Strengthening Sustainable Agriculture Practices on American Indian Lands in the Western United States

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Abstract
This paper presents the preliminary results of the analyses of primary data collected between 2005 and 2006, from American Indian producers, tribal leaders and agriculture professionals working on reservations in Nevada, Washington, Oregon and Idaho. The purpose of collecting and analyzing these data is to provide insight into perceptual differences regarding quality of life issues on American Indian reservations in the western United States. Perceptions of quality of life issues are compared between American Indians who live on reservations and agriculture professionals who work with American Indian producers and tribal officials on reservations. The short-term goal is to identify perceptual differences that may impede the efficacy of agriculture professionals to work with American Indian producers. The middle-term goal is the utilize the results of this applied research to develop a Western Region Sustainable Agriculture Research and Education (SARE) training program that targets the educational needs of agriculture professionals who work on reservations with the long-term goal to strengthen sustainable agriculture practices on reservation lands.

Keywords: American Indian, sustainable agriculture, assessments
Introduction
The Western Region Sustainable Agriculture Research and Education (W.S.A.R.E.) professional development program addresses the educational needs of agriculture professionals working with American Indian Tribal governments and American Indian producers in the western United States. While almost every reservation works with agriculture professionals, including Cooperative Extension, most programs are not specifically designed for American Indian agriculture producers or Indian tribes.

In order for these educational programs to succeed, agriculture professionals must understand and develop an appreciation for the history, culture and socioeconomic conditions of individual tribes with which they work (Hart, 2006). Also, in order to facilitate American Indian adoption of more sustainable agriculture and natural resource management practices, it may be necessary for agriculture professionals to understand the perceptions of American Indians concerning their experiences living on reservations. The research described in this paper attempts to address this latter knowledge gap through a comparison of American Indian perceptions of quality of life on reservations with those of agriculture professionals working with American Indians on reservations.

Purpose and Objectives
This paper describes research conducted between 2005 and 2006, using primary data collected from interview surveys with American Indian producers and tribal leaders. In addition, an internet survey was conducted with agriculture professionals working on reservations. The purpose of conducting two surveys was to collect perceptual information that might assist in developing and piloting an educational program that targets agriculture professionals working on reservations.

The objective of creating an educational program based on this type of applied research is to increase the efficacy of agricultural professionals to work with American Indians. Presumably, if obvious differences exist concerning the perceptions of quality of life on reservations, agriculture professionals may benefit from being made aware of these differences.

Methods and/or Data Sources or Theoretical/Philosophical Themes
Research methods featured two surveys similar in content but different in terms of implementation. An interview survey was conducted on participating reservations in the targeted western states of Nevada, Idaho, Washington and Oregon. In addition, to increase respondent numbers, the survey was administered to willing participants who attended the 2005 Indian Agriculture Council (IAC) conference. The IAC conference is a national conference although the majority of participants are from the western United States.

Coincidently, an internet survey was conducted of agriculture professionals working on reservations in the four-state western sample region that included Nevada, Idaho, Washington and Oregon. These combined methodologies were selected in order to compare perceived quality of life on Indian reservations between these two groups. Specifically, identical survey questions enabled comparison and contrast of attitudes towards issues of importance on reservations.

For the purpose of this study, a set of 68 survey items were developed to assess American Indian perceptions of quality of life on reservations and potentially identify obstacles and opportunities for implementing sustainable agricultural practices. These questions were developed using an eclectic mix of conceptual frameworks from rural sociology, economic and community development and natural resource management literature and practice (Theodori,

The resulting conceptual framework included four categories of quality of life concerns. The categories included: 1) assets; 2) economic development needs; 3) agriculture land use issues and; 4) water quality and conservation issues. Items that measured perceived assets on reservations included, for example, access to colleges and/or vocational schools. Items that measured economic development needs included, for example, improve quality of K-12 education on reservations and promote tourism on reservations. Agriculture and land use issues featured items that included lack of organization in addition to conflict among tribal government officials as well as the costs associated with farming and ranching. Water quality and water conservation issues dealt with concerns involving water quality management and riparian area management on reservation lands. Each question used a five-point equal weighted Likert-type scale.

Identical question items were included in the internet survey to assess agriculture professionals’ perceptions and appreciation of quality of life issues of importance on American Indian reservations. These questions were presented and worded so as to enable professionals to express their perceptions of these issues based on their experiences working on reservations with American Indians.

In addition, questions were asked to collect demographic information about the respondents. For the American Indian respondents, these included the number of years respondents had lived on reservations, their age, and marital status, number of children living with them, ethnicity, income and highest level of educational attainment.

Demographic questions for agricultural professionals included number of years worked as an agricultural professional, number of years worked on American Indian reservations, time spent each year working on reservations, professional agency or organization affiliation and geographic area and state in which they worked.

The final questionnaires for both groups were reviewed by a panel of three university-based faculty members in Nevada familiar with both public opinion and perceptual survey methodology. The questionnaires were also reviewed by the officers of the IAC and selected American Indian tribe officials who were omitted from the study sample. Revisions were made based upon their recommendations to increase content validity. The purpose of these reviews was to identify missing skills and to check for clarity and comprehension of survey questions.

Results, Products, and/or Conclusions
Completed interview and internet survey questionnaires served as the data sources for this study. The data were analyzed utilizing the Statistical Package for Social Sciences (SPSS, Version 13.0) for Windows XP. Cronbach’s coefficient alpha (CCA) was used to estimate internal consistency of the 68 Likert-type scale items. The Cronbach score for the 68 items was high (r = .925). This score indicates that there was high internal consistency between variables (Carmines & Zeller, 1979).

American Indian survey respondents
The majority of American Indians who completed this survey (n = 96) live on reservations in Washington (21%). This was followed by Montana (16%), Arizona (11%), Oregon (10%), Idaho (7%) and Nevada (6%).
Approximately 46% of American Indian respondents live on reservations that are combinations of allotted and assigned lands. This was followed by 39% who live on reservations that are solely allotted lands, with 14% residing on solely assigned lands. For definition purposes, allotted lands are lands that were allocated to individual Indians under the General Allotment Act of 1887 also known as the Dawes Act. The purpose of this federal legislation was to help American Indians assimilate into pioneer culture by allotting land, money and sometimes livestock to individuals to encourage farming and ranching as livelihoods on reservations. Assigned lands are assigned to individual tribal members for use but are owned by a tribe as a whole and remain under tribal jurisdiction. Assignments last the lifetime of the individual.

The majority of American Indians who responded to the survey (74%) were over 40 years of age. However, in contrast, the majority of respondents (30%) reported having lived on a reservation for 11 to 20 years while 23 percent had lived on a reservation for 10 or less years. Those American Indians who responded to the survey reported above average education levels. That is, the majority (27%) reported having earned a 4-year degree while 9 percent earned advanced or graduate degrees. Twenty-one percent had earned an associate or technical degree while nearly a quarter of the respondents (26%) had earned some college credits. In addition income levels reported illustrate a normal distribution with the majority of respondents reported earning annually between $35,000 and $49,999 (27%) followed by those who earned $50,000 to $99,999 (24%).

The good news for agricultural professionals working on reservations, is that more than half (63%) of American Indian respondents reportedly used Extension programs in the past. Almost the same number (58%) reported having used NRCS programs in the past additionally. Based on this survey result, it appears that at least some Cooperative Extension and NRCS programs are useful to American Indians living on reservations and/or outreach mechanisms are working at least half the time.

Overwhelmingly, the majority of American Indians who responded to the interview surveys use the internet and their computer. However, the majority of American Indian respondents indicated that they prefer in-person trainings via seminars and workshops—this nearly tied with receiving educational printed materials. Internet trainings and educational information via newspapers followed these educational methods.

**Agricultural professionals survey respondents**

In examining the internet survey results for agriculture professionals (n = 212), the majority who responded reported they worked in Idaho (43%), followed by Nevada (30%), Washington (19%) and Oregon (9%). The majority of respondents (66%) selected “other” as their employing agency which is Farm Service Agency. In contrast, 23 percent of the survey respondents worked for Cooperative Extension in these four states and 10 percent worked for Natural Resource Conservation Services while only 1 percent worked for the Extension Indian Reservation Program.

The majority of agriculture respondents (84%) reported at least some time spent annually working on reservations with the majority (29%) working once or twice per year. The next largest group (16%) worked bi-monthly on reservations followed by 14% who worked at least twice per month. In contrast, however, the majority of internet survey respondents had relatively little overall experience working on American Indian reservations. Approximately 77 percent of agriculture professionals reported they had worked on reservations with American Indian producers for less than 10 years with 30 percent of this group having worked less than one year.
Comparison of Priority Issues between American Indians and Agricultural Professionals

In comparing overall priority issues that affect quality of life on reservations, Figure 1 illustrates the mean scores assigned by American Indians alongside agriculture professional ratings for that same item. The top priority as perceived by American Indians is to improve the quality of K-12 education (4.39) (as compared with 3.75 score for agriculture professionals). This was followed by American Indians’ concerns about invasive weed control on reservations (4.31) (agriculture professionals assigned a score of 3.9). The third priority issue was to preserve cultural and historic resources (4.16) which nearly tied with agriculture professionals for this same item (4.15). Number four overall priority issue for American Indians was to increase use of NRCS programs (3.97) (compared with a score of 3.23 for agriculture professionals), followed by improve access to higher education on reservations (3.92) (compared with a score of 3.53 for agriculture professionals).

In contrast, Figure 2 illustrates agriculture professionals’ perceived top five overall priorities to improve quality of life on reservations. The top priority for this group was to conserve cultural and historic resources on reservations (4.15) which nearly tied with American Indians’ rating for this same item (4.16) yet was rated third overall. Agriculture professionals’ second highest priority was to conserve natural resources on reservations (3.92) (compared with American Indian rating of 3.85 and was not among the top 5 issues). The third priority was invasive weed control (3.90) which was rated second by American Indians (4.31). The two groups differed in the fourth and fifth priorities, however. Agriculture professionals rated the fourth highest overall issue to create long-term economic development strategies on reservations (3.90) (compared with American Indians score of 3.77) while the fifth ranked issue was to encourage overall economic growth on reservations (3.87) as compared with 3.62 score assigned by American Indians.

Figure 1. American Indian quality of life priorities compared with agriculture professional means scores for same item.
With regards to agriculture and land use issues on reservations, American Indians rated invasive weed control as the number one priority issue (4.31) while the second priority issue was to increase use of NRCS programs on reservations (3.97). American Indians scores were nearly tied in their ratings for third and fourth priority issues. They rated as third water quality management on reservation farms (3.87) and as fourth the cost of farm equipment (3.86). American Indians rated as fifth the availability of loans to American Indians to expand and/or develop farms on reservations.

Similar to American Indians, agriculture professionals also rated invasive weed control as the top agriculture and land use issue on reservations (3.90). In contrast to American Indians, however, professionals’ second through fourth rated priority issues differed from those of American Indians. The second issue as perceived by professionals was riparian area management (3.71), as compared with a score of 3.63 by American Indians for the same item. The third priority issue for professionals was to create sustainable agriculture plans for reservations (3.68). American Indians also rated this item high (3.81) but it did not score in their top five priorities. Professionals rated as a fourth priority issue conflict existing among tribal government officials (3.67) as compared with a score of 3.41 assigned by American Indians for this same item. Finally, professionals rate as fifth, water quality management on reservations (3.66) in contrast to American Indians who rated this item as third (3.87) in their top five priority rankings.
Figure 3. Top 5 American Indian agriculture issues compared with professional mean scores for same item

Figure 4. Top 5 Professional Agriculture Issues Compared with American Indian Mean Scores for Same Items.
Education Importance, Implications, and Application

The preliminary research results presented here provide the basis for further examination of perceptual differences between American Indians and agriculture professionals charged with working on reservations. Specifically, more advanced statistical tests, such as paired t-tests, will be conducted to determine if the perceptual differences that exist between the two groups are statistically significant.

Additional statistical analysis may involve specification of regression models to isolate demographic variables that may influence perception of quality of life issues. For American Indian respondents, these may include age, education, income, marital status and years lived on reservations. For agriculture professionals, these may include agency affiliation, years worked on reservations and time spent annually working on reservations.

The applied research conducted will assist in the development of an educational curriculum for agriculture professionals in order to enhance their capacity to work more effectively with American Indian producers on reservations. This curriculum will identify successful strategies that aim specifically to increase the rate of adoption of sustainable practices on reservation lands.

A primary component of this curriculum will teach agriculture professionals the importance of the influential role(s) that the local tribal political structure plays within Indian tribes and natural resource management decisions. Further, an overview of the public policies that led to the creation and existence of Indian reservations will be featured. In particular, the curriculum will consider the impacts of the General Allotment Act of 1887 which may shed useful light on the current complexity of American Indian land ownership and thus, natural resource management decision-making. This combination of primary and secondary data analysis may serve to identify key elements of successful and unsuccessful sustainable agriculture programs on Indian reservations in the four selected states.

The educational importance of this research and resulting professional development program will serve to address the knowledge gap that currently exists and prohibits agriculture professionals from working as effectively as possible on Indian lands. Intended outcomes include: 1) Increased agriculture professionals’ knowledge and appreciation of the social, political, and economic environments on Indian reservations relevant to developing sustainable agriculture educational programs on Indian lands; 2) Strengthened and increased sustainable agriculture programming and practices with American Indian producers in the four selected states; and 3) Increased participation of tribal or American Indian agriculture producers in sustainable agriculture practices.

The goal is to produce a self-paced curriculum. Program impact measures will be designed as pre-tests and post-tests to gage immediate knowledge gains or short-term impacts. This research-based educational program may be duplicated in other states pending additional funding and support.

References


