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Indigenous Science

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Experts in New Orleans believe that erosion was a major reason behind the failure of levees in Hurrican Katrina. One of the approaches being used to prevent future failures is not the high-tech solution that might be expected. Instead, it is a simple, inexpensive technique used for centuries by indigenous farmers in South India: planting vetiver grass. Historically planted to mark borders and help maintain moisture and nutrients in soil, this ancient technology has been used successfully over the past decade to clean up toxic waste and prevent erosion in dozens of countries. This is just one of thousands of examples—medical, social, and ecological—of indigenous science solving contemporary problems.

Indigenous solutions like these are being brought forward through a system called permaculture. The concept of permaculture was developed in the 1970s by Australians Bill Mollison and David Holmgren, whose work focused on perennial farming practices that make use of nature's patterns and relationships. As the name suggests, permaculture aims to create permanent agriculture as well as permanent human culture by cultivating a regenerative relationship between people and the earth, using both old and new techniques. More a way of approaching problems than a fixed set of steps, its principles can be used to restore degraded landscapes, create self-sustaining food production cycles, and even significantly combat global warming through soil building and no-plow farming methods.

From its roots as an agro-ecological design theory, permaculture has grown a large following that continues to expand on the original ideas through a network of trainings, publications, permaculture gardens, and Internet forums. With projects in at least 75 countries around the world, it has become both a design system and a lifestyle ethic. And indigenous traditions play a central role in its success.

A Way of Cultural Resistance

Pine Ridge, an Oglala Lakota(Sioux) reservation in South Dakota, has long been associated with native resistance, holding a unique place in the history of indigenous struggle. Today Pine Ridge is notorious for being the most impoverished reservation in the United States, with an adolescent suicide rate four times the national average, unemployment around 80 percent, and many residents without access to energy or clean water. Although there is a good deal of agricultural production on the reservation, according to the USDA only a small

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percentage of tribal members benefit directly from it.

Guillermo Vasquez, a Nahuat and Mayan activist, leads Indigenous Permaculture, an organization that is partnering with Pine Ridge residents to develop a local food security project using ecological design principles. The organization is a cooperative of indigenous groups, including Nahuat, Lakota, Shuar, and Maya, as well as non-Native people. Its mission is to share indigenous farming practices and apply environmentally and culturally appropriate technology, in ways that build capacity within the community.

“The goal,” according to the Indigenous Permaculture mission statement, “is to share information, build relationships, and establish a local, organic food source for residents, inspired by indigenous peoples’ understanding of how to live in place.”

At Pine Ridge, Lakota project leader Wilmer Mesteth has been leading the development of the Wounjupi garden and of systems like water catchment and greywater recycling, seed saving, and composting. The initiative sees local food security as a path to confronting poverty and health issues such as diabetes, and is creating a community-supported-agriculture program. A greenhouse has been built; medicinal plants are being cultivated; and workshops are held for residents on perennial agriculture techniques. Last year, there was an excellent harvest, with enough produce to give to families and elders in the community and share with an elders gathering in Montana. While grasshoppers destroyed many other crops on the reservation, the Wounjupi garden saw little damage, probably as a result of the permaculture technique of planting flowers that attract beneficial insects that prey on pests.

“We’re seeing a major change in the soil due to the addition of organic matter,” Vasquez reported. “It’s much darker and richer, and the vegetables are starting to grow really well.” This kind of soil building also has larger positive implications. As a “carbon sink,” soil holds carbon as organic matter, reducing levels of carbon dioxide in the atmosphere (the cause of global warming). Allan J. Yeomans writes in *Priority One* that if the soil fertility of the Great Plains that was destroyed in the past 150 years were to be restored, atmospheric levels of carbon dioxide would be reduced to close to pre-industrial levels. On a global scale, the same results would be achieved if organic matter levels of the world’s agricultural and grazing lands were increased by 1.6 percent.

Vasquez speaks about permaculture as a new form of activism and a healing process. “Up until now,” he says, “educators and universities haven’t recognize indigenous science, and what we’re talking about in this program is indigenous science. So what we’re trying to do here is to share a little about how people can make change, create their own positive solutions to live.”

Vasquez sees the potential of permaculture as a universal philosophy that builds bridges between contemporary and Native cultures through indigenous science. It also has the capacity to strengthen alliances among Native groups, both through its network for traditional knowledge sharing and as a common term for the environmental ethic shared by aboriginal cultures worldwide. “Permaculture is a way of cultural resistance,” he says. “Perhaps the way I plant trees or grow food for my family is the way to create a real green revolution and make change.”

“We work the land together instead of fighting about it”

Permaculture trainings have been held in many countries around the world. An innovative program in Israel, called Bustan, brings Arabs, Jews, and Bedouins together for sliding-scale permaculture courses. Directed by Bedouin activist

Ra'ed Al Mickawi, the courses combine teaching practical techniques in natural building, water catchment, and traditional agriculture with peace building.

"It is connected to peace, in that we work the land together instead of fighting about it," says Petra Feldman, a resident of Hava ve Adam, the permaculture center that hosted the training, where Israeli youth work for a year as an alternative to military service. Her husband, Chaim Feldman, began a collaboration with Palestinian farmers on traditional agriculture. They have shared irrigation techniques, drought-resistant heirloom seeds, and other permaculture practices that allow farmers with restricted access to land to grow more intensively in smaller spaces.

"The closest thing in the world to the principles of permaculture I'm learning in this course are the principles of traditional Bedouin culture," says Haled Eloubra, a Bedouin community leader and green architect who attended a Bustan course in May 2008. "It's the way that you approach nature: in a practical way. In winter in Bedouin culture, you sit by the fire, cook, make tea, tell stories, and use it for many things. Each family had a well that collected rainwater and used it for the herd. Near the house you'd have chickens, a dog, camels, all living together as a system. Unfortunately, since we were moved to cities, it has been difficult for us to continue in the old ways."

Eloubra plans to work on building a "green kindergarten" when he finishes the permaculture course. After getting his degree in architecture, he decided he was committed to creating a building that would be truly useful for his community. He focused on what he felt was most needed in the Bedouin settlements—educational facilities—and realized kindergarten would be the best place to start.

"I wanted to build using natural materials and realized that mud building made the most sense," he says. "In a community without power, it makes sense to build with mud, which has natural insulating qualities that help keep buildings cool in summer and warm in winter. The building will be solar powered, the water will be collected rainwater, and there will be a gray-water system. It will be an efficient, ecological building."

Bustan, the group that is partnering with Eloubra to build the kindergarten, has organized a number of successful projects involving permaculture and indigenous empowerment over the past 10 years. They brought together 500 Jewish and Bedouin volunteers to build an entirely sustainable, solar-powered medical clinic, transformed a school dump into a fruit-producing orchard as an educational project, and founded a center for Bedouin medicine that cultivates traditional herbs. But he sees his work as representing a larger set of issues than just those faced by his Bedouin community.

"The solution for the world's problems today and the diseases within it is to move in the direction of permaculture," he says.

Avoiding Perma-colonialism

Indigenous Permaculture also offers its trainings on a pay-what-you-can basis, open to any participant who is willing to take the information back home and put it to use. Through networking with a variety of native communities worldwide, the aim is to train a cadre of local permaculturists who can share skills with their neighbors.

"If you bring people from outside the community," Vasquez says, "they may not accept a 'permaculture teacher.' People may come and take plants or intellectual property, but they never give back. This has gone on for too many years. Indigenous people need to decide their own destiny."

The issue of traditional knowledge appropriation is addressed by permaculture

teacher Robyn Francis, who has led trainings for 25 years in communities worldwide. She writes about her experience in Indonesia teaching a permaculture design course in 1999, where there was concern among participants about whether “it was just another kind of colonialism: an Australian concept taught by an Australian teacher. The risk is greatest when the teacher sees permaculture as a kind of formula When this happens then, yes, it’s a new permacolonialism. What I see as being the most valuable thing about permaculture, and the greatest challenge for a permaculture teacher to teach, is the process of lateral thinking and questioning, of developing the art of analytical observation.”

This is the indigenous science Vasquez speaks of, a deep integration with the local ecology and awareness of natural patterns and relationships. Observation is the first step in the permaculture design process, which suggests spending at least a year in careful examination of a landscape through its seasons before making any changes to it.

Bill Mollison, often called the “father of permaculture,” worked with indigenous people in his native Tasmania and worldwide, and credits them with inspiring his work. “I believe that unless we adopt sophisticated aboriginal belief systems and learn respect for all life, then we lose our own,” he wrote in the seminal *Permaculture: A Designers’ Manual*.

In a more recent interview in *Green Living* he spoke about how permaculture bridges ancient and modern worldviews: “If I go to an old Greek lady sitting in a vineyard and ask, ‘Why have you planted roses among your grapes?’ she will say to me, ‘Because the rose is the doctor of the grape. If you don’t plant roses, the grapes get ill.’.... [Then] I can find out that the rose exudes a certain root chemical that is taken up by the grape root which in turn repels the white fly (which is the scientific way of saying the same thing).”

Mollison’s perspective—and the permaculture movement in general—connects old and new, lending a detailed Western scientific understanding to traditional agricultural practices developed through indigenous methods, and proven by the test of time. Can this “scientific gaze” function in a way that does not colonize or appropriate traditional knowledge for profit, but rather spreads these practices for the benefit of many?

Histories of empire and forced assimilation into industrial economies have alienated native people from their culture worldwide, creating poverty and environmental destruction. The irony of “teaching” permaculture to people who traditionally lived its principles is not lost on Vasquez, who points out that when he teaches, he doesn’t always use the term.

“We don’t talk about it as permaculture in the indigenous community because we are talking about a way of life. They practice it, and it works, that’s it.”

Francis is excited by the capacity of permaculture to reconnect people from traditional societies with practices endangered by legacies of oppression. In the *Permaculture International Journal* she wrote, “I have found . . . that my students are exhilarated with their awakening awareness of process and creative thinking, and by having a framework of principles of sustainability by which to look afresh at their culture and measure the relative sustainability of remaining traditions and introduced practices.... [There’s] a fresh enthusiasm to rediscover the traditional practices, knowledge, and wisdom that are rapidly being lost.”

The Ka’ala Center has been practicing this type of regenerative permaculture since before the term was widely circulated, starting in 1978 as a youth movement for water rights. Located in Wai’anae on the Hawaiian island of Oahu, the area has one of the largest native populations in Hawai’i, and was once a thriving, self-sufficient community—the “poi bowl,” or breadbasket, of the region.

Today it is nearly impossible to find any food that's locally grown, so poverty and health problems are rampant. Ka'ala receives 4,000 visitors a year, mostly young people. The center teaches traditional canoe and home construction skills, and has restored precontact kalo (taro) pondfields. Founder Eric Enos sees this as a revolutionary act essential to the survival of his people, since according to the Kumulipo, or creation chant, kalo is the elder brother of the Hawaiian people.

Kina Mahi, an organizer at the center, described it as a kipuka, a place of regeneration. "When Pele, the goddess of the volcano, unleashes, she goes down the mountain with her lava trails and everything in her way is destroyed," Mahi says. "The fingers of lava often go around little spots of green, and they remain. That's what a kipuka is. A couple of years ago, our state legislature actually passed a resolution, where they coined the term 'cultural kipuka.' Our people and culture have been bulldozed by a lot of different things. The disconnection of people from land has been the destructive course it's followed. But we have pockets of hope and regeneration like this; we've got our people. So our vision is that someday there will be a kipuka in every community."

Sacred Reciprocity

The vision of a kipuka in every community is exciting not only from the perspective of indigenous empowerment, but as a means to connect non-Native populations to indigenous wisdom. "Everybody can trace themselves to an indigenous culture; everywhere you live there is an indigenous culture that can guide you," Mahi says.

"I think that permaculture is carried inside the body," Vasquez says. "We are all born with this knowledge."

Permaculture's focus on symbiotic relationships is informed by the concept of ayni, a Quechua and Aymara word for sacred reciprocity, an ethic shared by many traditional cultures and sometimes translated as "today for you, tomorrow for me." If the permaculture movement can successfully integrate and spread indigenous science in a way that truly benefits both traditional and modern cultures, perhaps this exchange—this sacred reciprocity—has the power to help guide the future of the planet.

"We have not stopped," Vasquez says, "because we have seen positive results: food, increased biodiversity, grey-water systems, community gardens, sustainable energy. These have made the program move ahead. I swim in the rivers, I smell the pure air, so why shouldn't our children have the right to do these things? We must consider the next generations. That's why we do this work."

Juliana Birnbaum Fox was trained as a cultural anthropologist. For the past 12 years she has been a freelance writer focusing on environmental issues and social justice. In 2005 she founded Voices in Solidarity, a nonprofit organization that builds partnerships with Native-led environmental and social projects in the Amazon rainforest. For more information on projects mentioned in the article, see these websites:

www.indigenous-permaculture.net

www.permaculture.org.au

www.bustan.org



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