

# Community Conservation, Alternative Economy, and Holistic Landscapes: Ethnicity and Farm Household Decision-Making on the Great Plains<sup>1</sup>

Michael Brydger<sup>2</sup> and Kathleen Pickering Sherman<sup>3</sup>

## Abstract

*Federally imposed political boundaries of the Pine Ridge Indian Reservation forced the Lakota to end their nomadic lifestyle and consider other modes of subsistence by 1868. Subsequent federal policies confiscated Lakota lands that were not being used for agriculture and opened those lands to non-Indian agricultural operators. Some Lakota adopted agricultural practices, some worked as farm hands to avoid starvation, while others escaped the assimilative agricultural mandates and continued with traditional natural resource subsistence practices. Despite conflicts with non-Indian homesteaders, some Lakota households practice farming and ranching on the reservation to this day. One question that remains is whether ethnicity and cultural identity influence Lakota agricultural households to make decisions that differ from their non-Indian counterparts. Surveys were administered to seventy-one non-Indian and fourteen Lakota agricultural operators from 2005-2008 to assess agricultural practices, motives and attitudes toward the environment, community values and demographics. An analysis of correlated and closely correlated survey answers from the Lakota and non-Indian subsets reveal significant differences in their attitudes about nature, wildlife and the importance of agriculture relative to wild resources. Differences between agricultural practices, land use strategies, community conservation and economic motives are discussed in this study. [Lakota agriculture, community conservation, Great Plains agriculture, farm household decision-making, environmental ethics]*

## Introduction

Standard economic theory assumes that all actors are rational in the choices they make and that rational actors maximize their utility (Burlington 1962:812). Policy makers often assume that rational actors are motivated by profit maximization and enact economic incentives to entice actors to make desired choices and behavioral changes. Therefore, agricultural policy attempts to create incentives that increase the farm income generated by agricultural operators who adopt the practices that government and society favor (Vogeler 1981; Kroese 2002; Mittal 2002). These economic incentives are often viewed as the only leverage available to influence changes in agricultural practices, even when limited funding means minimal policy impacts on severe ecological, cultural or social consequences produced by the status quo. However, other policy incentives may be created that increase non-economic utilities for agricultural households and allow for greater and more rapid improvements in natural resource conservation, environmental sustainability and carbon sequestration. Ethnicity and cultural preferences may provide examples of

non-economic incentives that might be used to increase the effectiveness of environmental policies.

Though farming and ranching were not traditional means of subsistence for the Lakota, some Lakota on the Pine Ridge Indian Reservation are agricultural operators nevertheless. They are influenced not simply by economic incentives, but by traditional Lakota concepts that are integrated into their agricultural practices. By comparing Lakota agricultural household decisions and attitudes with those of non-Indian agricultural households in South Dakota, Colorado and Montana, this study sheds light on whether the ethnicity of agricultural operators alters the efficacy of policy incentives created to encourage conservation measures.

Furthermore, the voices of ethnic minorities and indigenous peoples have often been muffled by the dominance of both government policy makers and the capitalist economic system. Literature has shown the connections between government policy and capitalism and the marginalization of indigenous peoples, their forced separation from natural resources and the

ecological devastation which ensued (Weisiger 2009; Tucker 2007; Lynn-Sherow 2004; Chase 2002; Pickering 2000; Iverson 1994; Hall 1991; Cronon 1983; White 1983; Carlson 1981). Despite the negative effects of government policy and free market capitalism, historic archaeology and contemporary ethnographies confirm that many indigenous peoples have a strong physical connection to and spiritual relationship with nature (Suzuki and Knudtson 1992; Nabokov 2007). It is through genuine collaboration between western land managers and indigenous peoples that the movement toward sustainable agriculture and natural resource conservation will flourish into the future (Sherman 2006; Pickering, Van Lanen, and Sherman 2009; Ross et al. 2010).

The purpose of this study is twofold: first, to provide evidence that agricultural decision making is influenced by ethnicity and culture, beyond the simple profit motive; and second, to amplify an indigenous voice within the literature on agriculture and sustainability. The overarching hypothesis for this research is that cultural factors influence agricultural household decision making beyond a simple calculation of marginal increases in income. Three specific hypotheses are:

1. Ethnicity and culture influence agricultural practices.
2. Ethnicity and culture influence perceptions of place.
3. Ethnicity and culture influence attitudes about nature.

Considerations of non-monetary aspects, such as community opinions and spiritual reverence, are not adequately accounted for in a cost benefit analysis by agricultural policy makers and are often ignored in neoclassical economic perspectives. The responses to environmental questions by non-Indian agricultural operators of the northern Great Plains are starkly different from responses by their Lakota counterparts in the same region. Lakota differ significantly from non-Indians in relation to their environmental attitudes and conservation practices, including motivations for their agricultural operations,

wildlife conservation and land use strategies, their embeddedness in their local community and local ecosystem and concern for wild plants. By taking cultural and ethnic differences seriously, more effective agricultural policies may be developed that look to non-monetary incentives for increasing conservation practices.

### **Political Ecology: Environmental Impacts of Neoclassical Economics and Agriculture**

A neoclassical economic framework presents nature and natural resources as a commodity with an inherent monetary value within the market economy. Political ecology, in contrast, requires that the environmental impacts of economic practice be included in determining the interplay of political, economic and social factors with the environment (Biersack and Greenberg 2006). According to Steven A. Wolf (2008:203), conventional agriculture is flawed by the inability to measure success without the gradient of profit maximization, where yield is increased by maximizing land utility. From a neoclassical perspective, agricultural operators have fixed inputs (i.e., land base) with which they maximize yields (i.e., wheat per acre) to meet global consumer demands for commodities (Hodgson 1996:383). From a purely economic perspective, produced capital such as soils disturbed by implements, fertilizers, pesticides and herbicides are equivalent substitutes for natural capital, such as naturally fertile soil and an area characterized with moderate to high rainfall. From this perspective, natural resources are non-depletable and non-scarce (Faucheux, Muir and O'Connor 1997:528-529). However, conventional tillage practices loosen the soil and emit large amounts of organic carbon into the Atlantic and Pacific Oceans via water and wind erosion (Smith, Sleezer, Renwick and Buddemeier 2005). The Green Revolution demonstrated how the pace of production with produced capital is unsustainable, both for poor agricultural communities and for the environment, eroding natural resources at alarming rates (Hodgson 1996:382-391; Wolf 2008:203; Zwerdling 2009).

Sustainable agricultural practices are important to maintain a proper balance between the quality and quantity of food production. Accord-

ing to Brian Walker and David Salt (2006), “sustainability is the likelihood an existing system of resource use will persist indefinitely without decline in the resource base or in the social welfare it delivers (165).” Sustainable agricultural practices include, but are not limited to, crop diversification, no-till practices, herd rotation, non-reliance on chemicals (Altiere 2001) and many subsistence practices which minimize ecological disturbance. According to Rappaport (1979:129), religion and ritual were forces that preserved ecological stability. In addition, sustainable, non-Western subsistence systems were dependent on the conceptual structures of these forces (Wilk 2006:151). Sustainability must include a viable interconnection between society, economy and the environment. Thus, sustainable agriculture is not focused solely on economic return, but also on the societal and environmental implications of the practice.

In contrast, standard economic analysis views an increase in profits from industrialized agricultural operations to be adequate justification for increasing harmful inputs (e.g., fertilizers) and decreasing quality of outputs (e.g., low quality beef). Thus economic return is favored over ecological restoration or preservation. Over the long run substituting natural capital with produced capital has resulted in soil erosion, water pollution, soil toxicity and other serious resource depletion, resulting in the loss of billions of dollars annually in the U.S. alone (Glantz 1996; Altieri 2001:31-32; D'Aleo and Grube 2002; Thompson and Turk 2007:242).

### **Lakota Agriculture on the Great Plains**

The vast grassland ecosystems of the Great Plains have been incorporated into the capitalist economy and world market system through agriculture since the mid 1800s. Food produced by agricultural business interests on the Great Plains continues to be an integral part of the global economic system as U.S. agricultural operators sell food to countries around the world. This has an often-ambiguous economic impact on farmers and food security in other parts of the globe, but has provided American farmers with a sense of pride. As one South Dakota farmer stated, “We feed America.” However, agriculture on the Great Plains developed at

the expense of indigenous peoples who once subsisted on native resources on the Plains.

The Fort Laramie Treaty of 1868 formed the Great Sioux Reservation for the “absolute and undisturbed use and occupation” of the Lakota (Hall 1991:3; Utley 1984:232; Kappler 1904). Historically, Lakota hunter-gatherers of the Great Plains subsisted on bison, antelope and deer, along with a variety of wild plants from the Rocky Mountains to the Mississippi River (Fagan 2005:162). They also traded extensively with agricultural communities along the Missouri River like the Mandan and Hidatsa (Hyde 1937; Holder 1970). Their cultural reliance upon *t'iospayes* (extended families), trade relations, horse acquisition and knowledge of animal migrations, cosmology and other natural guides allowed the Lakota to successfully transition to the Great Plains environment from the Great Lakes region (DeMallie 1994; Marshall 2004:49; Fagan 2005:162). Unfortunately these adaptations were not as useful against U.S. militarization and land policy. The federal government mandated sedentary living and diminished the Lakota's access to hunting and gathering resources by creating a heavily regulated reservation system (Pickering 2000:65). Though the Lakota have preserved much of their cultural traditions, they became increasingly vulnerable to the federal government through the impositions of the reservation system, the annihilation of the buffalo and the forced assimilation of American Indians into mainstream American society.

The General Allotment Act of 1887, or Dawes Severalty Act, parceled out 160-acre plots to individual heads of household, undermining the Native American communal landscape (Iverson 1994:28-29). The continual usage of the term ‘agriculture’ throughout the Dawes Act signified federal expectations for the Dakota prairies. Military might, political dishonesty and economic greed appropriated the prime hunting grounds and spiritual epicenters of the Lakota, but that was not enough. Lands not allotted to Indian heads of household were deemed surplus and then given to non-Indian homesteaders. Allotment rapidly degraded the indigenous land base until the Indian Reorganization Act of 1934. Other related policies, such as the Burkes Act of 1906, Homestead Act of 1862 and Indian

New Deal Policies supported federal expectations of a market-based agricultural society, disregarding Lakota environmental ethos (Carlson 1981; Hurt 1987; Flynn 1988:8, 62, 92, 94; Roth 2009:45-46).

Lack of agricultural production on allotted lands was the ostensible reason for confiscation of parcels under the Burkes Act of 1906. Meanwhile, non-Indian farmers and ranchers aimed to maximize land utility for commodity production and capital accumulation through agricultural endeavors (Iverson 1994: 18, 25-51). Concurrently, "Dakota land boomers" rallied on the East Coast awaiting land disposessions (Lazarus 1991:125). Sadly, the federal government fragmented Lakota lands yet again. Fragmented lands were then stripped from the Lakota and sold hastily to white ranchers (Lazarus 1991:125). Federal policy restructured the Lakota's social and environmental landscape in accordance with John Locke's principle. According to Locke, "As much land as a man tills, plants, improves, cultivates and can use the product of, so much is his property" (Hall 1991:3; Opie 1998:61; Merchant 1989:305). This ended Lakota egalitarianism and encouraged greater incorporation into capitalist markets (Pickering and Jewell 2008). Manifest Destiny prescribed a spiritual calling to the settlement and development of the Western territory. Politicians and entrepreneurs used this "spiritual calling" to encourage westward expansion. However, economic gain, territorial expansion and irreverence for indigenous people led to agricultural development on the South Dakota Plains.

As the federal government revised and reneged on treaty commitments to provide land, food and supplies, Lakota displaced from their allotted lands sought employment as agricultural workers to protect their families from starvation (Biolsi 1992; Pickering 2000). With aggressive U.S. government encouragement, some Lakota households on the Pine Ridge Indian Reservation adopted agricultural production as a means of participating in global and local economic markets. Lakota heads of household learned agricultural skills in order to keep their remaining land parcels that had been designated to them by the General Allotment Act or to raise food for *t'iošpayes*. Peter Iverson (1994)

expresses the importance of this era in his book titled *When Indians Became Cowboys*. Regardless of the reason for adopting farming and ranching, the Lakota used agriculture to express emotional, physical and spiritual views of natural resources as interconnected with all aspects of life, not just economics (Suzuki and Knudtson 1992; Nabokov 2007). Lakota and other indigenous cultures instruct decision makers to directly consider the impact of their actions and reciprocal events on the next seven generations (Suzuki and Knudtson 1992).

### Theory in Practice

A political economy framework was used to assess the differences that ethnicity plays in this study. Political economy, a materialist approach based on Marxism, provides an alternative theoretical framework to the neoclassical economic model (Munck 2000: 6-8). A political economy approach examines the economies of a region relative to the cultural, social, political and historical processes that have shaped that region, as well as the dominant economic interests there (Roseberry 1988; Greenberg and Park 1994; Jennings 2000:8). A culturally relativistic, political economic approach combines the historical context and the human and spiritual interactions of natural resources, separating them from the commoditization of resources associated with market exchange and distribution. When examining indigenous or marginalized peoples within a global context, anthropologists often use a political economy lens to explore ways in which the benefits of the competitive global market system do not extend to the periphery of the world-system, including tribal communities internally colonized by core capitalist nation-states (Hall 1989: 11-23). Nonmarket concepts such as redistribution, reciprocity and house holding are critical components of economic practices on the periphery, but are often ignored in the standard economic cost-benefit analyses (Pickering 2000:44-61; Hall et al. 2000:23). Furthermore, by adding the dimensions of political ecology to this analysis, the political, economic, and socio-cultural forces which dictate the human interactions within the environment (Berkes 1999:165), and holistic understandings of the context and considerations of agricultural

household decision making can be included in one conceptual approach (Somma 1993; Greenberg and Park 1994; Walker 1998; Jennings 2000:5-7).

## Methods

Between 2005 and 2007, sixty-eight non-Indian agricultural operators and two Lakota agricultural operators from South Dakota, Colorado and Montana were interviewed by Dr. Pickering Sherman and her ethnographic research team of graduate and undergraduate students from Colorado State University in a study funded by the USDA. The interviews consisted of a mix of qualitative and quantitative questions focusing on agricultural practices, social networks and environmental attitudes. Potential participants were selected randomly from eight counties through local phone books; participants were then selected through a phone interview and followed-up with a face-to-face or phone interview.

Dr. Pickering Sherman and her ethnographic research team conducted additional research during a six-week summer field season on the Pine Ridge Indian Reservation in 2008. Twelve Lakota and three non-Indian agricultural operators on the reservation were administered surveys in person. Three of these agricultural operators were a targeted subsample from 300 household participants in a longitudinal survey of household economic dynamics on the Pine Ridge Reservation from 2000-2008 funded by the National Science Foundation. An additional twelve agricultural operators were identified by the targeted sample through snowball sampling. Though snowball sampling potentially inserts biases, it is an effective methodology to study difficult to find populations or very small subsets (Bernard 2006: 189-194). With so few Lakota households involved with agriculture in this rural locale, using leads from survey respondents allowed the research team to identify potential survey participants. Potential survey participants were contacted via telephone. If they owned an agricultural operation, a survey time was scheduled and surveys were administered face to face. All of the agricultural operators in both studies were engaged in some form of dry land farming or open-range ranching.

The 2008 Pine Ridge subset and the 2005-2007 subset were asked the same or similar survey questions regarding their agricultural operations, demographic information, attitudes towards the environment, community values and participation in conservation practices. A mixed method approach of qualitative and quantitative questioning was utilized in both surveys to strengthen the analyses. Answers to quantitative questions, administered with a five point Likert scale including Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree, were converted to numerical responses. Numerical conversions were utilized to produce statistical means of each respective response and an assessment of statistical significance using independent samples t-test. Qualitative questions were administered to record legitimate and heartfelt responses to the questions. These qualitative responses were used as quotes throughout the study to better understand quantitative answers and the attitudes and emotions of operators towards their operations, the environment, community and policy. Some of the important findings are addressed in the following analysis. To eliminate the possibility of ethnicity being conflated to mask other variables like income, age, education level and acres of land owned, the same statistical tests were run for each variable separately. Of all the possible variables, the most significant factor that emerged was ethnicity.

## Discussion

*Alternative Motives and Traditional Ideas.* Agricultural policy makers assume that increasing farm household income is the critical factor for motivating changes in agricultural practices. For some households this may be true, as one non-Indian farmer explained: "Bankers say Yuma County [is the] hottest county for aggressive farmers. Farm more land, borrow more money and more technology." The prosperity of the community was associated with productivism and access to capital – neoclassical economic measures of success.

However, a cost benefit analysis may not capture the primary reason why Lakota households are involved in agricultural operations. As one Lakota bison rancher stated, "We're not really after the money, that's not our driving

[force].” Lakota agricultural operators are predominantly wheat farmers, cattle ranchers, and bison ranchers. For many of them it is not policy or marginal economic increases that influence their decisions to expand into more sustainable practices. Lakota culture views the natural environment as encompassing animals, plants, *t’iošpayes* (those to be born) and the spiritual forces throughout the natural system. These Lakota perspectives influence agricultural operators towards more holistic and locally integrated operations (Nabokov 2007:50; Pickering and Jewell 2008). For the Lakota, giving back to the community, restoring traditions, restoring the land base and ecological restoration are integrated outcomes that are as motivating as annual household income.

There is an increasing interest in bison ranching on the reservation. Many Lakota families have found ways to reassert their authority over their land through bison ranching. For example, at least three Lakota families with a common land base and common traditional goals have successfully co-managed bison, and initiated the long and delicate process of ecological restoration on their parcels. These families have been able to control decision-making on their lands as they have unified and restored their land base. The ability to use land and restore land from the effects of overgrazing is essential for Lakota cultural continuity. An elder couple who raise bison stated, “We decided a long time ago we would try to bring the buffalo back; the buffalo are more friendly to the land.” Their appreciation for bison is not driven by market economics, but in part by the symbiotic relationship between bison and the land.

Wild grasses that once flourished on the prairie are important food for bison and in effect critical to the reintroduction and viability of the bison’s life ways. The Lakota prefer bison in part because they exist symbiotically with the prairie ecosystem. Bison ranchers are as concerned with contributing to a healthy biotic environment on the reservation as they are with bison profitability. In contrast, many non-Indian agricultural operators were conflicted about changing to greater conservation practices. One Colorado farmer expressed this conflict between his desires and actions when he said, “[I] wish I could go to

grass, but [I] need to make money.”

Bison themselves are a species of special cultural significance to the Lakota. Historically, bison provided sustenance and materials to the Lakota people, as every part of the animal was used for daily, ceremonial and spiritual practices. In Lakota beliefs, the sacred pipe was brought to the Lakota people by White Buffalo Calf Woman. Bison are respected as having their own nation, social organization and natural autonomy (Black Elk 1982).

Five Lakota bison ranchers participated in the 2008 study. As one respondent stated, “We are buffalo people and the money doesn’t matter.” Instead, restoring the land, their family and their cultural traditions take precedence. For example, Lakota bison operators pursued USDA regulations that ultimately allowed for killing buffalo in the field, so the animals could be harvested in a traditional manner, rather than being rendered in a slaughterhouse. In this way, they were able to maintain traditional butchering practices and at the same time they explored new external markets for bison meat. Despite opportunities for mass bison slaughter to meet the growing demand for organic, free grazing meat, the Lakota are more concerned with the sacred and culturally appropriate handling of the animal.

Lakota agriculturalists also mentioned cultural preservation and continuity in addition to ecological resilience when asked about conservation practices on their land. One bison rancher said he applied conservation methods, “For the next generation so the buffalo can grow up, so the bugs can grow up, so the game is always plentiful, I guess you could say.” Conservation methods had nothing to do with the market value of his bison herd, but instead involved the preservation of nature and traditions for the upcoming generations.

While the Bureau of Indian Affairs encouraged Lakota families to lease their allotted lands to non-Indian agricultural operators, more Lakota agricultural operators are now attempting to regain beneficial use of their land. One bison rancher refused to renew his lease contracts with his non-Indian wheat farmers because they continually inquired about using pesticides and they refused to fallow the field

despite his repeated requests. In addition, one elderly Lakota woman commented on Lakota methods for caring for the land. “We try not to do anything other than cut hay. We quit leasing after we figured out what fertilizers do to the land and the air; [we] allow the land to heal itself.” Therefore, the beneficial control of allotted lands is as motivated by conservation practices as by pure economic returns.

Lakota perspectives on agricultural operations reveal alternative motives for engaging in agriculture. Traditional ideas of respect for land, *t’iošpaye* relationships and cultural notions of stewardship all appear in the general responses of bison operators. The next section shows that integration of wildlife into the agricultural landscape by Lakota agricultural operators also distinguishes them from their non-Indian neighbors.

*Land Use Strategies: Wildlife and Acreage Maximization.* Within the capitalist framework, nature and natural resources are commodities with a value dictated by market supply and demand. When income maximization is the sole

motive for agricultural production, land use tends to be limited to active crop production or grazing. Contrary to this neoclassical premise, 78% of Lakota households believed in maximizing land area for animals, birds, and insects to use. In contrast, only 32% of non-Indian households believed in maximizing land area for animals, birds and insects to use (see Table 1).

Of particular interest to policy makers is the response to this land use question when “level of income” is the independent variable. Here, those with the lowest income were most likely to agree that lands should be maximized for wildlife (see Table 2).

Lakota agricultural operators are completely absent from the upper income bracket. These agricultural operators do not regard their land as a commodity to reap a solely monetary profit, but as a natural resource capable of appeasing the owner and local community in spiritual and emotional ways that increased monetary value will not fulfill.

In the Twenty-first Century, Lakota agricultural operators have developed ways of farming

**Table 1:** Attitudinal Questions about Wild Plants and Animals

ETHNICITY BY QUESTION/RESPONSES	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
It is important to have useful wild plants on the farm					
Lakota (N=14)	0	0	0	86%	14%
Non Indian (N=47)	4%	11%	9%	68%	9%
It is important to have wild plants on the farm – even those that aren’t useful					
Lakota (N=14)	7%	29%	7%	57%	0
Non Indian (N=45)	4%	53%	13%	24%	4%
Agricultural crops are more important than plants that are native to this area*					
Lakota (N=14)	7%	50%	29%	14%	0
Non Indian (N=55)	2%	35%	20%	44%	0
I believe that we should try to leave as much land aside as possible for other animals, birds, and insects to use.*					
Lakota (N=14)	0%	14%	7%	71%	7%
Non Indian (N=62)	3%	31%	34%	26%	6%

\*Significant using an independent samples t-test at 95% confidence



**Table 2:** Responses to the question, “I believe that we should try to leave as much land aside as possible for other animals, birds, and insects to use,” based on income.

INCOME LEVELS IN U.S. DOLLARS	PERCENTAGE AGREE
0 - 50,000	91%
50,000 - 100,000	30%
101,000+	19%

and ranching that include Western concepts as well as methods that adhere to cultural traditions and community values. The Lakota have long considered the land sacred for *oyate* (people), land animals, waterfowl, migratory game, and even insects such as grasshoppers that often wreak havoc on agricultural produce. Even the rocks are sacred. A previous study indicated that 95% of Lakota households believed that plants and animals have as much right to exist as humans (Pickering and Jewell 2008). The 78% of Lakota agricultural households that believe they should try to leave as much land aside for wildlife is reflective of Lakota community values (see Table 1).

Several agricultural operators on the reservation keep land in reserve, unassociated from the Conservation Reserve Program, to provide habitats suitable for pheasant, mule deer, turkey and bison hunting. Hunting is a viable source of economic gain within the reservation economy in relation to food production and exchange for many Lakota families. In addition, the art of hunting is still revered among the reservation residents. One bison rancher stated that he conserved land “so we could have it all the time and better quality bucks and better does and stuff like that for the next generation, you know.” Some of the reservation agricultural operators also double as hunting guides to increase their profitability without degrading the natural environment. Though Lakota agricultural operators are integrated within the global economic system, they still consider the affects their operations have on holistic landscapes. Animals, animal habitats and the community play a critical role in Lakota agricultural operators’ decision making.

#### *Local Embeddedness and the Global Economy.*

For Pine Ridge residents, sources of information and decision making of local households depend on local relationships. There are significant differences in how Lakota agricultural households and non-Indian agricultural operators view their duties, obligations and relationships towards the surrounding community. Lakota agricultural operators included in this study expressed deeper obligations to their local community and local ecosystem than their non-Indian counterparts.

Commitments to community and tradition were apparent in a number of Lakota agricultural operators’ practices. For example, buffalo operators were constantly harvesting individual buffalo for ceremonial and cultural events, regardless of whether they would be paid for the animal, because it contributed to the healing and nurturing of the community. A Lakota bison rancher explained the importance of communal giving and restoring traditions when he mentioned distributing meat to the community and elders during business meetings, ceremonies and times of need. In contrast, one non-Indian farmer said he would not give meat to community members because he did not want to create the expectation that he was there to help them out in times of trouble.

Similarly, Lakota agricultural operators expressed greater concerns about the positive impacts their agricultural operations had on their community. The spirit of community remained important for Lakota households, in contrast to a more individualistic and competitive viewpoint among non-Indian agricultural households. Lakota agricultural households often allowed their lands to be used for community-based projects without monetary compensation or other benefits. However, their generosity benefitted the greater community. For example, one agricultural operator donated lands to Oglala Lakota College for a community garden.

There was a considerable difference among Lakota and non-Indian agricultural operators in relation to the people they viewed as most influential in regard to farm operation decisions. Both non-Indian agricultural operators from Colorado, Montana and South Dakota, and Lakota agricultural operators from Pine Ridge



were asked, "Who is the most influential person/group on the reservation/county in regard to farm operation decisions?" For Lakota agricultural operators, 82% claimed that local entities such as family, country folk, the tribal council or the land office were most influential for their decision-making. One Lakota wheat farmer and cattle rancher responded, "I watch a little bit of everybody and put it all together with what I know." The other 18% relied on the federally organized Bureau of Indian Affairs (BIA). In contrast, only 29% of the non-Indian respondents relied on local entities such as families and the farming community, while 42% relied on federal organizations such as the Farm Service Agency (FSA), USDA and the Natural Resource Conservation Service (NRCS) as well as other corporate organizations and representatives such as banks and chemical salesmen. A non-Indian farmer expressed the importance of non-local entities within their farming community when he stated, "USDA [and the] NRCS office kept farming going, like it or not."

The importance of local relationships to Lakota agricultural operators in regard to trustworthy agricultural information was reiterated by the responses to the question, "Who do you trust the most to provide you with accurate/useful agricultural information?" For Lakota agricultural operators, 77% trusted information from local people such as community members, family and the locally operated Oglala Lakota College. Only 29% of the non-Indian respondents trusted the local farm community, neighbors and families for accurate or useful agricultural information. Though agricultural operations are an integral piece of the global economy, the vast majority of Lakota respondents view their operations as a reflection of the culturally embedded ideas within their local community.

*The Value of Non-Agricultural Plants.* Another interesting contrast between Lakota and non-Indian agricultural operators is what they value within their local landscape. In most Western management regimes, wild plants are deemed as "weeds" with no intrinsic value to the market or to agricultural households. The term "weed" does not necessarily mean a plant is entirely undesirable. J. M. Torell (Whitson et al. 2000:ix) describes a weed as, "[a] plant that interferes

with management objectives for a given area of land at a given point in time." In contrast, Lakota agricultural operators, even those who plant wheat, demonstrate a concern for the intrinsic value of wild plants, both in their qualitative and quantitative responses to the 2008 USDA survey. Their management practices do not emphasize elimination of plants.

The large majority of Lakota and non-Indian agricultural operators in this study earn most of their household income from selling agricultural products through commodity markets. From a neoclassical perspective, concern for profitability within the market economy should outweigh concern for the preservation of locally occurring wild plant species. For example, when one non-Indian farmer was asked whether "agricultural crops are more important than plants that are native to this area," he replied, "Depends on the economy."

For non-Indian agricultural operators, the market economy plays the most critical role in their decision-making regarding the plants they raise on their farm. Only 37% of non-Indian agricultural operators felt that native plants were as or more important than agricultural crops (see Table 1). In contrast, 57% of the Lakota respondents believed that native plants were as or more important than agricultural crops. Similarly, 100% of Lakota respondents agreed that "useful wild plants" are important on the farm, while, 77% of non-Indians thought that "useful wild plants" are important on their farms. Furthermore, within Lakota households, 57% agreed that it is important to have wild plants on their farm, even those that were not "useful." In contrast, only 28% of non-Indian households considered plants on their farm that were not "useful" as important. A non-Indian farmer responded when asked about the importance of having wild plants that were not "useful" on his farm, "... if you're talking about a weed, then I disagree, but if it's natural, then you should try to keep them." This statement demonstrates a lack of knowledge about native wild plants in the area. If the term natural was used in lieu of native, many "weeds" are natural. Though many "weeds" are native plant species with intrinsic value to indigenous peoples, they are nearly worthless on the agricultural market.

In fact their eradication through extra tilling and chemical herbicide applications are costly to farmers operating from the neoclassical premise that wild plants do not contribute to market profitability. Even though the agricultural operators were economically dependent on agriculture, Lakota agricultural operators did not automatically regard crops as more important than native plants. To the Lakota, native plants did not interfere with management objectives, thus they were not regarded as weeds. On the contrary, Lakota management objectives include native ecological restoration and providing environments suitable for wild plants.

Part of this contrast in viewpoint between Lakota and non-Indian agriculturalists can be attributed to cultural values. Numerous plants are vitally important to traditional Lakota spiritual, emotional and medicinal practices (St. Pierre and Long Soldier 1995). The reservation communities' reverence for wild plants is reflected in the attitudes of Lakota agricultural operators towards wild plants on their land. In Lakota households, wild plants continue to play a role in the nutrition, ceremonies and social life of the reservation. *Tinpsila* or wild turnip, also called common breadroot scurf pea (*psoralea eschulenta*), is an example of a wild plant important to Lakota people. During earlier periods of nomadic hunting and gathering, *tinpsila* was a primary staple for the Lakota. Skinned, braided and left to dry, these turnips can be preserved for years and boiled in soups with other wild foods. *Tinpsila* is sought after for household use, community gatherings and ceremonial feasts. *Tinpsila* braids are used as a source of trade within the substantive reservation economy and for extra income in tourist shops and roadside stands along the reservation.

Other plants that are still available as food resources on the reservation include: *behaka pejuta* or wild bergamot (*Monardia fistulosa*); stinging nettle (*Urtica dioica*); *pte tawote* or ground plums (*Astragalus crassicaarpus*); *mato tinpsila* or red turnips, also called tall breadroot scurfpea (*Psoralea cuspidate*); *sahielatatinpsila* or Cheyenne turnip (*Lomatium foeniculaceum*); spiderwort (*Tradescantia occidentalis*); *kante* or wild plum (*Prunus americana*); and juniper berries (*Juniperus species pluralis*) (Richard Sherman 2008, personal

communication). Though many of these plants are considered "weeds of the west" (Whitson et al. 2000), they are utilized by Lakota households on the reservation. A previous study revealed that 73% of Lakota households used natural resources for trade and subsistence (Pickering and Jewell 2008:23). Harvesting these plants requires spending time in nature – the sacred Lakota landscape. Supplying traditional food sources to the local community strengthens community relationships, instills cultural integrity and provides healthy food alternatives to Lakota *oyate* (people) in a way in which the monetary profits of neoclassical agricultural practices cannot fulfill.

Some of the medicinal plants widely known throughout the Lakota community include: sweet grass (*Heirolea odorata*); women's sage or *peji hota* (*Artemisia frigid*); chokecherries or *canpa hu* (*Prunus virginiana*); wild licorice or *winawizi ci'kala* (*Glycyrrhiza lepidota*); Echinacea or *ica'hpe hu* (*Echinacea angustifolia*); and buffalo berries or *mastince pute* (*Ribes aureum odoratum*) (Richard Sherman 2008, personal communication; Nabhan and Kindsher 2006). For Lakota households on the Pine Ridge reservation, 84% responded favorably to the question, "How do you feel about traditional healing?" More than 80% of respondents in the 2000-2008 longitudinal study of 300 Pine Ridge households maintained that their spiritual beliefs are connected to the way they feel about nature (Pickering and Jewell 2008:8), with a strong belief that animals and plants are interdependent on one and other to survive. This data confirms the importance of wild plant for traditional methods of healing and spiritual fulfillment on the reservation. Lakota agricultural operators fulfill a cultural need by respecting wild plant growth on their properties, while simultaneously providing community access to medicinal plant sources.

Plants also play a key role in local conception of place and history (Basso 1996; Braudel 1980:3; Nabokov 2007). A wheat farmer from a Lakota household delighted in an old cottonwood tree and the connections he had to it as a boy when we toured his property. This tree, growing in a lush canyon adjacent to his farm fields, has no monetary value for the farmer. It provides no direct benefits such as shade from the summer sun or a break from the winter wind, yet his emotional and psychological connections to the cottonwood

supersede any capitalist economic motive of valuing the tree as an income source. This dying tree and others that line the accessible canyon would bring large monetary harvests on the reservation where many residents depend on firewood for protection from the winter cold.

In addition, a percolating natural spring keeps the canyon moist and abundant with plants. One plant in particular dries out during the month of July. Once the flat, transparent pod is removed, seeds remain which provide tastes of garlic and Italian seasoning. These seeds provide no greater means of incorporation into the global market system for the farm household. However, the ability to spice up Italian dishes from a wild plant, just out the backdoor, increases dependence on the intricacies of nature as opposed to market commodities that include arms-length dealing and environmental and social exploitation. This wheat farmer, like many Lakota agricultural operators, took great pride in the amount of wild resources he has preserved on his farmland, subsequently preserving culture and place.

## Conclusion

The Lakota have joined the ranks of other agricultural operators as players within global commodity markets. However, there is ample reason to believe that Lakota agricultural operators use alternative economic concepts and culturally based considerations to analyze their options and make agricultural household decisions. The purely economic cost-benefit analysis is not a traditional Lakota concept and is not regarded as the most important consideration for Lakota household decision making today. Land policies were intended to enforce Native American assimilation through commodity agriculture. Though some traditional Lakota hunter-gatherers adopted farming and ranching, much of their cultural values of community, the environment and spiritual reverence for land and animals persist today. In addition, reliance upon traditional food sources for spiritual engagement, physical and emotional healing, and empowerment is necessary for Lakota cultural continuity. In contrast, the non-Indian responses to the agricultural operator surveys are more representative of the values

assumed in neoclassical economics and underlying agricultural policies within the northern Great Plains.

The Lakota agriculturalists place cultural continuity above monetary value concerning their agricultural operations, decreasing harvest capabilities in favor of havens for wild animals and plants on their lands. Lakota agricultural operators remain locally embedded and their practices reflect traditional community values. In contrast to non-Indian agricultural operators throughout the northern Great Plains, the Lakota place physical, spiritual and emotional significance on non-agricultural plants. To achieve greater sustainability on the Great Plains, policy makers need to expand incentives to embrace alternative agricultural values and practices such as those used by Lakota households. Alternative modes of agriculture and ethnic based decision-making should be evaluated and considered through focus groups comprised of Lakota agricultural operators and policy makers. In addition, further research is needed to assess the implications of Lakota practices on Great Plains ecosystems compared to agricultural operators utilizing a cost benefit analysis. Alternative viewpoints of the Lakota and others must be acknowledged and critically examined to provide a future for agriculture, ecosystems and the local and global communities dependent on food production. ○

## Notes

1. This research was supported by the USDA Cooperative State Research, Education and Extension Service NRICGP Rural Development Grant No. 2005-35400-15294, by a National Science Foundation Career Award Grant No. 0092527, and the Monfort Family Foundation's Colorado State University Monfort Professorship. We would like to acknowledge all the agricultural households who responded to our questions. Special thanks to Richard Sherman and the diligent students of the 2007 and 2008 CSU Ethnographic Field School, and to the data analysts of the 2008 Ethnographic Field Preparation course at Colorado State University.

2. Michael Brydge is an undergraduate in the Department of Anthropology, Colorado State University. He can be contacted by mail at the

Department of Anthropology, Colorado State University, Fort Collins, CO 80523-1787 or by e-mail at [mkbrydgc@rams.colostate.edu](mailto:mkbrydgc@rams.colostate.edu).

3. Kathleen Pickering Sherman earned her Ph.D. in anthropology from University of Wisconsin-Madison. She is professor and chair of the Department of Anthropology, Colorado State University. She can be contacted by mail at the Department of Anthropology, Colorado State University, Fort Collins, CO 80523-1787 or by e-mail at [Kathleen.Sherman@colostate.edu](mailto:Kathleen.Sherman@colostate.edu).

## References Cited

- Altiere, Miguel A.  
2001 *Genetic Engineering in Agriculture: The Myths, Environmental Risks, and Alternatives*. Oakland, California: Food First/Institute for Food and Development Policy.
- Basso, Keith H.  
1996 *Wisdom Sits in Places*. Albuquerque, New Mexico: University of New Mexico Press.
- Berkes, Fikret  
1999 *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Philadelphia, Pennsylvania: Taylor and Francis.
- Bernard, H. Russell  
2006 *Research Methods in Anthropology: Qualitative and Quantitative Approaches*. Fourth edition. Lanham, MD: AltaMira Press.
- Biersack, Aletta, and James B. Greenberg, Eds.  
2006 *Reimagining Political Ecology*. Durham, North Carolina: Duke University Press.
- Biolsi, Thomas  
1992 *Organizing the Lakota*. Tucson, Arizona: University of Arizona Press.
- Black Elk  
1982 *The Gift of the Sacred Pipe*. Recorded and edited by Joseph Epes Brown. Norman, Oklahoma: University of Oklahoma Press.
- Braudel, Fernand  
1980 *On History*. Chicago, Illinois: University of Chicago Press.
- Burling, Robbins  
1962 "Maximization Theories and the Study of Economic Anthropology." *American Anthropologist* 64(4):802-821.
- Carlson, Leonard  
1981 *Indians, Bureaucrats, and the Land: The Dawes Act and the Decline of Indian Farming*. Westport, Connecticut: Greenwood Press.
- Chase, Jaquelyn Ed.  
2002 *The Spaces of Neoliberalism: Land, Place, and Family in Latin America*. Bloomfield, Connecticut: Kumarian Press.
- Cronon, William  
1983 *Changes in the Land: Indians, Colonists, and the Ecology of New England*. New York, New York: Hill and Wang.
- D'Aleo, Joseph S. and Pamela G. Grube  
2002 *The Oryx Resource Guide to El Nino and La Nina*. Westport, Connecticut: Oryx Press.
- Fagan, Brian  
2005. *Ancient North America: The Archaeology of a Continent*. Fourth edition. London: Thames and Hudson Ltd.
- Faucheux, Sylvie, Eliot Muir, and Martin O'Connor  
1997 "Neoclassical Natural Capital Theory and 'Weak' Indicators for Sustainability." *Land Economics* 73(4): 528-552. Accessed April 8, 2009 at <http://www.jstor.org/stable/3147244>.
- Flynn, Sean J.  
1988 *Western Assimilationists: Charles H. Burke and the Burke Act*. MA Thesis, Department of History. Lubbock, TX: Texas Tech University.
- Glantz, Michael H.  
1996 *Currents of Change: El Nino's impact on climate and society*. New York, New York: Cambridge University Press.
- Greenberg, James B. and Thomas K. Park  
1994 "Political Ecology." *Journal of Political Ecology* 1(1):1-12. Accessed August 30, 2009 at [http://jpe.library.arizona.edu/volume\\_1/ascii-forward.txt](http://jpe.library.arizona.edu/volume_1/ascii-forward.txt).
- Hall, Charles A.S., Peter W. Jones, Therese M. Donovan and James P. Gibbs  
2000 "The Implications of Mainstream Economics for Wildlife Conservation." *Wildlife Society Bulletin* 28(1, Spring):16-25. Accessed April 8, 2009 at <http://www.jstor.org/stable/4617279>.
- Hall, Thomas D.  
1989 *Social Change in the Southwest, 1350-1880*. Lawrence, Kansas: University Press of Kansas.
- Hall, Philip S.  
1991 *To Have This Land: the Nature of Indian/White Relations, South Dakota, 1888-1891*. Vermillion, South Dakota: University of South Dakota Press.

- Hodgson, Geoffrey M.  
1996 "Varieties of Capitalism and Varieties of Economic Theory." *Review of International Political Economy* 3 (3, Autumn):380-433. Accessed April 8, 2009 at <http://www.jstor.org/stable/4177194>.
- Holder, Preston  
1970 *The Hoe and the Horse on the Plains*. Lincoln, Nebraska: University of Nebraska Press.
- Hurt, R. Douglas  
1987 *Indian Agriculture in America: Prehistory to Present*. Lawrence, Kansas: University of Kansas Press.
- Hyde, George E.  
1937 *Red Cloud's Folk: A History of the Oglala Sioux Indians*. Norman, Oklahoma: University of Oklahoma Press.
- Iverson, Peter  
1994 *When Indians Became Cowboys: Native Peoples and Cattle Ranching in the American West*. Norman, Oklahoma: University of Oklahoma Press.
- Jennings, Tori Lee  
2000 *Living with Uncertainty: Adaptive Strategies for Sustainable Livelihoods in the Northern Great Plains*. MA Thesis, Department of Anthropology. Fort Collins, CO: Colorado State University.
- Kappler, Charles J. Ed.  
1904 "Treaty with the Sioux-Brulé, Oglala, Miniconjou, Yanktonai, Hunkpapa, Blackfeet, Cuthead, Two Kettle, Sans Arc, and Santee- and Arapaho, 1868." *Indian Affairs: Laws and Treaties*. Volume II Treaties 15 Statutes 635. Washington, D.C.: Government Printing Office. Accessed December 20, 2009 at <http://digital.library.okstate.edu/kappler/VOL2/treaties/sio0998.htm>.
- Kroese, Ron  
2002 "Industrial Agriculture's War Against Nature." In *Fatal Harvest: The Tragedy of Industrial Agriculture*. Edited by Andrew Kimbrell. Pages 21-27. Chicago, Illinois: Island Press.
- Lazarus, Edward  
1991 *Black Hills/White Justice: the Sioux Nation Versus the United States: 1775 to the Present*. New York, New York: Harper Collins.
- Lynn-Sherow, Bonnie  
2004 *Red Earth: Race and Agriculture in Oklahoma Territory*. Lawrence, Kansas: University of Kansas Press.
- Marshall, John M.  
2004 *The Journey of Crazy Horse: A Lakota History*. New York, New York: Penguin Group.
- Merchant, Caroline  
1989 *Ecological Revolutions: Nature, Gender, and Science in New England*. Chapel Hill, North Carolina: University of North Carolina Press.
- Mittal, Anuradha  
2002 "Giving Away the Farm: The 2002 Farm Bill." *Food First Backgrounder* 8(3):1-6.
- Munck, Ronaldo  
2000 *Marxism @ 2000: Late Marxist Perspectives*. New York, New York: St. Martin's Press.
- Nabhan, Gary and Kelly Kindsher  
2006 *Renewing the Native Food Traditions of Bison Nation: A Manifesto on Behalf of the Renewing America's Food Traditions Consortium (RAFT)*. Flagstaff, Arizona: Northern Arizona University.
- Nabokov, Peter  
2007 *A Forest of Time: American Indian Ways of History*. New York, New York: Cambridge University Press.
- Opie, John  
1998 *Nature's Nation: an Environmental History of the United States*. Fort Worth, Texas: Harcourt Brace College Publishers.
- Pickering, Kathleen  
2000 *Lakota Culture, World Economy*. Lincoln, Nebraska: University of Nebraska Press.
- Pickering, Kathleen and Benjamin Jewell  
2008 "Nature is Relative: Religious Affiliation, Environmental Attitudes, and Political Constraints on the Pine Ridge Indian Reservation." *Nature and Culture* 2(1): 135-158.
- Pickering, Kathleen, James Van Lanen and Richard Sherman  
[under review] "From Physical Alienation to Resilient Animism: Prospects for Community-Based Natural Resource Stewardship on the Pine Ridge Reservation." *Human Ecology*.
- Rappaport, Roy A.  
1979 *Ecology, Meaning, and Religion*. Richmond, California: North Atlantic Books.
- Roseberry, William  
1988 "Political Economy." *Annual Review of Anthropology* 17:161-185.

- Ross, Anne, Kathleen Pickering, Jeffrey Snodgrass, Henry Delcore and Richard Sherman  
[Under review] *Knowledge Binds: Indigenous Peoples and the Tangle of Natural Resource Management*. Book manuscript under review. Walnut Creek, CA: Left Coast Press.
- Roth, Bridget  
2009 *Understanding Attitudes, Norms and Behaviors About Market-Oriented Consumption on the Pine Ridge Reservation, South Dakota*. MA Thesis, Department of Anthropology. Fort Collins, Colorado: Colorado State University.
- Samuelson, Amy Louise  
2006 *Conservation Decision Making of Agricultural Producers in the Great Plains*. MA Thesis, Department of Anthropology. Fort Collins, Colorado: Colorado State University.
- Sherman, Richard  
2006 *Indigenous Stewardship Model: A Traditional Strategy to Restore Ecosystem Balance and Cultural Well Being Utilizing Values, Philosophies, and Knowledge Systems of Indigenous Peoples*. Unpublished Manuscript.
- Smith, Stephen V., Richard Sleezer, William Renwick, and Robert W. Buddemeier  
2005 "Fates of Eroded Soil Organic Carbon: Mississippi Basin Case Study." *Ecological Applications* 15(6):1929-1940. Accessed August 30, 2009 at <http://www.esajournals.org/doi/pdf/10.1890/05-0073>.
- Somma, Mark  
1993 "Theory Building in Political Ecology." *Social Science Information* 32(3):371-385.
- St. Pierre, Mark and Tilda Long Soldier  
1995 *Walking in the Sacred Manner: Healers, Dreamers, and Pipe Carriers – Medicine Women of the Plains*. New York, New York: Simon and Schuster.
- Suzuki, David and Peter Knudtson  
1992 *Wisdom of the Elders: Sacred Native Stories of Nature*. New York, New York: Bantam Books.
- Tauxe, Caroline  
1992 "Family Cohesion vs. Capitalist Hegemony: Cultural Accommodation on the North Dakota Farm." *Dialectic Anthropology* 17(3):291-317.
- Thompson, Graham R. and Jonathan Turk  
2007 *Earth Science and the Environment*. Fourth edition. Belmont, California: Thomson Brooks/Cole.
- Tucker, Richard P.  
2007 *Insatiable Appetite: The United States and the Ecological Degradation of the Tropical World*. Concise Revised Edition. Lanham, MD: Rowman & Littlefield Publishers, Inc.
- Utey, Robert Marshall  
1984 *The Indian Frontier of the American West 1846-1890*. Albuquerque, New Mexico: University of New Mexico Press.
- Vogeler, Ingolf  
1981 *The Myth of the Family Farm: Agribusiness Dominance in U.S. Agriculture*. Boulder, Colorado: Westview Press.
- Walker, Brian and David Salt  
2006 *Resilience Thinking: Sustaining Ecosystems and People in a Changing World*. Washington D.C.: Island Press.
- Walker, Peter  
1998 "Teaching Political Ecology." *Capitalism, Nature, and Socialism* 9(1):131-144.
- Weisiger, Marsha L.  
2009 *Dreaming of Sheep in Navajo Country*. Seattle, WA: University of Washington Press.
- White, Richard  
1983 *The Roots of Dependency: Subsistence, Environment, and Social Change Among the Choctaws, Pawnees, and Navajos*. Lincoln, Nebraska: University of Nebraska Press.
- Whitson, Tom D., Larry C. Burrill, Steven A. Dewey, David W. Cudney, Burrell E. Nelson, Richard D. Lee and Robert Parker  
2000 *Weeds of the West*. Ninth Edition. Newark, California: Western Society of Weed Science.
- Wilk, Richard  
2006 "‘But the Young Men Don’t Want To Farm Anymore’: Political Ecology and Consumer Culture in Belize." In *Reimagining Political Ecology*. Edited by Aletta Biersack and James B. Greenberg. Pages 149-170. Durham, NC: Duke University Press.
- Wolf, Steven A.  
2008 "Professionalization of Agriculture and Distributed Innovation for Multifunctional Landscapes and Territorial Development." *Agriculture and Human Values* 25(1):203-207.
- Zwerdling, Daniel  
2009 "Green Revolution: Trapping India’s Farmers in Debt." National Public Radio. April 14.