



Religions *for* Peace

Indigenous Peoples' Food Systems:

*Using Traditional Knowledge to Transform
Unsustainable Practices*

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 Religions *for* Peace



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Foreword

On 2-3 June 2022, Stockholm+50 celebrated an important milestone for humanity's relationship to the Earth: the 50th anniversary of the 1972 Conference on the Human Environment. This landmark meeting launched decades of work—and many successes—to address our planetary crisis. However, Stockholm+50 also recognised new concerns that must be urgently addressed.

H.E. Ms. Inger Andersen, Executive Director, United Nations Environment Programme (UNEP) was the Secretary-General of this International Meeting. Ms. Andersen, the meeting's co-hosts (Sweden and Kenya), and the Stockholm+50 Secretariat were advised by the Stockholm+50 Advisory Group. The advisory group included ten eminent people from different geographic and sectoral backgrounds who provided guidance on matters such as visioning, leadership dialogues, and stakeholder engagement.

Prof. Dr. Azza Karam, Secretary General of *Religions for Peace*, served as a member of the UNEP Advisory Group, where she filled a critical gap in multi-religious outreach and advocacy by including the perspectives and expertise of faith leaders from Indigenous communities; religious institutions; faith-based organisations; and grassroots interfaith youth and women's organisations. In addition to drawing attention to their contributions to environmental policy and ecological justice, she also ensured that a special focus was placed on the contributions of Indigenous communities.

This paper is one of a five-part series that focuses on how Indigenous Peoples' knowledge can help us all move toward a more sustainable way of life. The series reflects the thoughtful conversations and various perspectives that were shared during and post Stockholm+50 on topics such as protecting the rights of Indigenous Peoples, local communities, and environmental defenders; amplifying the voice of women, girls, and youth in climate solutions; and protecting those who are most vulnerable to—and most impacted by—climate change.

Key Elements of Resilient Indigenous Peoples' Food Systems That Can Guide the Transformation of Unsustainable Food Systems

INTRODUCTION

We live in a time of crisis caused by conflict, climate shocks, and the threat of a global recession.


Every night, around 828 million people go to bed hungry (FAO et al., 2022). For some years, there was some progress in tackling food insecurity. However, after the COVID-19 pandemic, the number of people unable to access a healthy diet rose nearly 30 times. That means that 3.1 billion people—40% of the world's population—do not have access to a healthy diet every day. The expectations for the future are not optimistic, given the current crisis linked to conflict and climate change. Although for some years, food security was addressed based on productivity and yields, we now also need to produce food sustainably and think about building resilient communities.

Intensive agriculture, the current model used to address food security, focuses on productivity. This model was rooted in the Green Revolution that emerged in the 1960s, when high-yielding varieties, monocropping, and intensive chemicals were highly promoted to maximise the yields of specific crops per unit of input (Pingali, 2012).

However, this model led to unsustainable food systems. Intensive agriculture accounts for 30% of the greenhouse gases contributing to climate change (Fanzo and Downs 2021), uses 70% of the freshwater, and is responsible for 80% of the world's deforestation (FAO, 2017).

Additionally, this model has made us dependent on a few crops, such as wheat, maize and rice, which provide at least 50% of the world's caloric intake (Awika, 2011 and Chivenge et al., 2015), with 25 other crops to make up 90% of it.





Relying on a few crops when food chains are disrupted, as we experienced with COVID-19 or the current conflict between Russia and Ukraine (World Bank, 2022), threatens the world's food security (Triphanti, 2016) as food supplies are reduced. Some studies also suggest that promoting this model and monocropping has caused the loss of biodiversity (Jacques et al., 2012).

Are there alternatives we can use to ensure sustainable food systems? Indigenous Peoples create some of the world's most resilient, sustainable and nutritious food systems. We can learn from their game-changing solutions.

WHAT CAN INDIGENOUS PEOPLES' FOOD SYSTEM OFFER THE WORLD?

Indigenous Peoples represent only 6% of the world's population, but they are custodians of 80% of the world's biodiversity in less than 28% of the world's lands (Sovrevilla, 2008).

The 476 million Indigenous Peoples that inhabit more than 90 countries across the seven socio-cultural regions are crucial for the world's resilience and sustainability because their deep knowledge and practices have allowed them to inhabit a broad range of environments, even those that many people call hostile, such as the cold lands of the Arctic or arid lands of the sub-Saharan desert.

Indigenous Peoples are deeply knowledgeable about their territories and their seasonal cycles; they know what to eat according to the time of year, what to use for dress or cover, and what plants to use for medicine, shelter or energy. In addition, they speak 4,000 of the 6,000 remaining languages in the world (UNDP, 2018), and some researchers agree that the areas with higher linguistic diversity are also the most biodiverse (Gorenflo et al., 2012).

A basic difference between Indigenous Peoples' food systems and conventional agriculture is that the first focuses on meeting the needs of their family and part of the community, rather than production for profit. This means that Indigenous Peoples must be deeply familiar with seasonal cycles in order to know what to harvest, fish, and hunt, according to the time of year.

For example, during the rainy season in the Èyuujk region of Oaxaca, Mexico, Èyuujk people know what mushrooms to harvest when there is no maize yet in their field. Also, at the end of the year, they know what sort of birds they will be able to find and eat. This also explains how Selkup people in Siberia know how to preserve meat for the cold winter and have a rich nutritious diet despite the cold weather (Personal Interview 1, 2021).

When compared to conventional intensive food systems, Indigenous Peoples' food systems can contain up to 250 different foods in a single food system, according to FAO (2022). However, the question remains: given how rich the Indigenous Peoples' Food Systems are, why have they been undermined by science and policymaking?

INDIGENOUS PEOPLES' WAYS OF CONSTRUCTING KNOWLEDGE

Mainstream science and policymakers have failed to understand the complexity and richness of Indigenous Peoples' knowledge and food systems, which is why they have not been actively embraced.

Indigenous Peoples' ways of constructing knowledge rest on three main components: observation, practice, and values. This could explain the perception of mainstream researchers and policymakers that Indigenous knowledge (IK) is created by "trial and error." To Indigenous Peoples the process is much more complex, it is "trials and accumulation of experiences," which rests on what is known in science as induction.

Although "trial and error" is widely accepted, it does not reflect an in-depth understanding of the process that explains the sustainability of Indigenous Peoples' food systems and their high resilience as described in the scientific literature (e.g., Gliessman, 2015).

In those sustainable/resilient systems, it is still possible to witness ecological concepts at work, such as allelopathy to control weeds and soil microbial population through stress factors due to secondary metabolites from arvenses growing in the system (Chacon & Gliessman, 1982; Rosado-May, 1991), as well as multitrophic interactions in insects populations (Letourneau & Altieri, 1999; Shennan, 2008), or evidence that polycultures are more productive per unit of area than monocrops, called Land Equivalent Ratio (Vandermeer & Schults, 1990) or higher Potential Nutrient Adequacy, e.g., more nutritious diets from a polycropping as in Indigenous Peoples' food systems than the conventional monocropping (Lopez-Ridaura et al., 2021). Each year Indigenous farmers design and manage their systems based on years of accumulated experience; it is known as hysteresis (Vandermeer & Perfecto, 2019) and explains their successful process for achieving and maintaining the resilience of their food systems.

Food Security: Productivity vs. Polycropping

In a project aiming to increase food security in Mexico in 2012, a researcher on a field visit to an Indigenous community in Chiapas made a suggestion: if food security was about increasing yields in the project, these Indigenous Peoples should switch to monocropping and use improved technologies, such as using high-yielding varieties of maize instead of native seeds and using chemical inputs to improve the maize yield instead of cultivating maize along with other crops. The researcher's rationale was that food security could be achieved by simply increasing maize yields.

The local Indigenous community explained to the researcher:

- We do not only eat maize. We need the different crops that we have in our 'milpas' (an intercropping native maize system with beans, potatoes, squash, tree fruits, and other plants), because we rely on these crops for our diets throughout the year.
- In support of this argument, Lopez Ridaura (2021) found that farmers in Guatemala

prefer milpa systems over maize monocropping because milpa provides them with a more diverse and nutritious diet. According to Lopez-Ridaura, the Potential Nutritional Adequacy (PNA) index, used to evaluate the recommended nutritional intake for a person per day, is higher for a milpa system vs. monocropping, which supports the argument of the Indigenous Peoples.

In the end, the researcher understood that there is a complex rationale for how Indigenous Peoples choose to keep their systems; it offers sovereignty and resilience.



A Mayan milpa field (Source: Matias Holi, 2022)
(For more information, see Martinez-Cruz, T.E. 2020a)

Assuming that IK is only the result of anecdotes, experience, or traditions relegates IK to the lowest rung in the conventional hierarchy of scientific evidence (Milbank et al., 2021). This would mean that Indigenous knowledge lacks analysis and synthesis, two critical components in science that lead to theories. It would also mean that IK may not be considered an important element in the discussion on transforming unsustainable food systems.

Indigenous Peoples' way of creating knowledge offers a means of constructing powerful ideas that guide their thinking and actions when it comes to the design and management of their food systems. For instance, the Yucatec maya developed the concept of *iknal* and *tsikbal* (Rosado-May et al, 2020). *Iknal* is the space in which the model presented by Rogoff (2014), known as *Learning by Observing and Pitching In*, operates in the process of learning and constructing knowledge in Indigenous communities; *tsikbal* is the equivalent of effective communication based on participatory action, not just using words.

Based on extensive participatory action research, we have identified the following powerful guiding idea that inspires changes and innovation in the design and management of what we now know as sustainable/resilient Indigenous food systems:

*When I think about my farming for next year, I want to make sure **(food security)** that I can produce enough food **(food sufficiency)** without having to depend on external help **(food sovereignty)** and without harming the environment **(resilience/sustainability)**. I do not have only my milpa; I also have my home garden, bees, my animals, I work in the forest... So, in the long term, I need to have my farming in such a way that I can let the system take care of itself so that I can do other things for my family; I know it will not be perfect **(dynamic equilibrium)** but it is part of the many things I do (FJRM 2022).*

The above expression is, in fact, the result of analysis and synthesis. It can guide public policymakers to develop a strategy in which two ways of constructing knowledge, Indigenous and scientific, can collaborate and learn together about the design and management of sustainable food systems. It also reflects the richness of Indigenous Peoples' Food Systems and addresses food security, food sufficiency, food sovereignty, resilience and sustainability, which has allowed Indigenous Peoples to co-exist over the years and become champions of resilience and guardians of the world's remaining biodiversity.

THE ROLE OF VALUES

Observation and practice are critical components to learn about sustainable/resilient Indigenous Peoples' food systems. However, they both need direction, which is provided by the values that drive the actions. A key feature of Indigenous Peoples is that they maintain their core cultural values. Values are the glue that makes it possible for observation and practice to both design and manage sustainable/resilient food systems and ensures that the communities can survive as a result of collective action.

In addressing the issue of values in Indigenous Peoples, Harris & Wasilewski (2004) identified the four R's that represent the core values for Native Americans: Relationships, Responsibility, Reciprocity and Redistribution. Contrasted with these values are power and profit, which describe conventional food systems. The Yucatec Maya, on the other hand, have four C's: Cooperation/Collaboration, Coexistence, Coordination and Care, which forbid stealing, competing, and co-optation (FJRM, 2022). However, in essence, the core values of both, Native Americans and Yucatec Maya are quite similar.

For Indigenous Peoples, values guide the development of a society's social fabric, governance, and conflict resolution, which in turn set conditions for peace. It is under peace that natural resources and food systems are designed and managed sustainably and develop high resilience, innovating and adapting to changes, including climate changes.

Collective Action and Values around Food Systems

During COVID-19, an Èyuujk community in the highlands of Oaxaca, Mexico, used their right to self-determination and self-governance to call for a collective lockdown in the face of the lack of vaccines and unknown risks posed by the virus. One of the first lockdown actions was to forbid the entry of external people into the community; only Èyuujk people and people living in the community were allowed to go to the Sunday markets. Although there was uncertainty how this would affect the community, Indigenous farmers and local traders managed to supply the community's food needs. In fact, some locals said, "We do not miss the external traders; they only sell junk food, and our people sell healthy food."

When markets fluctuated, the prices of basic foods in the cities increased, and the local authorities sanctioned or ensured that no trader or person would abuse the pandemic to take advantage of others, e.g., increasing the prices of eggs that went up at the end of May 2020.

Collective action and looking after each other was a key element in the community's COVID response. It not only helped many Indigenous Peoples to overcome the effects of the pandemics, but it also gave them the agency to take the initiative and what was best for their community.

(For more information, see Martinez-Cruz, T.E. 2020b).

The sustainability and resilience of Indigenous Food Systems do not depend only on ecological factors. Values, a sociocultural component of Indigenous communities, play a critical role in the sustainability of food systems. Any public policy that aims at transforming unsustainable food systems into sustainable ones must consider a transition period in which core cultural values can be reinserted into the social fabric of Indigenous communities.

Values are an invisible factor behind the decisions and actions regarding the understanding and management of natural resources, including food systems.

Values explain why Indigenous Peoples protect about 80% of the planet's biodiversity, even though they only represent about 6% of the world's population and only live on about 28% of Earth's land mass. However, both Indigenous Peoples and the biodiversity they protect are in danger (Nitah 2021; Raygorodetsky 2018; Scientific American 2021; Veit & Reytar 2017).



THE CIRCULARITY OF THE NUTRIENTS AND ELEMENTS WITHIN INDIGENOUS PEOPLES' FOOD SYSTEMS

While most of the world conventionally wastes 30% of the food along the value chain (FAO, 2022), Indigenous Peoples have an approach that helps them reduce food waste and reinforce circularity in their food systems. For example, Indigenous Peoples' deep knowledge of their territories allows them to use resources efficiently, while their values allow them to be more resilient and respect seasonality and natural cycles instead of production when gathering crops.

Food loss is reduced by Indigenous Peoples because of the idea of circularity but also because food chains are shorter. In the end, it is a combination of values and practices Indigenous Peoples' have adopted and adapted that allows them to circulate the elements of the system more sustainably.

A Feast for a Week

“Making rituals in my hometown is the best example of food reuse. To start with, most of the elements used for the rituals are produced locally as they have a meaning in the offer, e.g., locally raised chickens, native maize and beans for the food, wild varieties of herbs that will give a special taste to the food we make.

On day one, we generally eat some boiled native black beans and handmade tortillas as we prepare things for the ritual; we will use maize and beans in the ritual and for the feast after the ritual, so they must be cooked in advance. On day two, when we perform the ritual because we use many eggs as part of it, we generally eat eggs soup with herbs; we only use a tiny part of the eggs in the offer, so we keep the rest for later in the day. On day three, we are finally making the real food for the guests and anyone that want to join us; we generally make chicken soup and some ‘tamales’ (maize rolls with beans covered by special herbs to flavor them, and we use maize leaves to wrap them and then boil them). On day four, we make another chicken soup called Amarillo with the leftovers of day two and cook some tamales and some sort of empanadas wrapped with maize leaves and cooked with water vapor. On day six, we make empanadas with the leftovers, and this is now more like a normal empanada cooked on a clay plate. On day seven, we would typically eat the leftovers of the previous days. If there are any leftovers, they are used to feed our chickens or dogs. Nothing can be wasted; I do not recall so much food waste in the whole process and instead yummy food, one meal turning into another with more herbs and flavor.”

(TEMC, 2022)



Tamales on the Day of the Feast (Source, Eliel Cruz, 2022)




Empanadas on Day 6 (Source, Collective Tunmuk Käjpxmuk, 2022).

Food for Us—and Others

In the Mayan Peninsula of Yucatan, Matias Holi, a young Mayan Indigenous farmer, indicates that they have a close relationship with bees, so they must ensure that they are doing well too. Because of the climatic variation observed in the region, he puts the beehives near his milpa system so that in case the rains affect the flowering of other trees; the bees could survive by taking from the milpa fields what they need. If the bees are okay, and the honey harvest goes well, he will get an extra income to invest in the milpa or get anything additional he needs. Thus, in the system, Indigenous Peoples care not only about humans but also animals and other living beings or elements of the system (2022).



Matias holding the beehives (Source, Matias Holi, 2022).



Territories are so crucial for Indigenous Peoples that removing them from their ancestral lands will threaten their survival and their crucial role as guardians of the world's biodiversity. Additionally, some studies support the idea that the displacement of Indigenous Peoples and their diets can be detrimental to their health. See Kuhnlein (2018), a survey of how the displacement of Indigenous Peoples' diets can result in health issues such as lower levels of vitamin D.

Thus, ensuring the rights of the Indigenous Peoples to their territories is a matter of food security for them and for the world's resilience and food security. Figures suggest that 25% of Indigenous Peoples' lands are under constant pressure from extractive industries to extract resources or agricultural activities (Kennedy et al., 2022). There are also other silent ways in which their systems and lives are threatened, such as insensitive policies that erode their knowledge, food and education systems.

THE WAY FORWARD

This question is often asked in relation to Indigenous Peoples' food systems: can Indigenous Peoples and their food systems feed the world? According to a study run by Kurashima et al. (2019), before 1777 (the arrival of the first European settlers), Hawaii only cropped 6% of the land and was able to produce close to one metric ton of food, which could feed 86% of its population today. Today, the agricultural area has increased three times and produces six times less than the food produced before 1777.

The study concludes that Indigenous Peoples' practices in Hawaii were sustainable and capable of feeding the local population through different climatic scenarios.

Thus, if we want to transform our current food systems into more sustainable ones, it is time to truly embrace Indigenous Peoples' knowledge and practices and scale up their game-changing food systems to feed the world sustainably. But in doing so, we make some recommendations.

First, we need public policies that aim at preserving and improving Indigenous food systems by understanding all the components that explain their resilience. This means that instead of pushing top-down policies on food, nutrition, education, water, or health, we must first understand what they do and why they do what they do.

Secondly, the first recommendation can be used to build bridges between cultures and work together to transform unsustainable food systems. Indigenous and non-Indigenous cultures alike face global challenges (climate change, soil erosion, loss of biodiversity, hunger, changing immigration patterns for both humans and animals, soil and water pollution, and new human and animal diseases). Combining the best of each culture gives hope for overcoming those global challenges.

Finally, we should also have a right-centred approach that puts Indigenous Peoples at the centre. Indigenous Peoples and their values shape nature and nature shapes them. Nature is at the centre of their

cosmovision, and their practices and values ensure that the system continues its sustainability and resilience. Thus, if the world wants to have a sustainable planet and sustainable and resilient food system, we must learn from Indigenous Peoples, guarantee their rights to their ancestral lands, and protect their culture, languages, and knowledge.

If we are serious about making our current food systems more sustainable, let us consider Indigenous Peoples' food systems as a game changer not just to increase productivity but to be a critical component in policy and science processes. In that way, Indigenous Peoples can continue being the guardians of the world's biodiversity and contribute significantly to make our planet sustainable and resilient.



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