



CENTER FOR
BEHAVIOR & THE
ENVIRONMENT



Reviving Ancestral Farming Practices through Behavioral Science

How the Center for Behavior & the Environment at Rare equipped local changemakers in Chiapas, Mexico



Executive Summary

The decline of indigenous agricultural systems has negatively affected Mexico's biodiversity, climate resilience, nutrition, and public health. With the rise of commercial seeds, nitrogen fertilizers, and synthetic pesticides, many communities have abandoned ancestral farming methods such as milpa, which is an inter-cropping system that enriches the soil, protects natural ecosystems, and produces high-nutrient foods. In 2018, with support from Rare's Center for Behavior & the Environment (BE.Center), Centro de Investigación y Servicios Profesionales A.C. (CISERP), a non-profit organization in the state of Chiapas, developed a campaign rooted in behavioral science to promote the re-introduction of traditional milpa practices in the town

of Tojtíc. Through hands-on trainings in agroecology, community fairs, and widespread social engagement, CISERP's campaign leveraged the BE.Center's behavior change strategies to promote new norms and generate a collective sense of pride in the ancestral milpa practices. After a year of the campaign, sustainable milpa planting practices and consumption of milpa products increased significantly, leading to improved ecological, social, and nutritional outcomes for the Tojtíc community. These outcomes support broader efforts to revive indigenous farming practices as a solution for food security, public health, and climate resilience in Mexico and across the broader environmental field.

Background

Traditional agricultural systems and indigenous knowledge have been critical pillars of biodiversity, food security, and nutrition for centuries. In Mexico, one of the most biodiverse countries in the world, indigenous communities hold rich ancestral knowledge and agricultural practices originating from the Aztecs, Olmecs, and Mayans.

One traditional agricultural method practiced across Mesoamerica, milpa, is considered among Mexico's greatest biological and cultural contributions to the world.

Milpa is an intercropping farming system consisting mainly of beans, maize, and squash, also known as "Las Tres Hermanas" or "The Three Sisters." These three crops form symbiotic relationships with one other and with other species, such as fruit trees and wild herbs. This kind of diverse ecosystem where many species are planted together is called a polyculture, and provides great benefits to both people and the environment. Polyculture systems like milpa enrich the soil, produce higher yields, and are more resistant to pests, which means there is no need for synthetic fertilizers or pesticides. Additionally, milpa provides farmers with nutritious foods for their families and communities, and reduces their vulnerability to food and financial insecurity in cases where one crop fails.

Traditionally, Mayans would preserve their native seeds to maintain the milpa system. In this way, hundreds of variations of maize, squash, beans, and other crops could be preserved through generations. These ancestral practices are now recognized as key elements of agroecology, or sustainable agriculture.



The problem

With the recent rise of commercial seeds and chemical fertilizers, many indigenous farming communities in Mexico have abandoned their ancestral farming methods for new technologies promising higher yields at lower costs. Multinational corporations and some government programs have targeted and encouraged farmers to adopt industrialized methods, guaranteeing higher profits with their use. They often do this by giving out free fertilizer and commercial crop seeds. Over the years, many milpa farmers have started planting these commercial crops with fertilizers instead of their local seeds.

Unlike native seeds, commercial seeds are bio-engineered and are designed to grow large amounts of a single crop, called monocultures, which significantly reduce the biodiversity of the land. Commercial seeds require large amounts of nitrogen fertilizer and pesticides, which contribute to greenhouse gases and climate change. While this industrialized agricultural method may increase yields temporarily, these practices are incredibly destructive to the soil, reducing the quality and quantity of food that the earth is able to produce long-term. Along with the use of commercial seeds, fertilizers, and pesticides, other harmful land practices have also become widespread, like slashing and burning crops to clear the land for large monocultures. Together, these unsustainable practices significantly threaten the communities' access to natural resources and food security, which the traditional milpa system was designed to protect.

Beyond the environmental implications, the decline of the milpa system, and thus the milpa diet, is tied to malnutrition and obesity, both of which are significant public health challenges for Mexico. Studies show that since the 1980's, traditional, healthy ingredients, such as those provided by the milpa diet, have largely been replaced by calorically dense foods and sugary drinks.¹ Mexico is now the largest consumer of ultra-processed foods in Latin America.² Along with this shift to commercialized foods, there has been a growing perception that milpa is the food of the poor, or of the "campesinos," casting a negative social image on the traditional dishes using maize, beans, squash, chili, and wild herbs.³ This decline of the milpa diet is one of many complex factors contributing to why Mexico's obesity rates are among the highest in the world, with obesity now affecting 30% of the adult population.⁴ Additionally, one third of Mexico's children and adolescents are overweight or obese, prompting the government to declare an epidemiological alert on obesity in 2016.⁵

However, experts state that reviving the milpa diet could be a solution for improving food security and obesity for all of Mexico, since the milpa diet involves low consumption of animal products and a diversity of nutritious food, all while using less land and agricultural inputs.⁶ The nutritional and public health benefits of the milpa diet, coupled with its ecological benefits, illustrate how important it is to protect and revitalize the ancestral agricultural practices in Mexico.

A story of change

In the Tojtíc community of Chiapas, Mexico, the milpa system has long been a part of the cultural heritage. The people of Tojtíc belong to the indigenous Mayan group, Tsotsil, and for centuries they have cultivated their own strands of maize, squash, beans, and other native crops. However, like many communities in the Mesoamerican region, Tojtíc was hit with a wave of pressure campaigns and marketing in the early 2000's seeking to industrialize agriculture for the sake of more rapid food production and economic growth.

While most farmers in Tojtíc continued to value their native milpa seeds, they began using the commercial seeds and chemical fertilizers for their main plots and moved their native seeds over to smaller gardens. After adopting the industrialized methods as their primary form of farming, the sustainable practices of intercropping and natural nutrient management were increasingly lost or devalued.

In response, the non-profit organization, Centro de Investigación y Servicios Profesionales A.C. (CISERP), began working with the Tsotsil farmers in Tojtíc to

revitalize their traditional milpa systems and promote agroecological practices. **With strategies and tools developed by Rare's Center for Behavior & the Environment (BE.Center), CISERP was able to enhance its work and deliver promising results.**

The BE.Center's involvement

In 2017, the BE.Center launched the Farming for Biodiversity project, which combined a global [Solution Search contest](#) with a series of behavior change trainings to identify and replicate promising approaches for biodiversity-friendly agriculture. After attending one of these trainings, called [Campaigning for Conservation](#), in Spring 2018, CISERP launched a year-long social marketing campaign to address the social and environmental challenges facing Tojtíc and to particularly focus on milpa practices. This solution first came from CISERP's close ally, [Desarrollo Alternativo e Investigación \(DAI\)](#), who was a winner in the contest.

The Campaigning for Conservation training equips conservation practitioners with a global theory of behavior change, social marketing tactics, quantitative and qualitative research techniques, and effective campaign design in order to achieve social and ecological impacts. In this way, the behavior change solution that emerges is designed alongside community members to meet the farmers' needs while understanding their unique barriers and motivations.

In the first phase of the program, the BE.Center team helped CISERP analyze the systemic forces at play in Tojtíc in order to determine which behavioral changes could have the biggest impact on biodiversity, food security, and



ecosystem health. Narrowing in on the target audience and target behaviors of the intervention, as well as the desired conservation results, was a critical first step to building a breakthrough behavior change solution.

CISERP's target audience was the 324 milpa farmers in Tojtíc, and its campaign centered on promoting the following target behaviors:

Motivate Tojtíc farmers to...

1. Compost their organic waste (rather than burn it, which is common practice).
2. Reduce their use of chemical fertilizers.
3. Share and exchange native milpa seeds with other farmers.
4. Commit to a five-year program throughout which these efforts will be sustained.

The BE.Center's training program taught CISERP to design a cohesive social marketing campaign rooted in a deep understanding of the target audience. In collaboration with Tojtíc community members, CISERP developed effective materials and activities to promote the target behaviors. The materials included a slogan, a comic book, a puppet show, and a mural, all in the native Tsotsil language and all conveying that ancestral milpa practices are something to be proud of and to protect. CISERP designed these campaign materials to be digestible and accessible, weaving the campaign message into the pop-culture of the community. The puppet shows and comics were especially intriguing for the children, who could then carry the message of pride home to their parents. Engaging the children is also a



way of helping them develop an early appreciation for local and sustainable agriculture, which is largely missing as many young people in the region have migrated to cities, further intensifying urbanization.

CISERP hosted hands-on capacity-building trainings, called Field Schools, where farmers could gather to learn about sustainable practices like composting, intercropping, and nutrient management. To promote the conservation of local seeds and use of the milpa crops, CISERP organized a seed fair for farmers to exchange their native seeds. Simultaneously, it also hosted a nutritional fair in which the women in the community could opt-in to prepare dishes using ingredients from the milpa and share recipes with each other. Coupled with the social marketing materials, these fairs offered the community a space to celebrate their native milpa crops, participate in peer-learning, and preserve the agroecological practices unique to their culture.

The BE.Center's methodology and [levers of behavior change](#) informed the design of each of these campaign materials and activities. These levers offer environmental leaders a more complete toolkit for environmental action. For example, facilitating community exchanges for observing the desired behavior (such as the Field Schools), or harnessing the community's sense of pride in their native crops are both proven strategies from the [BE.Center's toolkit](#) that meet people where they are to create enduring pro-environmental behavior change.

Throughout the year-long campaign, the BE.Center staff provided ongoing mentorship and support to CISERP.



Results

A year after launching their campaign, CISERP achieved promising results in the Tojtíc community. Some key outputs and outcomes include:

90%
of the 324 milpa farmers in Tojtíc adopted the agroecological practices promoted by the campaign.

This represents a 73% increase in farmers adopting sustainable practices including composting organic waste, intercropping, and reducing the use of chemical fertilizers, which improve soil health.

95%
decrease in the use of Glyphosate.

Glyphosate is a dangerous herbicide commonly used in Chiapas that threatens human and ecosystem health, especially aquatic and marine organisms through contaminated water.

485
Pounds of nutritious edible mushrooms harvested.

Using the newly generated compost, CISERP trained a group of 16 farmers in Tojtíc in how to harvest nutritious edible mushrooms for both self-consumption and sales. 36 families in the community took part in this effort across four mushroom harvesting sites, each producing an average of 220 kg (485 lb) of mushrooms over the course of eight months, of which 60% were distributed to the community for household consumption and 40% for sales.

65%
of milpa farmers committed to participating in a five-year seed conservation program.

This program ensures these renewed practices will not fade from one season to another.



65%
of milpa farmers increased their production and consumption of milpa crops.

Planting and consuming more maize, beans, squash, and other crops associated with milpa increased the biodiversity of the farmers' plots and the nutritional value of their diets.

259
of the 324 farmers began using, sharing, and exchanging native seeds.

This represented a 45 percentage point increase, meaning that 80% of the targeted farmers were now participating in traditional seed conservation practices and increasing the biodiversity of their farms.

100%
of farmers transitioned to composting organic waste.

Burning residual milpa waste stopped, which supports climate change mitigation and adaptation by putting carbon back into the ground and restoring the soil.

200
daily calorie reduction from decreased intake of ultra-processed foods.

As a result of increased consumption of milpa products, CISERP observed nutritional improvements. The average consumption of calories per day shifted from about 1900 to 1700. This decrease in daily consumption of calories can be attributed to a reduction in consumption of ultra-processed foods. For example, Pozol, which is a traditional refreshing drink made from fermented native corn, grew in popularity as a replacement to sugary drinks and sodas.

Protecting a legacy

Throughout its partnership with CISERP, Rare's Center for Behavior & the Environment applied its innovative methodology and proven capacity-building to design, deliver, and ultimately help sow the lasting impact led by the Tojtíc community in Chiapas. Moreover, CISERP utilized the campaign materials, such as the comic and puppet show, to reach other Tsotsil communities outside of Tojtíc and to spread the important message of conserving the milpa. The decline of ancestral milpa practices is largely a behavioral problem and required the kind of behavioral solution that the BE.Center, CISERP, and these communities all helped create. As Campaign Manager Noe Martinez Rojas mentions, reviving ancestral farming practices is more than a point of pride; it is a vital and ongoing mission and Rare's BE.Center has better equipped them to meet this challenge. Through the BE.Center's behavior change training, CISERP adopted a more effective behavioral approach, in tandem with a crucial environmental goal, enabling people and nature to thrive more fully even years later.



Rare's C4C training gave us the tools that we needed to improve our work in Tojtíc. Protecting our milpa and our legacy of native seeds is a battle against the big transnational companies. More than anything, we have learned that people can adopt new behaviors and maintain them. It's possible for people to say, 'This is my milpa, and I'm proud of it.'

– Noe Martinez Rojas

Campaign Manager, CISERP

This campaign is part of the Farming for Biodiversity project funded by the International Climate Initiative (IKI), a German initiative supported by The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) on the basis of a decision adopted by the German Bundestag.

1 Marrón-Ponce, J. A., Tolentino-Mayo, L., Hernández-F, M., & Batis, C. (2018). Trends in Ultra-Processed Food Purchases from 1984 to 2016 in Mexican-Households. *Nutrients*, 11(1), 45. <https://doi.org/10.3390/nu11010045>

2 Ibid.

3 Ibarrola-Rivas, M. J., & Galicia, L. (2017). Rethinking Food Security in Mexico: Discussing the Need for Sustainable Transversal Policies Linking Food Production and Food Consumption. *Investigaciones Geográficas*, (94). doi:10.14350/ig.57538.

4 DiBonaventura, M. D., Meincke, H., Le Lay, A., Fournier, J., Bakker, E., & Ehrenreich, A. (2017). Obesity in Mexico: prevalence, comorbidities, associations with patient outcomes, and treatment experiences. *Diabetes, metabolic syndrome and obesity: targets and therapy*, 11, 1–10. <https://doi.org/10.2147/DMSO.S129247>

5 UNICEF Mexico (2020). What are we waiting for? Child obesity in Mexico presents an urgency that demands immediate change. Retrieved from <https://www.unicef.org/stories/what-are-we-waiting-for-obesity-mexico>

6 Ibarrola-Rivas, M. J., & Galicia, L. (2017). Rethinking Food Security in Mexico: Discussing the Need for Sustainable Transversal Policies Linking Food Production and Food Consumption. *Investigaciones Geográficas*, (94). doi:10.14350/ig.57538.