with a capital "M"—I feel that I am not that knowledgeable, not in the sense of an elder. But, in remaining open to the possibilities, I accepted this challenge only by remembering and trusting that knowledge, like water, will find its way.

I offer a celebration of knowing, and the ongoing journey of my own learning and unlearning as a young Kanaka Ōiwi (Native Hawaiian) navigating through contemporary challenges. This a reclamation of knowledge that has lived, that is not always ours to know, and knowledge departed. For the knowledge being created right now and in the days to come.

This is a love letter to all who have taught, both living and nonliving.

What is Knowledge?

Knowledge is water. We experience it using our senses. We might see it, smell it, taste it, hear it, feel it on our skin, or in the air around us. Knowledge is mist, dew clinging to earth. In front of us one moment and gone the next. Leaving us left to figure out for ourselves what it all means. Knowledge is the rain, moving across and through landscapes. It nourishes āina so we too are nourished. Sometimes, knowledge comes

like a flood. Raging with no limits; overflowing, with so much to give— if not prepared, we might not know where to put it all. Other times, we are in drought. Calling for creativity, new knowledge to be birthed. Knowledge is water. It moves through us, even though it may take some of us more training to notice its presence.

From where I stand, knowledge is fluid. It does not have a singular form, and is (re)defined over time. My lens is shaped by many people, places, and lessons. Because of this, sometimes my understanding of knowledge is contradictory on paper. For four generations now, my family and I received a Western education. Parts of that education unlocked different opportunities and privileges, but it also built walls between conflicting paradigms. Notably, on being Hawaiian.

The irony is not lost on me, that indeed, institutional education split me in two— molded one side of me while simultaneously leaving the other in a corner, showing it off whenever it was convenient. Though this was confusing, it did not break my stride. I took advantage of being exposed to our culture because it felt right. Instead of being ashamed of my privilege to learn, I thank my Western training, especially for bringing me to the sciences. One may ask, why? In a seemingly stifling yet systematic way, science taught me to question the world around me. And boy, did I question everything, including the very institution that was teaching me.

I found solace in lo'i kalo (a wetted taro pond field). I loved the feeling of the cool lepo (mud) ooze beneath my toes as we hehihehi, stomping on the

wet earth releasing oxygen and activating the good microbes. As a child, this was light-hearted, fun work, but still very important. It is something mostly everyone can do, there is no pressure—no way to fail—just stomp. Careful of the prawns and African snails! They will cut your feet, easy.

I remember how much I loved visiting Papahana Kuaola, an educational center in the back of the He'eia ahupua'a (land division), on the island of Oahu as an 'ōpio. It was a place I remember vividly of having a sense of pride in being Hawaiian. I never could forget sinking into that mud and preparing the patch to plant huli, the long stalk of the kalo. My papa grows māla kalo (dryland gardens of kalo) on Hawai'i island. So, I felt helpful and satisfied, knowing our work will help to grow food. After a half-day's work (most field trips never lasted that long), we could jump in the kahawai—its name is He'eia. Whenever I could go to a lo'i, I was delighted! It meant getting to wash off in the stream. Oh, how I loved to jump in those seductive waters. It was only during those kinds of field trips, until I reached adulthood, that I could enjoy the fresh, clean waters of an un-channelized, un-concreted waterway.

I returned to Papahana Kuaola to learn more, and serve volunteer hours, one of the requirements for the scholarship that helped support my journey in higher education. It was like returning home. My eyes, ears, lungs, heart, hands, everything was open, and they continue to be. In Hawaiian our word for land is 'āina, but it is not just "land"—'āina is that which feeds. Spiritually, emotionally, and physically. One of my mamas says it is not just land, but can also be kai (sea) and k ā naka, people. They, too, feed us; feed me. Spending time in and learning from He'eia reminded me that 'āina is greater than us (kānaka). Unko Kapalikū had one sticker on his Toyota bumper, 'ĀINA > US. I always wanted one, I wonder if he still has his.

Knowledge is learned through all six senses—sight, smell, touch, taste, sound, and feeling. In another way, knowledge exists in text and studying it until it is burned into memory. Another way of knowing is from our kūpuna (ancestors, relatives) and the kūpuna before them. I have never felt that one was more important than the other because all have been a part of my reality. Instead of outright rejecting knowledge being taught in a classroom, I began to wonder what knowledge being taught outside of one looked like. Luckily, I had already been experiencing it for myself,

but I needed help connecting the dots.

Where is Knowledge?

O ke au i kahuli wela ka honua
At the time that turned the heat of the earth
O ke au i kahuli lole ka lani
At the time when the heavens turned and changed
O ke au i ka kuka'iaka ka la
At the time when the light of the sun was subdued
E ho'omalalama i ka malama
To cause light to break forth
O ke au i Makali'i ka po
At the time of the night of Makali'i [winter]
O ka Walewale ho'okumu honua ia
Then began the slime which established the earth,
O ke kumu o ka lipo
The source of deepest darkness,
O ke kumu o ka Po i po ai
Of the depth of darkness,
O ka Lipolipo, o ka lipolipo
of the depth of darkness
O ka lipo o ka La, o ka lipo o ka Po
Of the darkness of the sun, in the depth of night,
Po wale ho'i
It is night,
So was night born.

(Wā 'Ekahi of the Kumulipo as translated by Queen Lili'uokalani in Beckwith, 1972)

To recognize knowledge is to understand where it can be found and the processes it moves through. Like water, it starts with heat and energy, as it is in many of our creation stories. The sun drives the making and remaking of wai (fresh water). Just the same, knowledge production begins with a spark; a query. One might be satisfied with wondering where knowledge could be found, yes. Skeptics from within their Western box might complain, what is the evidence of knowledge existing?

Evidence #1: Punawai – Tapping Our Reservoirs of Knowledge

"These ancestral voyagers felt at home venturing out on the bosom of their earth mother, following stars cast into their sky father by personages born of Pō. Their stories were recorded on rock, reef, mountain, stream, and the minds of their descendants. They conceived of the islands born before them as elder siblings..." (Andrade, 2013)

Punawai (pūnāwai) is the Hawaiian term for a fresh

water spring, bound together by the words puna and wai. Wai is our word for freshwater or liquid— anything without salt. Puna can be a well, pit, or cavern; a spring. Kupuna is our word for ancestor, relative, grandparent. So, a kupuna could be one who helped to physically raise us. Or, we might gain or seek knowledge through our kūpuna that have lived generations before us. Kupuna can also be a starting point, or source. What these words offer together is the imagery of the deep reverence and relationship to those before us, and the world around us— shaping our lenses. Kūpuna (plural) are so named because we honor their extensive and intuitive knowledge.

We descend from peoples whom purposefully crossed Moananuiākea, the vast, expansive Pacific Ocean. It required skill, determination, humility, and magic. The wisdom it took for our kūpuna to populate the isles of the Pacific over a period of migrations is as vast as the oceans they crossed. Without modern navigation technology, our kūpuna used the tools at their disposal— everything surrounding them. This included nā akua (gods), the elemental forces deified, resembling the reverence and respect of the natural world (McGregor, 1996). Thus, ‘ike (knowledge) lives within our ancestors and ‘āina. It was ultimately akua and ‘āina that held knowledge, but through their relationship with place, our kūpuna interpreted and created their own ways of knowing.

For many Pacific peoples, genealogy is highly respected. The Hawaiian word for genealogy is mo‘okū‘auhau (mo‘o + kū‘auhau). Kū‘auhau can stand alone to mean genealogy. Mo‘o can mean lineage or succession, so its use with kū‘auhau stresses the continuation of a family line. When we think of genealogy, we might instinctually think of our own family’s history; but it is equally important to recognize our “...profound connectedness. Through our stories, through our journies. Through our food. It is our connectedness to the light and energy within and extending into all things—past, present, and future” (Wilson-Hokowhitu, 2019).

Our connectedness to akua and ‘āina provided the necessary foundations of which to create a thriving society. A root of those foundations is found in the story of Hāloa and Hāloanakalaukapalili. Hāloanakalaukapalili was a stillborn. He was buried by his parents, Ho‘ohōkūkalani and Wākea, Sky Father. It is said that the tears of his mourning mama watered the earth. And from where Hāloanakalaukapalili was buried,

a stalk began to grow, until it matured, with a heart shaped leaf that rustled in the wind and is where his name stems from. He is the first kalo (*Colocasia esculenta*) plant. Ho‘ohōkūkalani gave birth to another son, Hāloa, the first kanaka (person). Kalo is our elder sibling with whom we have a reciprocal relationship. In order to be fed by Hāloa, we must tend not only to him, but his surrounding environments.

As Wilson-Hokowhitu (2019) reminded us, we are connected not only through our stories and journies, but through our food. Many plants brought by our ancestors on their voyages are cultivated around the globe, including Hāloa (Kagawa-Viviani 2018). Ingenuity favoured Kanaka ‘Ōiwi, who developed over 300 varieties of kalo (Kagawa-Viviani, 2018). Kanaka ‘Ōiwi indeed engineered and augmented habitat, but did so in ways that provided not depleted resource abundance (Winter et al., 2020).

“Lagona (lah-ngor-nah) is firstly a Samoan word to describe an indigenous way of knowing and learning and that it is an authentic and time-validated practice. Lagona literally means a feeling, a sixth sense, a gut feeling, some thoughts deep within that makes one think that something is up, or strange, or different, or an unexplained conviction that something is so. This could be for the good or for the not so good, depending on the direction the notion within is directing or pushing one towards. Feelings of Lagona vary in intensity and can be described as strong, medium or soft. Lagona is a way that Pasifika learn and can be considered as intuitive learning in the Pasifika world (a Pasifika worldview). Lagona includes the spiritual aspects of Pasifika learners and validates values and beliefs that influence the way Pasifika peoples take in and analyse information, people and circumstances, in order to confirm or consolidate truth. Lagona is both a verb and a noun. (Winter et al., 2020, p. 139)”

On a familial level, we tap into our ancestral knowledge reservoirs by seeking loving and supportive guidance of our kūpuna through our physical body. They communicate with us in similar ways that we experience knowledge by using all of our senses, especially our “enlightened gut,” our na‘auao (Meyer, 2001). Pukui and Elbert (1991) point out that na‘au ‘intestines, bowels, guts; mind, heart, affections; of the heart or mind; mood, temper, feelings’ are “often understood as a ‘gut feeling’ and instinct rather than an emotional feeling or affect” (Hennessey, 2022). Sauni (2014, p. 139) described a similar Samoan word, lagona.

Oliveira (2016) uses “sense abilities” to describe the various ways Kanaka ‘Ōiwi tap into our ancestral reservoirs including na‘au. Kanaka ‘Ōiwi can also rely on our longstanding ancestral relationships to place as a function of recognizing lifecycles and time (Oliveria, 2016, p. 80).

Evidence #2: Hana hou – Knowledge by Doing

“Pa‘a ka waha, hana ka lima.”

Shut the mouth; keep the hands busy

Never mind the talking; start working

‘Ōlelo No‘eau #2559

The place that raised me is on Hawai‘i island, where my Papa Peter and Puna Lei live. Papa is a retired fireman and has been ranching and farming since before I was born. Growing up, we would visit whenever we had the chance. I learned many things at Papa’s farm, especially that I liked to work with my hands and with ‘āina. When I was a little girl, Papa was always up earlier than the rest of us (even if he had too much Keystone Light the night before), getting a jump start to the day. Most of the ‘ohana also visiting from O‘ahu would “sleep in,” that is, rise after the sun had come up. As soon as we were up and at ‘em, the grandkids and cousins would go looking for Papa. Most times, we were given unglamorous tasks that made me feel a million bucks. Sometimes, Papa and some of the adults would go to his māla (garden). Upon their return, our job was to wiliwili, wash off all the dirt and huluhulu, the roots left on the kalo corm. Then, we would gently wash the kalo leaf called lau, front and back, under the cool water of the hose. When finished, we were shown how to stack the lau in Papa’s basket and how much each pile should weigh.

I patiently waited for the day to be invited, “we go pick leaf.” We packed up Papa’s green flatbed truck with the wooden side panels. My sisters and I made sure we had the baskets, scale, lau-cutting/kalo knives (never mixed with other kine), electrical tape, and rain jackets. And off we went. The drive to the māla was no more than five minutes up the road. We would turn onto a half-gravel, half-dirt road guarded by a metal fence. A little ways down the road, there was another fence we had to open that lead to a pasture of green and brown. When we arrived at the harvesting patch, Papa quietly hopped out of the driver’s seat. Pulling up his stained brown jeans, he sighed over the māla, mut-

tering, “well.” He told us once which row to start on. We learned what lau to harvest, based on size and age, and what the different colors of the leaf might mean. Papa grabbed the small knife, electrical tape already on his pointer finger and he began to cut, demonstrating how he wanted it done. Without much more to say, we got to work. We cut lau, and stacked them according to size moving along each row, mostly in silence. As is typical of this region, it began to drizzle and eventually turned into rain. I watched as the rain bounced off the kalo leaves, or pools at the piko, the center of the leaves. But we kept picking. Eventually, the rain shifted again and fizzled out, just as an earth-clinging rainbow lingered in the sky just long enough for us to all notice. “That should be good,” Papa said. Back at the truck, Papa’s intuition was confirmed by the scale, we had picked just enough for his order and for us to eat. We climbed back into the truck and headed back to the ranch where we washed up and prepared the food.

Papa’s farm is not only his livelihood, but a gathering place for family and friends. When we are there, it’s a non-stop party for a couple of days straight— with farm work in between. Some days, the rain pours so hard that the only work to be done is to feed the animals. That’s okay by us, too. There is plenty of room in the carport for all of us to stay dry and warmed by everyone’s presence. Over the years, time spent at Papa’s house shaped many of my values, including the seemingly paradoxical importance of hard work and enjoyment. My family has taught me that we learn and know by doing.

Evidence #3: Hō‘ai – Knowledge through Sharing

hō‘ai – n., to feed. (Pukui and Elbert 1991)

On my mom’s side, our great-grandmother who we call Tutu Nui was the matriarch. My great-grandfather, Papa Nui was a Merchant Marine and rigger, who spent long hours at the shipyard and on voyage. Keeping the house running, my Tutu Nui was a strict and loving mama. She was hānai (raised) by her grandmother in Waiākea and brought up in our ways. Though my memory of her is small, I have been guided by her lessons many times. She would say, “e hele mai ‘ai.” Tutu welcomed and fed all who walked through the door. Though Tutu Nui was not one for fancy things, and uti-

lized everything at her fingertips, she always had plenty to share.

Sharing knowledge is absolutely vital for its continued use and practice. Sharing knowledge allows room for knowledge fluidity, to take shape and form in ways that are context specific and appropriate. Evidence of knowledge transmission can be both oratory and written, through mo‘olelo (stories; literally succession of talk) and ‘ōlelo no‘eau (wise phrases) (Pukui and Elbert, 1991).

All Around Us

“Wāhi ka niu.”

Break open the coconut.

The breaking open of a young fresh coconut for the gods was a sign of piety in ancient times.

‘Ōlelo No‘eau #2899

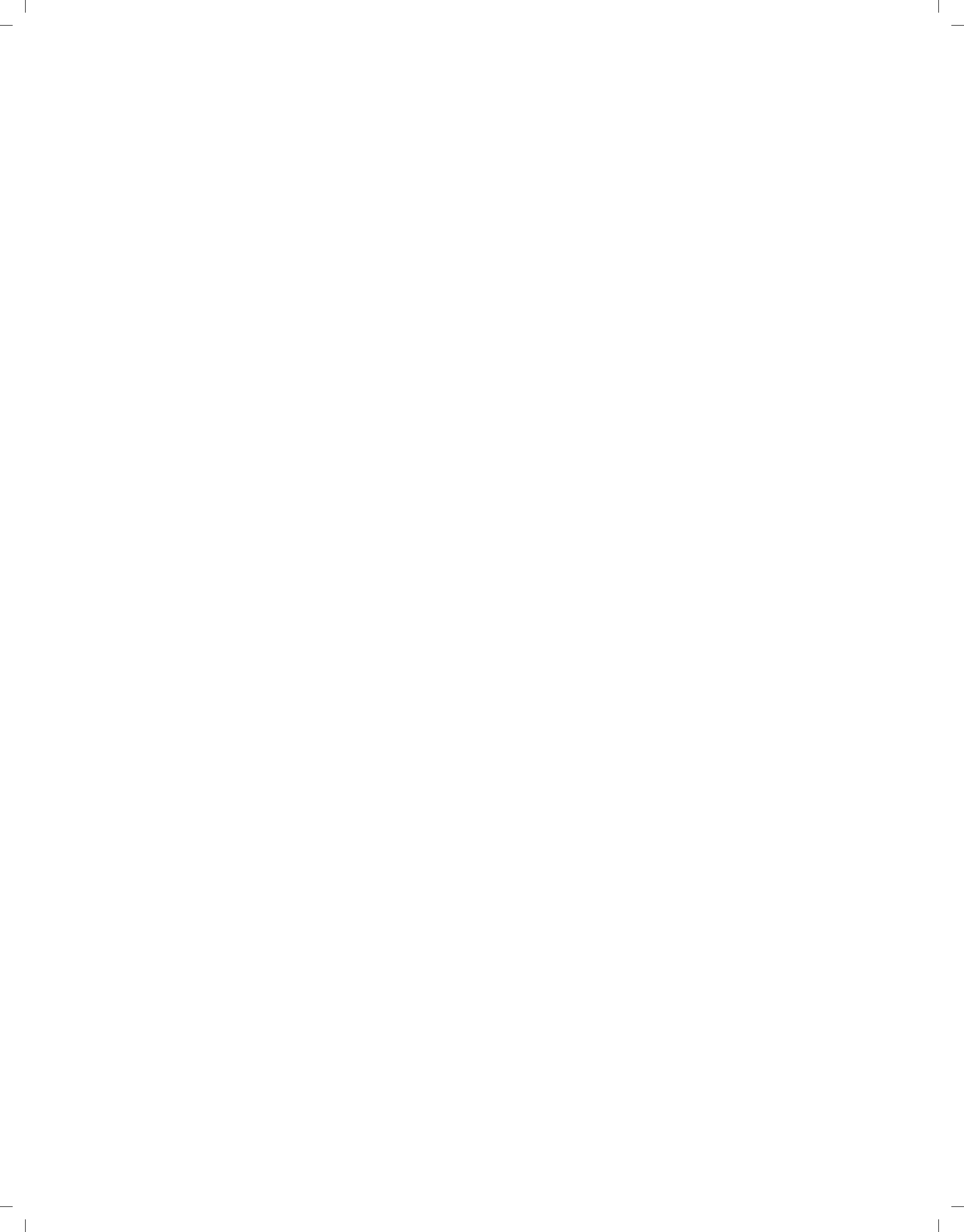
Institutional education taught me about limits and boundaries. Whereas kūpuna, teachers, and mentors show me everyday that our abilities to know are unbounded. Limitless. Ways of knowing do not stop on a page or screen. Ways of knowing comes from experience and (re)searching. Our ways of knowing are as vital as water itself. For health, growing food, and cleansing. Without water, we lose ourselves and our abilities to continue practices important for our collective well-being.

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