



Indigenous knowledge in agriculture: American Indian tribes and Māori communities support indigenous agricultural lifeways

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Meeting:

**78 — Information systems for indigenous knowledge in agriculture
— Agricultural Libraries Special Interest Group**

Abstract:

Over 500 sovereign indigenous nations reside within the geographic boundaries of the United States. Māori are the indigenous people of New Zealand, with iwi (tribes), hapu (sub-tribes) and whānau (extended families) being the main kinship based structures. Many of these tribal communities were traditionally organized around a social ecology that included clans or family connections. For example, the six traditional clans of the Anishinabe peoples are grouped under guardian animals (dodaims) and each are responsibility for specific roles within the community—leadership, learning, defense, justice, sustenance, and medicine. Traditional models illustrate the importance of a balanced life in community wellness. This paper presents examples of American Indian and Māori tribal communities' activities in developing and rediscovering traditional foodways. Specific examples presented include those that are community centered, intertribal initiatives, nutrition and data collection based, and education based. We have selected these cases to not only illustrate these four focuses but also because we have visited the sites or have personal connections with them and can verify their efforts and the respect with which their efforts are recognized within Indian country and/or in indigenous communities.

Community Centered Indigenous Agriculture Initiatives

Tribal communities can launch and sustain community based initiatives to study and recover traditional agriculture. Two successful community based efforts are TOCA and OCIFS.

TOCA: Tohono O’odham Community Action.
(<http://www.tocaonline.org/www.tocaonline.org/Home.html>).

The Tohono O’odham (once known as the Papago) are Desert People, residing in the Sonoran Desert of the USA.¹ With a tribal enrollment population of 28,000 the tribe is the second in size—and reservation land base—in the state of Arizona and is located west of the city of Tucson.²

TOCA is guided by four principles:

1. O’odham Himdag: Wisdom from our past creating solutions for our future
2. Community assets: See our resources, not just our needs.
3. Encourage community self-sufficiency.
4. Context is crucial: strengthening the material roots of O’odham culture.³

TOCA reintroduces growing, gathering, and use of traditional tribal foods. Through food and fitness collaborations, TOCA launched community gardens to grow cultivated O’odham foods such as hal (squash), hun (corn), and bawi (tepany beans) and coordinated educational programs to teach the gathering of traditional foods such as ciolin (cholla cactus buds) and l:ib:hai (prickly pear cactus fruits). TOCA has recently published a book, “From I’Itoi’s Garden: Traditional Foods & O’odham Cooking.” While TOCA seeks first to serve the nutritional needs of its tribal community, it sells some traditional foods such as tepary beans, dried cholla buds, and acorns through the TOCA store. Prepared foods, including desert granola, agave lemonade, and white and green chile stew can be sampled at the Desert Rain Café.⁴

OCIFS: Oneida Community Integrated Food Systems.
(<http://www.oneidanation.org/ocifs/>)

One of the five original Iroquois tribes, the Oneida are also the People of the Standing Stone. Half of the tribe relocated from New York state to northern Wisconsin in the early 1800s.⁵ The Oneida also owns over 10,000 acres of agricultural land and has a 40 acre orchard and they host a seasonal farmer’s market. They plant soybean, alfalfa and winter wheat and lease some land to other farmers.

The philosophy of the agricultural component of OCIFS is called Tsyunhehkwa. Under this program, located on 83 acres, the tribe grows crops, especially the Three Sister plants of corn, beans, and squash and has a solar greenhouse; berry gardens; herb gardens; and room for livestock: chickens, cows, and calves. Buffalo are raised in another area. Community members—including non-Native residents of nearby Green Bay--are invited to participate in annual ceremonies and celebrations including the Green Corn Ceremony. Tobacco burning to commemorate seed planting and gathering, and a fall community harvest and husking bee includes braiding white corn. Corn products—including corn flour, raw and dehydrated corn, and products such as soup and bread--are processed in a facility known as the Cannery and sold at the tribe’s Retail Store.⁶

Intertribal Indigenous Agriculture Initiatives

Intertribal Bison Cooperative.

(<http://www.itcbison.com/index.php>)

The mission of this non-profit organization, which was established in 1991, is “restoring buffalo to Indian Country to preserve our historical, cultural, traditional and spiritual relationship for future generations.”⁷ Members include 57 tribes in 16 states that have a collective herd size of 15,000 buffalo. The Oneida of Wisconsin, noted above, started their buffalo herd with a grant from the Intertribal Bison Cooperative.

Great Lakes Indigenous Farming Conference.

(<http://nativeharvest.com/Indigenous+Farming+Conference+2011>)

One of the most fundamental activities that indigenous communities support is the collection, protection, and use of heritage seeds. The 8th annual Great Lakes Indigenous Farming Conference took place from 3-7 March 2011 on the White Earth Reservation in northwestern Minnesota, USA. Over one hundred people assembled at the event from tribal communities in the United States and Canada, sharing stories and collaborating on the development of Great Lake Seeds Library.⁸

Aquaculture and Traditional Knowledge in the Great Lakes Region.

“Giving Something Back to the Resource”

In the Great Lakes region, members of the Anishinabe and Menominee tribes continue to practice spearfishing as a traditional method of harvesting fish. When the first French fur traders arrived in the region, they observed the people of the Northern Great Lakes Region using torches in their harvest of fish (especially native walleye) that move into shallow waters en masse for nighttime spawning in the spring. By the light of the torches, individuals were able to spear the fish, which were a primary source of food.

For many tribal members in this region, spearfishing is important not only for its cultural and historical value, but as a means of providing a sustainable and healthy food source for the community. Nutrition and the availability of healthy food is a problem for many Native peoples living on reservations in the Great Lakes region. For example, the Menominee tribe, located in Menominee County in East-central Wisconsin, has the lowest indicators of overall health of all 72 counties in the state.⁹ The majority of enrolled members live off reservation for the simple fact that there is little opportunity and resources on reservation.¹⁰ Today, this practice of spearfishing continues under protection of federal treaty rights, on lakes throughout Michigan, Minnesota, and Wisconsin. Across thousands of lakes and almost a million acres of ceded and reservation territory, Native people continue to harvest—and restock—fish.

Restocking these fish is an essential process for tribal communities as they “give back to the resource”—a resource that is shared across jurisdictional and cultural boundaries.¹¹ There are thirteen active tribal hatcheries across three different states, and over the years, tribal fisheries alone have stocked tens of millions of fry in the Great Lakes and several thousand inland lakes and waterways. Up until 2009, the Midwest Tribal Aquaculture Network produced newsletters to disseminate information amongst the thirteen tribal fisheries concerning the latest research, new developments, and practical applications.¹² In the state of Wisconsin, six Lake Superior Chippewa bands and the Menominee Nation have fish

hatcheries ranging from simple facilities for hatching eggs to multi-million dollar facilities such as the Red Cliff Indian Reservation and the Lac du Flambeau.¹³ The hatcheries stock several different breeds of fish, including walleye, northern-pike, muskellunge, lake sturgeon, whitefish, and four different varieties of trout.

Nutrition and Data Collection Based Indigenous Agriculture Initiatives

Alaskan Traditional Diet Project.

(http://www.anthc.org/chs/epicenter/upload/traditional_diet.pdf)

Results of a study of Alaskan Traditional Diet released in 2004 provide a picture of the diets of nearly 700 Alaskan Natives. Response indicate the top fifty foods including subsistence foods including fish (halibut, salmon, yellow-eyed snapper, and pike), berries (blueberries, huckleberries, high bush salmonberries, and crow berries), shellfish (shrimp and dungeness crab), birds, and meat (deer, caribou, moose, reindeer, and elk).

Education Based Indigenous Agriculture Initiatives

Agricultural resources and knowledge in the Navajo Nation.

“Provide guidance to the Diné people in the stewardship of Mother Earth by providing leadership, knowledge, and technological assistance in the management and conservation of her resources, for the inheritance of generations to come.” - Mission Statement of the Navajo Nation Department of Agriculture (NNDA)¹⁴

For the Navajo Nation, there is a need for sustainable agriculture and conservation programs to provide jobs, revenue, and better nutrition for the nearly 170,000 residents living on the reservation. The Diné philosophies of Nizhonigo ‘lina (beauty way of life) and Sa’ah Naaghái Bik’eh Hózhóón (Navajo educational philosophy) are both important to the transmission and management of traditional agricultural knowledge. These philosophies emphasize harmony and balance between people and their environment to promote health and well-being.¹⁵

Land management and use in the Navajo Nation has been deeply affected by the history of allotments and attempts at assimilation of Navajo people by the federal government. Over the last 150 years, there have been numerous problems with over-grazing of sheep and cattle, forced reductions in herds, and the introduction of non-indigenous plants and animals to the land.¹⁶ Sustainable agriculture and the use of traditional agricultural knowledge are beneficial not only to providing better nutrition and employment, but are an important component of Diné self-determination.

To promote education in traditional and sustainable agricultural practices, the NNDA provides training for Navajo Nation community members at a nominal fee. Additional courses on sustainable and traditional agriculture practices, foods, and pest management techniques are offered in conjunction with the University of Arizona Cooperative Extension, the Bureau of Indian Affairs (BIA), and the United States Department of Agriculture (USDA). To support this education, the NNDA has begun leasing out 25 ranches (1,513,907 acres) to tribal members for 10 year terms, with strict land management conditions.

In addition to the work of NNDA, the Navajo Agricultural Products Industry (NAPI) in the Northeast corner of the reservation grows crops, including alfalfa, corn, and pinto beans on 110,630 acres using center pivot irrigation.¹⁷ Crops are sold under the “NavajoPride” name brand. NAPI does employ some non-traditional methods of agriculture to grow traditional crops, but also promotes tribal self-determination through the creation of jobs, educational opportunities, and revenue for the tribe.

Māori Initiatives

New Zealand’s economy is strongly dependent on the agricultural and horticultural industries with approximately forty percent of export earnings coming from these sectors¹⁸. Prior to contact with Europeans and their subsequent settlement in the nineteenth century, Māori food production was focused on a subsistence economy including the gathering of fish and shellfish and the cultivation of crops including, kumara (sweet –potato), taro, yams and mulberry bark. The relationship between Māori and whenua (land) is through whakapapa (genealogy) by common descent through the union of Ranginui (sky father) and Papatuanuku (earth mother). Tāne (the ancestor of humankind) is the brother of Rongo-ma-tane (God of cultivations) and Haumie-tiketike (God of uncultivated crops). European settlers introduced cattle, sheep, poultry and pigs and Māori incorporated these into their agricultural practices. Although until the second world war Māori were largely rurally based (approximately 80% of the Māori population), the technological reforms and loss of Māori land through sales and confiscation led to an urban drift that by the end of the twentieth century resulted in 80% of the Māori population being urban based. From being in complete possession of all land before European settlement, in 1996 Māori only owned 1,515,071 hectares out of a total of 26, 930,907 hectares (or 5.6%).¹⁹ The land left in Māori ownership was largely unproductive and underutilized. However through further reforms made possible by Te Ture Whenua Māori Act 1993 and other regulatory changes led to opportunities for more effective use of land. The changes brought about by Māori land legislation has enabled Māori to establish land incorporations and trusts that have led to commercial operations that make more effective use of Māori land. A report from the New Zealand Institute for Economic Research²⁰ published in 2003, states that Māori land owned by these trusts and incorporations is worth \$NZ1.5 billion and contributes about \$NZ700 million to New Zealand’s economy each year. Large incorporations of Māori land owners have successfully established commercial operations involving agricultural lands. In more recent years, iwi have been progressively settling Treaty of Waitangi claims with the Crown and this has led to monetary compensation and the return of land and other capital assets. These assets are to be developed for the beneficiaries of the settlement, namely registered members of each iwi.

Case studies

Paraninihi ki Waitotara Incorporation of Taranaki.

Paraninihi ki Waitotara (PKW)²¹ is an example of a successful Māori incorporation. These developments have allowed these organizations to develop an increasing level of food sovereignty. This incorporation has approximately 8500 shareholders and was established in 1976. The success of PKW is due to their farming operations on thirteen individual dairy producing farms and two dry stock farms, across 2160 hectares of land. The farm management arm of the Incorporation was established in 1998. The annual output from 7000 cows is approximately 2.3 million kilograms of milk solids. PKW’s production makes it one of the largest suppliers to Fonterra (largest dairy producing company in the world). Amongst

the goals of the Farm Management Group is to provide opportunities for shareholders and their descendants to become involved in farming and to act responsibly as a long term guardian of the land while maximizing the return on investment in terms of productivity and profitability for share-holders. The success of their farming operation has enabled PKW to diversify their portfolio of investments to aquaculture, forestry, property and venture capital opportunities.

Food production amongst Māori is not only focused on large-scale operations. There are also examples of whānau based activities that contribute to local markets and work collaboratively to, have a national identity, share information and support and learn from each other and to incorporate aspects of tikanga Māori (Māori cultural customs) and mātauranga Māori (Māori knowledge) into their practices. Tāhuri Whenua and Te Waka Kai Ora are two examples of these types of collectives.

Tāhuri Whenua Incorporated.

Tāhuri Whenua²² which means ‘returning to the land’ is Māori vegetable growers collective that evolved from a Massey University initiative in the 1990s to reignite the Māori potato crop. A seed bank was established at the university and when harvested they were distributed to interested parties to grow, including whānau, marae (traditional gathering places) and individuals. Through the interest in the potato project, an informal network was established that led to the development of the collective in 2006. Amongst the key objectives of the collective are the desire to see Māori represented in the horticultural industry, support Māori horticultural business development and to facilitate Māori involvement in horticultural research and development, as well as assisting Māori growers to get their products to the market. Although the collective was originally interested in the growing of Māori potatoes, they have diversified their interests to include other crops including traditional crops corn and yams. The collective has the ongoing support of Massey University and has received research funding from a Crown agency that has enabled them to undertake research projects with Plant & Food Research (a Crown Research Institute). The collective recently launched a publication in association with Massey University that focuses on pests and diseases of Māori potatoes²³. It is hoped that further books on aspects of Māori horticulture will be published in the future.

Te Waka Kai Ora.

Te Waka Kai Ora (TWKO)²⁴ is the Māori national organics authority and as organization it supports environmental and cultural sustainability. Its members are drawn from a range of sectors including organic dairy farms, beef and sheep farms and vegetable growers. The Authority has established networks in each region of New Zealand, with regular activities so members can support and learn from each other. The network also distributes educational information to its members about traditional Māori horticultural techniques and appropriate cultural customs that should be followed. Te Waka Kai Ora in 2008 combined with an independent Māori research unit, Te Atawhai o Te Ao to develop a Māori organic brand which has been called Hua Parakore. The brand recognizes producers of organically, environmentally friendly and culturally responsible food. In 2010, TWKO awarded the first brand to Biofarm, producers of organic milk and yoghurt.

Summary

The development of incorporations, trusts and grass-roots trusts has assisted Māori to reconnect with their land and provided opportunities to develop culturally relevant, financially viable and socially responsible produce for the New Zealand and overseas markets. Critical to the success of these organizations has been their ability to base their principles of operation on tikanga Māori and to work together for the common good. It is expected that as Māori continue to benefit from the capital and assets obtained from Treaty of Waitangi settlements, they will continue to develop their agricultural and horticultural investments for the benefit of their shareholders and with compassion for their land. Indigenous peoples residing within the United States are also working to recover traditional lifeways through community centered or intertribal activities. Other efforts focus on education and/or data collection. Together, these developments have allowed these organizations, communities, and tribal nations to develop an increasing level of food sovereignty.

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⁴ TOCA: Tohono O’odham Community Action. Retrieved on April 23, 2011 from <http://www.tocaonline.org/www.tocaonline.org/Home.html>.

⁵ “Oneida,” in Pritzler, Barry M. A Native American Encyclopedia: History, Culture, and Peoples. Oxford, UK: Oxford University Press, 2000.

⁶ “Tsyunhehkwa: Agricultural Page.” Retrieved on April 23, 2011 from <http://www.oneidanation.org/tsyunhehkwa/page.aspx?id=3896>.

⁷ “Intertribal Bison Cooperative.” Retrieved on April 23, 2011 from <http://www.itcbison.com/#>.

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- ⁹ Public Health Institute.
- ¹⁰ Menominee Indian Tribe of Wisconsin: Current Situation and Need. Retrieved on April 22, 2011 from <http://www.menominee-nsn.gov/MITW/aboutUs.aspx>.
- ¹¹ Tribal fish Hatchery Programs of the Northern Great Lakes Region. Retrieved on April 21, 2011 from <http://www.fws.gov/midwest/ashland/TribalIndex.html>.
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- ¹⁷ Navajo Pride: Navajo Agricultural Products Industry. Retrieved on April 21, 2011 from <http://www.navajopride.com/>.
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- ¹⁹ Kingi, T. “Maori Land Ownership and Management, In *Making Land Work – Volume 2: Case Studied on Customary Land and Development in the Pacific*. Canberra, AUSAID, 2008: 129-151.

²⁰ New Zealand Institute of Economic Research. *Māori economic development = Te ōhanga whanaketanga Māori*. Wellington: The Institute. 2003.

²¹ www.pko.co.nz

²² www.tahuriwhenua.org.nz

²³ Roskrige, N. *Ngā pōrearea me ngā matemate o ngā māra taewa = pests and diseases of taewa (Māori potato) crops*. Palmerston North, [N.Z] : Institute of Natural Resources, 2010.

²⁴ www.twko.co.nz