12-2-2014

The Native American Organic Garden: Using Service Learning as a Site of Resistance to the Boarding School Tradition

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Abstract

As educators, we owe it to our students to enable them to transgress structural impediments and to create sustainable alternatives from the margins of the industrial agro-food system. Policies of assimilation, allotment, and enclosure of the Native commons and ecosystems brought devastation to Native American cultures. Dependence on government commodities replaced Native food sovereignty and contributed to malnutrition, obesity, and diabetes as diets responded to corporately produced and processed foods. Young people often feel disempowered and ask how they might confront such formidable forces as corporate control of our agro-food system, destruction of natural resources, and threats to human health. Service learning at a former Native American Boarding School, now a university campus, empowered students to create a community of learning and practice that resulted in a Native American Organic Garden. Based on Native values, the garden serves the community's needs for healthy, locally-produced food. [boarding schools, enclosure of indigenous commons, service learning pedagogy, sustainable agriculture, Native American organic garden, food sovereignty]

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Many scholars concur that changing our broken food system requires a paradigm shift (Altieri 1995; Berry 2003; Cooper and Jarvis 2010; Gliessman 2005; Pretty 2003; McMichael 1994). While current debates revolve around climate change, agriculture has an important impact on environmental sustainability. Given the current ecological crisis of industrial agriculture, we must enable a new generation of students to challenge the industrial model of food production and to develop the knowledge and the skills to revitalize indigenous knowledge and reduce our ecological footprint. We owe it to our students to empower them to transgress the ideological and material impediments to sustainable food production and to create alternatives from the margins of the industrial agrofood system.

This article presents a discussion on how the Native American Organic Garden emerged at a former Native American boarding school, how service learning fostered the development of student designs and implementation plans for an organic garden based on Native cultural and spiritual understandings, and examines how Native gardening maintained biodiversity and nutritional health until Western encroachment disrupted sustainable Native garden practices. The project included outreach plans to ensure broader dissemination of the students' efforts to the community. After integrating these topics with student commentaries on the project, the article examines why a pedagogy of service learning empowers students, and elucidates the importance of this particular project as the school transitioned from a boarding school to the current university campus. The article concludes with a challenge to the complicity of our educational system in perpetuating the kind of knowledge that contributes to environmental crises, and how an alternative pedagogy enabled student resistance.

The Native American Organic Garden

The University of Minnesota-Morris (UMM) is a unique liberal arts campus that offers a "renewable, sustainable education." Originally a Native American boarding school, today it joins a number of other universities and colleges across the nation to promote its "green campus." UMM supports sustainability initiatives such as a biomass gasification plant, wind turbines, solar energy panels, community meals of locally-produced food, a farmers' market featuring the "Pride of the Prairie" brand for locally-produced foods, and a new, green, energy-efficient dorm. In 2005, the campus initiated its Environmental Studies major. Only one course offering, however, specifically addresses the study of the global food system and sustainable alternatives. The course Culture, Food, and Agriculture, first taught in 2007, provides students the opportunity to empower themselves through the service learning garden project.

The UMM organic garden began as a single student's service learning project in 2008. Dan planted the campus' first organic garden by obtaining a grant from the University of Minnesota Institute on the Environment and garden space provided by the university's West Central Research and Outreach Center (WCROC). The university willingly provides strong institutional commitment for sustainable projects such as the organic garden. Out of Dan's initial efforts the UMM Student Organic Gardening Club developed. Based on these initial efforts, in 2011, the course instructor partnered with the coordinator of the Blue Cross-Blue Shield-funded Morris Healthy Eating Initiative (MHE). Mary Jo Forbord coordinates MHE and as an organic farmer, is a strong supporter of sustainability efforts at the campus. Forbord's mission is "to make fresh fruits and vegetables and other healthy foods the easy choice for every meal every day for UMM students, as well as for the residents of Morris…no matter their income or age"

(Simonds-Jaradat 2011). Together, the instructor and Forbord took organic gardening at UMM to a new level.

The course engages students in understanding the development of the industrial food system, but the service learning component places special emphasis on Native American history, cultural traditions, and horticultural practices. Once established, the course now generates continued student involvement through service learning. Students apply the critical perspectives of agroecology as they work in small groups to design the Native American Organic Garden. The learning objectives of the service learning project include: 1) to understand the history and significance of gardening for Native Americans, 2) develop a garden design based on Native American principles, 3) implement a garden plan, and 4) create an outreach plan for dissemination of Native American gardening knowledge and foods to the community. Below, I elaborate on the how the course incorporated these objectives and through student commentaries, how well the objectives were met.

History and Cultural significance of Native gardening

To meet the objective of understanding the history, culture, and significance of traditional gardening, exposure to Native American teachers proved to be one of the more significant components of the project to students. Francis Bettelyoun, of the Yankton Nation and vice president of the Buffalo Star People, South Dakota, is a master gardener who founded and manages the University of Minnesota Native American Medicine Gardens. He shared his knowledge of Native beliefs, landscape design, traditional and organic concepts, and community gardening with the class. This interchange left an important impression on students and sensitized them to Native traditions. Students' comments reveal the influence of these Native teachers on students' thinking. As Kenni stated:

> Francis Bettelyoun told us we cannot simply consider gardening techniques; we have to understand what Native Americans have been through. By retracing our agricultural history and learning about indigenous farming techniques, we become connected to the spiritual practices associated with uniting to mother earth.

Students also attend the Annual Great Lakes Indigenous Farming Conference on the White Earth Reservation where they learn about Indigenous gardening strategies from Native farmers. Winona LaDuke offered the students native White Flint Corn seeds to plant in their garden. A Dakota speaker, Theresa Peterson, visited the class and shared her gardening experiences with students. Seed saving was a cultural priority for reinforcing community relations, seasonal replanting, and maintaining continuity from generation to generation. She offered the class seeds, passed down through generations in her family, for their garden. After learning about corporate production of genetically-modified plants and patenting (see below), the sharing of these family seeds took on particular meaning for the students. Among Native tribes, the best corn was carefully selected, partially shucked, braided into strings, and dried for seed (Spencer and Jennings 1977). Students in the class learned to braid the harvested corn for drying and stressed the importance of creating a seed bank for sharing and future plantings.

In contrast to the 20,000 varieties of Native corn, the upper Midwest today proliferates with yellow corn that serves as cattle feed, for the food processing industry, and a basis for high fructose corn syrup that is a ubiquitous ingredient in most of our processed foods. Unlike traditional corn, hybrid and genetically-modified varieties (GMOs) are deficient in the nutrients that made up Indigenous varieties of corn. In 2003, the White Earth Land Recovery Project (WELRP) conducted a study of seed companies in northern Minnesota and found that 75% of seed varieties were genetically modified (LaDuke 2004). Patenting of GMO seeds leads to legal

battles when pollen from GMOs invades non-GMO fields. Cross-fertilization threatens the disappearance of varieties developed over centuries that are adapted to local microenvironments. Companies like Monsanto sue farmers for "saving" these seeds. Patented seeds turn life into private property so that sustainable, diversified farmers are no longer able to save and share their seeds.

In contrast, Native Americans consider land and seeds to be sacred. LaDuke remarked: "[Corn] is the thread between a living culture and its diverse history…. The whole process is about recovering traditional agriculture and keeping seeds for the generations ahead" (2004:28-31). As Naomi stated, "For Native Americans, seeds not only hold the potential for life, they also hold substantial cultural significance." Students came to realize the significance of traditional seeds and rejected the commoditization of nature for profit accumulation. According to one student report:

> Each seed planted contains not just life but the stories and experiences of countless generations. When planting our Native American garden, it is essential that we pay respect to these traditions, stories, and beliefs by sharing our harvest with the community and recognizing the responsibility that we hold with the seeds we've been given.

Design and Implementation

An important objective of the service learning project, to develop a garden design and implement it into the Native American Organic Garden, enabled students to discover their own capacities for locating human and material resources, making decisions, and implementing their garden designs. Within the course, students worked in teams and were given space to explore and find their own solutions for creating a local, sustainable food project. They met in groups outside of class and each student selected a problem to explore. Students investigated available

community resources such as access to financial support, land, and seeds. They learned techniques used by local organic farmers and Native gardeners, explored campus food services' willingness to incorporate their produce in student meals, and consulted with various community leaders. Although the response from community stakeholders was overwhelmingly positive, this was not easy for those who were accustomed to a clear map to follow:

> Alissa: This was an extremely difficult project for me…because I am so used to exact specifications of what I should do. However, I began to realize that it was the process that was important; it was the education, the learning and the community building that was the key, not designing the perfect garden.
>
> Naomi: Planning the Native Garden has been a huge task that has taken a lot of commitment and thought. I have learned of the importance of collaboration and clear communication, the complexity of planning something physical while working with cultural components different from my culture. Each question that we answered led us to ten more questions. The main thing that we learned was that we are merely opening a door to possibilities as wide as the prairie.
>
> Alex: This project has just been a whirlwind of trial, error, and learning. We were struggling under the weight of everything we had learned, wondering how on earth we were going to pull it all together coherently. My research took me places I never expected to go. There is so much we have put into this project, and infinitely more we have gotten out of it.
>
> Kenni: I distinctly remember having doubts in the beginning of the semester about how great of an impact our garden would have. However, my doubts have now dissipated. I have thought repeatedly that our service-learning project has been

more than a class project. It has really been a community. Our garden epitomizes the values of our campus. It is sustainable, interdisciplinary, community-focused, and Native heritage honoring.

Analysis of students' testimonies affirms their sense of empowerment and commitment to sustainable alternatives. These commentaries reveal students' recognition of the value of working together as a *community* and giving preference to the *process*—which are core values in Native gardening—over the individualized, profit-motive that is so prevalent in industrial agriculture. Although some were initially skeptical, they clearly express empowerment through confronting the admittedly difficult challenges of creating a sustainable alternative and successfully overcoming them.

The Garden Plan

Each group designed and presented its own garden plan. Remarkable is the fact that decisions on the final plan reached a consensus among the several groups. The final plan (see Figure 1) placed a medicine wheel in the center, and designed each adjacent area with a diversity of plants: 1) the NE section established a "Three Sisters" garden of corn, beans, and squash; 2) the NW section included Native American sacred plants of sage, tobacco, and sweet grass; 3) the SE portion inter-cropped onion, beets, turnips, carrots, and cactus; and 4) the SW section made space for melons, peppers, cucumbers, tomatoes, and mint.

<Figure 1 about here>

The medicine wheel (see Figure 2) symbolizes the four sacred directions and each has its sacred plants: East, with yellow plants (e.g., tobacco, goldenrod), represents physical health; South, with red plants (e.g., violet prairie clover, sweet grass), represents emotional health; West is black (e.g., prairie blazing star, sage) and its plants symbolize mental/intellectual health; and

the North's white plants (e.g., white prairie clover, cedar), symbolize spiritual health. By incorporating these understandings into their plans, students rejected the scientific orthodoxy of industrial agriculture and honored a traditional agricultural praxis that privileges biodiversity and the matrix of complex relationships between human communities and their natural environments (Berry 1977).

<Figure 2 about here>

Students recognized that Native Americans of the Upper Midwest "…developed a sense of 'Native Science' in which they planted certain crops together that they found to benefit each other." Native gardeners planted corn, beans, and squash in mounds so as to provide synergistic, mutual benefits to the three plants in each mound (see Figure 3). Beans fix nitrogen in the soil required by corn, corn provides a stalk to support the bean plants, and squash shades the ground to retain moisture and reduce weed growth. Buffalo Bird woman, a Hidatsa woman born in 1839, became an expert gardener and recounted specific details of traditional Hidatsa agriculture to anthropologist Gilbert Wilson (Wilson 1987). In fact, the gardening practices, harvest ceremonies, and recipes she recounted in his book *Buffalo Bird Woman's Garden,* provided important lessons for our students in planning their Native American garden:

> Lyndsey: We would like to use Buffalo Bird Woman's directions as a sort of "recipe" for our garden, following her directions as though she were standing next to us telling us what to do. This is how knowledge was traditionally passed down from generation to generation in Native American culture. Buffalo Bird Woman, in *Buffalo Bird Woman's Garden,* lays out very specific details regarding how and where the crops were placed in the Hidatsa gardeners' Three Sisters garden.

<Figure 3 about here>

An important theme of "food as medicine" emerged as student groups researched Native food traditions. Students learned of the significant connection between food and health for Native Americans. LaDuke (2004:34) believes that "…cultural renewal will be part of a complex recovery process connecting people to the medicine that is food and to our own collective survival." Students learned from reading about Andrew Naytowhow, a Cree Medicine Man's prayer: "Creator, I pray to you for pity and blessing to help mankind return to the ways of the natural medicine placed here by our creator for healing. Today, many people have lost their connection to mother earth and her spiritual gifts. We refer to these gifts as medicine" (Cohen 2003:xviii). Likewise, LaFrance elaborated: "The Three Sisters…are medicine. When we eat them regularly, we stay in good health…. As we drift to Western or foreign diets, we are no longer in balance and disease develops" (LaDuke 2004:6). Reading about these Native American perspectives inspired all student groups to reject the current commodification of crops and to incorporate the Three Sisters and the medicine wheel into their garden plans.

Immersion in the project made students acutely aware that Native American concepts of gardening go far beyond the technical requisites for producing food. Native American agricultural traditions encompass much more than planting crops and meeting nutritional needs. LaDuke, Anishinaabeg activist and author, explains: "Growing food is the centerpiece of the Indigenous relationship to birth and the land" (2004:2). These traditions are rooted in history, local economic systems, and community networks based on cultural context, or what Bowers (2006:17) refers to as "intergenerational, place-based knowledge of the community." An important outcome of the service learning project involved recognition of the contradictory premises of material objectives that undergird

industrial agriculture and the spirituality of gardening to Native Americans. As Kenni commented, “It is important that our university restores the knowledge, traditions, and spirituality that were lost when it was a boarding school.”

Human and Biological Diversity

A significant issue came to light as students planned their garden. An aim of the course was to aid students in gaining appreciation for the diversity among Native American tribes of the Upper Midwest. In recognition of this diversity, students grappled with whether they even had the right to presume they could apply Native knowledge to their garden. A major weakness of the course is the minimal enrollment of Native American students. Although few are Native American, an Ojibwe student served as advisor to the groups and met with them regularly to guide their progress. Students consulted Native American students at the campus Circle of Nations Indian Association (CNIA) and found that they too lacked knowledge of Native American agricultural heritage. This was an important insight into a weakness in the project; future plans are to recruit and increase Native American enrollment in the course.

Native Americans of the upper Midwest practiced diverse food procurement strategies. Some groups hunted buffalo, some were hunters and gatherers who later adopted agriculture from Southwestern groups, and others had raised traditional crops for centuries. Even so, Ojibwe, Hidatsa, Mandan, and Arikara, while distinct, shared common cultural traits. All combined gathering, hunting, and corn agriculture. Before Western intrusion, these tribes sustainably managed the micro-environmental diversity of soils, rainfall, and topography of the Middle Missouri region (Wilson 1987). In upland terraces unsuitable for cultivation, they established their winter villages. All of these tribes cultivated their corn/beans/squash gardens on the flood plain, taking advantage of the alluvial soils. They expanded their gardens to the

northern limits of corn cultivation by developing maize varieties adapted to the short growing season. Trees were burned, a process that softened the soil, destroyed potential weed seeds, and fertilized the soil with ash. Gardens of five to six acres were cultivated two or three years, and then left to fallow (Spencer and Jennings 1977).

The key to the success of Native gardening was the maintenance of environmental biodiversity and nutritional balance. Western expansion, however, seriously disrupted the ecological and nutritional base of Native American cultures. European encroachment exposed Native Americans to a series of smallpox epidemics that decimated their populations (Lehmer and Jones 1978; Spencer and Jennings 1977). The U.S. government land allotment program, enacted through the 1887 Dawes Act, brought major changes to Indigenous culture, economy, and gardening methods and diets. Native understandings of shared resources and stewardship were replaced by privately owned property—a concept foreign to Native values. The value of land and its produce held cultural, social, and spiritual value to the people of Indigenous cultures. From the diversity of traditional Chippewa/Ojibwe foods of wild rice, corn, maple sugar, wild potatoes, and acorns,[1] a century of oppression and dependence on government commodities for sustenance left many suffering the ailments of "progress" (LaDuke 2004).

The Native American organic garden project allowed students to understand that they could break the dependency on these destructive forces and overcome them through engagement in local, sustainable production and maintenance of biodiversity. Students gained important insights on multi-functionality of production through a praxis of project design. Both their planning designs and implementation recognizes the importance of sustainability through biodiversity that simultaneously takes into consideration social cooperation, human skills and knowledge, health and nutrition, and privileges food quality over food quantity:

Lyndsey: By pursuing this project, we are "stewards of the land" and must treat it with utmost respect and honor.

Naomi: Students gained immeasurable significance from their participation in the project: My group rejoiced in this project; we felt as if what we were working on was really going to make a difference. This service learning project has helped me realize the importance of sustainability…this garden will carry a huge significance. We came to realize that this garden is more than merely planting seeds—it involves many, many years of history rich with culture… Through the garden, we will show the importance of food as medicine.

Lyndsey: This service-learning project has opened the door to recovering Native American knowledge and health. Not only have the seeds to restore Native traditions been planted in us, but we hope that the seeds are planted in everyone who steps in our garden or learns about our garden through our outreach efforts.

As these commentaries indicate, a rich historical grasp and appreciation for Native gardening, the importance of land stewardship, and a strong sense of accomplishment, are but a few of the values acquired by students through participation in the service learning project.

Planting the Seeds and Outreach

Once students were ready to plant their garden, Tracy Peterson, of the Diné Nation and associate director of Morris's Multi-Ethnic Student Program, worked out the specifics for spacing in the Three Sisters garden. Gabe Desrosiers, member of the Ojibwe Nation, and instructor of Anishinaabeg language and culture at UMM, performed a blessing ceremony before planting the garden. The ceremony involved blessing both the ground and the seeds by burning

tobacco, offering it in the four sacred directions, and asking the Creator to allow the seeds to grow well. The class invited UMM faculty, staff, students, and Native students from the area high school and the White Earth Reservation to attend.

A final objective of the service learning project was to develop an outreach plan. Involvement in the project inculcated the garden's spiritual value, thus students made a decision not to sell the produce—thus prioritizing use value over exchange value—but rather, to share the food with the campus community. Campus Food Services incorporated a portion of the food into the student menu. UMM also holds periodic community meals prepared from locally-produced foods. These include ingredients from the Native American Garden, along with foods from the Sisseton Wahpeton reservation in South Dakota and the White Earth reservation in Minnesota. The meals include Three Sisters stew, wild rice salad, cornbread, roast buffalo, and chokecherry pudding. In addition, garden surplus can be offered at the local farmers market so as to educate the public on the value of local, organic foods.

In addition to providing foods for the UMM community, students envisioned several long-term plans for continuity of the garden and for public education. One group planned to establish a seed bank for the Native seeds from the garden. To make the Native American Organic Garden interpretive, they planned areas for visitors, including explanatory signs with English and Anishinaabeg names for the plants. A tour script was developed to better educate the public about the significance of the garden. In the future, children will be included in day camps and planting activities. From design, to implementation, to outreach, service learning pedagogy proved essential to engaged student learning and making a difference.

Service Learning Pedagogy

Student commentaries cited above reflect the pedagogical significance of the service learning project. Engaged student learning allowed students to create a local, organic, culturally-sensitive alternative and to contribute to agricultural sustainability. Hence, it is important to highlight the rationale behind service learning pedagogy. Education today faces an immense challenge in adapting to the increasingly complex world for which students are preparing themselves. Students often face that world with uncertainty and a feeling of disempowerment as they confront the current crisis of environmental sustainability. Today educators recognize that Freire's (1968) "banking concept" of education and direct transfer of knowledge from teacher to student is inadequate. Education today requires us to facilitate students to think creatively in new ways, and to apply knowledge-based values and skills through *active* learning and engagement. The *Chronicle of Higher Education* stated: "…maybe it's time that instruction…included more hands-on, traditional skills. Both the professional sphere and civic life are going to need people who have…the practical, even old-fashioned know-how to come up with sustainable solutions" (Carlson 2012). A teaching facilitator parodied a student's thoughts: "Tell me and I will forget. Show me and I will remember. Involve me and I will understand" (Podolfefsky 1997:55). College campuses across the nation are recognizing the importance of practical, applied engagement as a vital service learning tool. A number of these involve students in organic gardening. Below I highlight several of these efforts at Native American tribal colleges.

Despite indoctrination of Native Americans into boarding schools and theft of their lands and resources, tribal colleges are blazing new trails in service learning by revitalizing local food systems through gardening, recuperating food sovereignty, teaching healthy food preservation and preparation, and providing education on nutrition. Many of these efforts aim to confront the growing epidemic of diabetes and obesity that can be traced directly to fast, industrialized,

processed foods. Fort Berthold Community College, for example, serves the Missouri River Valley, the region of traditional corn, beans, and squash production of the Mandan, Hidatsa, and Arikara. As students at the tribal college engage in service learning, they are reviving traditional production methods and providing crops to tribal elders, children, and their families. They also make community garden plots available to families. Phillips (2011) asserts that food sovereignty ensures tribal sovereignty. Given the cultural significance of Native seeds, the college established a Land Lab that maintains a seed bank to preserve heritage varieties of their traditional plants.

In another effort, Northwest Indian College's Northwest Indian Treatment Center involves students in culture-based gardening and cooking as part of their counseling services. It created the Native Foods Nutrition Project in 2005. The center's director reiterated that culture, native plants, and support from spiritual communities are medicines that serve as pillars in recovery programs. They affirm that culture is their medicine (Krohn 2011; Paskus 2011). These, along with service learning initiatives at other tribal colleges, not only contribute to food sovereignty, but provide students with the hands-on learning experience to make a significant contribution to human health and environmental sustainability. The service learning course at UMM is unique from these efforts; once a Native American boarding school, it transitioned into a university campus that now supports Native gardening traditions.

From Boarding School to University Campus

The establishment of the Native American Organic Garden at UMM carries particular significance given its past history. In 1887, during an era that promoted the dispossession of Native Americans from their lands, privatization of communal resources, and assimilation of Native Americans into the dominant society, the federal Office of Indian Affairs established the

Morris American Indian Boarding School in western Minnesota. The Sisters of Mercy administered the school that removed Native children from their families and cultural traditions. The first students came from the Sisseton and Rosebud reservations in South Dakota. Mother Mary Joseph, director of the school, recruited students from the Turtle Mountain Ojibwe reservation in North Dakota. As Native boys learned agricultural skills and girls learned cooking and sewing, government troops carried out the genocide at Wounded Knee, South Dakota, and thus exposed the contradictions of the concurrent practices of ethnocide and genocide. Federal policy changes emphasizing separation of church and state and universal education led the government to cancel its contract with the Sisters of Mercy in 1896.

The United States government assumed control of the school, renamed the Morris Industrial School for American Indians, from 1896-1909. The majority of students were from the Ojibwe reservations of northern Minnesota, including the White Earth Agency. When the government phased out the school, the University of Minnesota took over the facilities and the school transitioned into the West Central School of Agriculture (WCSA) and experiment station. The facility was given to the state with the stipulation that Native American students "shall at all times be admitted to such school free of charge for tuition."[2] The WCSA's mission was to educate youth on contemporary agriculture, animal husbandry, homemaking, and home maintenance skills. Enrollment increased in the post-war years, an era when war technologies were applied to agriculture, and WCSA trained students in "modern" agricultural methods. Today, Agricultural Hall houses the UMM Social Science building whose auditorium is affectionately known as "Cow Palace" for the cattle judging competitions held in the former agricultural school. A picture of a rural landscape hangs in the hall of the building with the

simple word “abundance,” suggestive of a perspective of ever-increasing growth and productivity.

In 1963, the University of Minnesota began to phase out agricultural schools and the WCSA closed. A grassroots citizens’ movement lobbied for a college campus on the site. They prevailed and the state government created the University of Minnesota-Morris as a public liberal arts residential college for undergraduate students. The Native American tuition waiver remains in place and today Native American students, for the large part Anishinaabeg (Ojibwe or Chippewa) and Dakota Sioux comprise 12% of the student population. This history of the school suggests the importance of understanding transitions from traditional Native gardening, the enclosure of Native lands, and the impact of industrial agriculture on tribes of the Upper Midwest. Given this past, it is relevant to inquire as to the role of agriculture in the current agriculturally-induced ecological crisis.

Are Our Educational Systems Complicit in the Agricultural Crisis?

The University of Minnesota, along with over 100 other educational institutions, became a land-grant university in 1868. It is well-recognized that in the post-war era, they trained future farmers to be business managers, rather than environmental stewards. Modern, industrial agriculture preserves assumptions of scientific orthodoxy that permeate education. Secretary of Agriculture Earl Butz, for example, in 1973 admonished farmers to “Get big or get out,” and enforced his progressivist prescription for industrialized monocrop production (Doyle 1985:127). Scientific, linear thinking, Bowers (2006) insists, sets academics apart from the traditional cultural knowledge of Indigenous peoples. In contrast to those who nurture the earth, and seek health of the land, family, and community, the industrial model asks how much the land can produce and seeks profit as the bottom line. According to this line of thinking, “progress”

demands advances in biotechnology and ever-increasing economic growth. Indigenous conceptions based on face-to-face relations, food sharing, spiritual values, and living in harmony with local microclimates was replaced with the exigency to dominate nature and to increase productive efficiency for profit accumulation. For these reasons, our educational institutions hold a responsibility to share in the teaching and renewal of traditional, sustainable values.

Nonetheless, this scientific orthodoxy often permeates college curricula and ignores the very role of our educational system in marginalizing other ways of knowing that are more sustainable (Berry 1977). Indeed, the employment of racist notions and educational hegemony devalues "traditional" knowledge and subsistence-based, sustainable agriculture as a backward constraint on progress and legitimizes the enclosure of Indigenous commons (Berry 1977; Bowers 2006; Fitting 2011). In contrast, the commons encompasses the relationship between daily cultural practices and local ecosystems that entails democratic community management of resources, interdependence, and cooperation. The enclosure of Native commons, however, displaced people, privatized common lands, and imposed market-oriented production systems. This process treated Native Americans as disposable and replaced their sustainable production systems with European crops. As a result, Indigenous peoples suffer poverty, hunger, and increasing inequality (Shiva 2005). Ideologically, the replacement of biodiversity with monocrop production fosters what Shiva calls "monocultures of the mind" (Shiva 1993). Materially, it turned natural resources into capitalist commodities and life-giving seeds into patented private property.

Ignorance of the practices that ensured sustainability of these systems contributes to the current environmental crisis. The food industry burns a fifth of all the petroleum consumed in the U.S. and produces only one calorie of food energy from ten calories of fossil fuel energy (Pollan

2006:85-88). To these maladies we must add loss of biodiversity, deforestation, soil erosion, toxic poisoning of people and the environment with agrochemicals, and food-induced diseases such as E. coli.

Imported foods increasingly make up a major portion of today's diets, provoking increased fuel costs for transporting foods across thousands of miles. Minnesota's West Central Region spends $250 million of its $354 million total food expenditures on food produced outside the region. If 15% of that food were purchased from local farmers, it would create $28 million in new income for the region and reduce the ecological footprint of fuel costs (Chollett and Naidu 2009). Ironically, this principle holds true for Native American communities as well. Winona LaDuke (LaDuke et al. 2010:i) said of this process: "Our communities have also laid the groundwork for agriculture on this continent. Yet today, we produce less and less of our own food and instead rely upon foods imported from factory farms and monocropped fields far away. This is not a sustainable way to live…." One of the great contradictions of our time is the loss of food sovereignty. At the White Earth reservation in northern Minnesota where Native Americans sustainably managed their environments for centuries, today 50% of the tribal economy's resources are spent on food and energy outside the reservation; they produce less than 20% of their own food (LaDuke et al. 2010:3-19).

The shift from home gardening to dependence on fast, processed foods made available through the current model created a serious health crisis. Obesity and diabetes have reached epidemic proportions, and they affect Native American populations to a greater degree. In addition to its ecological benefits, the corn/beans/squash complex provides nutritional benefits unavailable from a single crop. Once consumed, the synergistic interaction of these plants is essential for making calcium, riboflavin, niacin, carbohydrates, cystine, protein, lysine, and

vitamins available for human health.[3] LaDuke et al. (2010) point out other nutritional advantages of Native foods. Hominy provides 47% of the daily recommended fiber and 33% of vitamin B (Thiamine), but has only half the calories of industrial corn. Arikara squash provides 13% of the recommended daily fiber intake, 64% of vitamin A, twice the calcium and magnesium of supermarket squash, but only half the calories. Lima beans traditionally raised by the Potawatomi are high in vitamin B, protein, and carbohydrates, but low in fat. They provide more fiber and antioxidants than industrially-produced beans. Today, however, one in eight Native Americans suffers diabetes, a rate double that of the rest of the population. Over 40% of adults at the White Earth reservation suffer Type II diabetes, and a growing number of children are affected by the epidemic (LaDuke 2004:3).

On the UMM campus, the Morris Healthy Eating Community Food Assessment[4] shows that two-thirds of Minnesotans are obese, in large part due to the availability of fast food and processed foods. The number of young adults in the state who suffer obesity increased from 10% in 1990 to 26% in 2010 (UMM 2010:1,3). Following national trends, 53% of college students at UMM are overweight. Moreover, only 16% of UMM students eat the recommended daily servings of fruit and vegetables. The assessment also demonstrated that these same students desire more healthy foods in their diets. Across the broader community, those in the survey expressed interest in greater availability of fresh, locally-grown foods. Native American students show the highest support among all ethnic groups at UMM for healthier eating and indicated special interest in gardening. The Native American Organic Garden makes an important contribution to addressing these concerns.

Education that Supports the Commons

College curricula too frequently contribute to both the continuing enclosure of Native commons and to the current agricultural crisis. Educators can, however, offer solutions through pedagogies of cooperative service learning that engage students in exploring Native American history, learning from Native gardeners, and designing organic gardens based on Native traditions that value the earth, biodiversity, and Native cultural understandings. Service learning thus becomes a site of resistance for UMM students to create an alternative to industrial, chemically-laced, and genetically-modified monocrop production.

Bowers (2006:35) advocates revolutionizing education from a pedagogy that attends to development of students' minds to a "pedagogy of the earth" grounded on gaining understanding of the cultural knowledge for sustainability that Indigenous peoples developed over the centuries. The White Earth Land Recovery Project founded by Winona LaDuke seeks to revive the traditions of sustainable agriculture and regain food sovereignty based on biodiversity and environmental harmony (LaDuke 2004). LaDuke also founded Native Harvest to support restored production of maple syrup, traditional hominy, white flint corn, organic berries, and wild rice. She founded Honor the Earth to support environmental justice: "The recovery of the people is tied to the recovery of food, since food itself is medicine—not only for the body but also for the soul and for the spiritual connection to history, ancestors, and the land" (LaDuke 2004:33). She added, "…developing food and energy sovereignty is a means to determine our own destiny" (2010:i). Bowers also captures the significance of these efforts in asserting that "…revitalization of the commons represents on-the-ground ways of achieving social justice…." (2006:163). This mandate for creating sustainable alternatives provides a framework and rationale for the Native American Organic Garden, designed and implemented by students at the former Native American boarding school.

Resistance

Analysis of the student comments cited above indicates that the service learning project was indeed a site of resistance for students that empowered students to confront a hegemonic food system and create a local, sustainable alternative. In creating the Native American Garden, students resisted the progressivist perspectives of the former agricultural school. They resisted the industrial model for one of nurturing the land and community, moving from being abusers to stewards of the land. In shifting from large-scale to local, they rejected monocrop production and GMO seeds for biodiversity using Native seeds handed down over generations. They resisted the easy fix of agrochemicals and replaced it with organic methods. Moreover, they resisted the boarding school tradition of assimilation by honoring Native cultures and values. I argue that the complexities of the corporate food system that students confronted and their intense efforts to overcome them (e.g., "a whirlwind of trial, error, and learning") and to create an alternative based on local, organic, and sustainable production was an act of resistance. Despite the "huge task," their reports clearly show their sense of accomplishment. As one student said, the Native American Organic Garden "was really going to make a difference." Indeed, change and resistance can grow in programs like the Native American Organic Garden service learning project.

From the seeds of this service learning project, students have learned, grown intellectually, and gained empowerment by creating a culturally-relevant and locally-sustainable organic garden that carries benefits far beyond what they originally imagined. The project demonstrates that college campuses make ideal springboards for expanding students' knowledge and providing opportunities for immersion in the practicalities of creating sustainable solutions for food production (Love 2012).

Notes

[1] Acorns are but one of several Native foods that prevent impairment of insulin metabolism of the pancreas and thus reduce the incidence of diabetes which is today found in epidemic proportions among Native Americans (LaDuke 2004).

[2] The policy reads: In recognition of the Morris campus history as an Indian Boarding School in the 1800s, federal and state legislatures have mandated that American Indians attending Morris are not required to pay tuition. To be eligible you must: be admitted to the University of Minnesota, Morris; complete the American Indian Tuition Waiver Application; and provide acceptable documentation of blood quantum or blood line/heritage such as Tribal Registration, Certificate of Indian Blood or other legal documentation of American Indian heritage. Applicants are not required to be residents of Minnesota. Recipients will receive direct notification of the American Indian Tuition Waiver from the University of Minnesota, Morris Admissions Office (UMM 2011).

[3] Maize contains complex carbohydrates, but lacks the amino acids lysine and tryptophan, which the human body needs to make proteins and niacin; beans contain both and therefore maize and beans together provide a balanced diet. Squash provides essential minerals (Mt. Pleasant 2006).

[4] Morris Healthy Eating is a Blue Cross and Blue Shield funded project aimed to improve the health of Minnesotans by promoting healthier food choices.

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