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Non-market Valuation Biases Due to Aboriginal Cultural Characteristics in Northern Saskatchewan: The Values Structures Component

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Preface

Many of the conflicts apparent in natural resource management can be characterized as conflicts of culture and values between persons of European origin and those who are Aboriginal. As one response to these conflicts, researchers have been trying to develop a better understanding of how values differ between cultures. This paper is one of a series of three studies investigating techniques for investigating cultural differences in values of forest resources.

The research in this series has been undertaken by an interdisciplinary team comprised primarily of economists and sociologists. Insights were also drawn form anthropological and psychological literature. The following descriptions of the three papers are intended to provide an overview of the stream of thought which the research team has followed, and to explain interrelationships between projects. In general, the flow of the project progressed in three phases: 1) reviewing and assessing theory; 2) addressing ethnographical information needs and; 3) investigating the potential for non-market valuation techniques.

The first paper:"In search of forest resource values of Aboriginal Peoples: The applicability of non-market valuation techniques", begins by developing a conceptual framework for assessing interrelationships between values and natural resources. Relationships between held values (i.e. ethical beliefs that individuals or groups hold) and assigned values (i.e. the relative value of things) are contextualized within socio-cultural and natural environments. It is hypothesized that assigned values are influenced by held values, thus creating the need to assess held values across cultures if assigned values are to be compared between Aboriginal and non-aboriginal peoples. The paper goes on to consider whether non-market valuation techniques, developed largely within Euro-American society, may fail to reflect accurately values of Aboriginal Peoples. Problems of valuation that were identified include: eliciting values from individuals; aggregating individual values into measures of social welfare; and comparisons of welfare across culturally different groups. The influence of sacred or taboo goods, the potential for satiation, and variations in property rights are factors to address in assessing assigned values. Differences in political and property rights systems, and unique demographic structures are seen as limits to aggregating values. Since valuation is endogenous to specific social environments, aggregations of Aboriginal and non-aboriginal measures of social welfare may be inappropriate. Adjustments to current valuation techniques are suggested to address these issues.

Having identified the potential importance of held values in influencing assigned values, the second stage of this project attempted to gather information on the held values of Aboriginal and non-aboriginal peoples. Two Aboriginal bands, one in Northern Saskatchewan and one in Northern Alberta, and one non-aboriginal community in Northern Saskatchewan were surveyed using the Rokeach Value Survey. Results indicated that although some held values differ significantly among groups, differences do not seem to be split along Aboriginal and non-aboriginal lines. Results also indicated significant differences in held values with respect to gender, but little distinction with respect to age. It is hypothesized that the similarities in held values of these different communities may be explained by a "northern community effect" which may obscure differences between Euro-American and Aboriginal cultural characteristics.

The results of the second phase were then used in the third study which was designed to investigate the potential for using contingent valuation techniques to elicit values of Aboriginal Peoples. In particular, highest ranked values in the held values study, specifically health and family security, were blended into the response options for several of the non-market valuation questions. Further, the gender differences in held values made the research team more attentive to gender in the sampling process. Despite our efforts in the second stage of the research project, we were still faced with the problem of insufficient information regarding the specific values of the people in the study area regarding natural resources to address the potential problems outlined in the first stage of the project. The non-market valuation questionnaire was designed to allow for some of these unknowns. A decision tree was constructed in which different kinds of contingent valuation questions were posed, which

depended on the responses of those surveyed. Respondents were channelled towards different CVM questions depending on their preferences for decision making mechanisms (i.e. group vs. referendum) and management options (i.e. re-stocking vs restricting commercial and/or sportfishing). The non-market valuation questionnaire focussed on the trout fishery because the state of the fishery had been documented and was applicable to both Aboriginal and non-aboriginal peoples. De-briefing questions were used to provide additional information on the context of these elicited values.

Although both groups generally favoured the group decision making mechanism, there were differences with regards to preferred management options. In general, Aboriginal Peoples favoured re-stocking while non-aboriginal peoples favoured restricting commercial and/or sport fishing or the use of a combination of approaches. Responses to debriefing questions about "why" individuals chose certain responses to valuation tasks also differed between Aboriginal and non-aboriginal groups. In particular, Aboriginal Peoples stated that maintaining the trout fishery was more the responsibility of the government than the responsibility of the local residents. This may indicate a presumed property rights setting that must be considered in future valuation efforts.

The overall results of the exercise, however, suggest that non-market valuation techniques, if carefully implemented and structured, may be as effective in Aboriginal populations as they are in non-aboriginal populations. The original hypothesis we were testing was that this approach would have less reliability in an Aboriginal context. The survey research indicated that there were no significant differences in protest responses, refusals, or, for the large part, differences in reasons for accepting or rejecting trade-off amounts. Valuation results (trade-offs) could be ascertained for both Aboriginal and non-aboriginal groups using carefully structured survey designs.

Despite these findings, we hesitate to conclude that non-market valuation techniques are appropriate cross-culturally for several reasons. First, the above results are an imperfect set of indicators regarding the applicability of the techniques used. Given the time and resource constraints of this study, we were unable to address the entire list of potential issues which was generated in the first paper of this study. Second, one may speculate that the reason for this lack of difference between Aboriginal and non-aboriginal peoples' responses may be due to similarities between non-aboriginal and Aboriginal Peoples in this particular sample. Additional research will be done to examine the responses by age and /or generation to test for differences in responses over generational groups. Third, our valuation exercise was with respect to use values. The potential problems identified may be more evident in attempting to elicit passive-use values. Finally, there was a difference in mean willingness to pay amounts between Aboriginal and non-aboriginal peoples, in that Non-aboriginals were willing to pay approximately two and one half times the amounts expressed by Aboriginal Peoples. Despite indications that much of this response may be due to income differences or differences in tastes and preferences, the cultural difference in and of itself is a significant factor.

In summary, further research is necessary to ascertain the appropriateness of cross-cultural use of non-market valuation techniques. Our work suggests several potential problem areas which may be exacerbated in eliciting values from Aboriginal Peoples. However, it may be that many of these same issues are relevant in eliciting values from all peoples.

Non-market Valuation Biases Due to Aboriginal Cultural Characteristics in Northern Saskatchewan: The Values Structures Component

Current non-market valuation techniques have been developed based on assumptions about values held within the Eurocentred culture. Contentions between cultures over natural resources are hypothesized to occur because of differences in held values resulting in different values being assigned to the resources in question. This study measured the held values of an Aboriginal band in Northern Saskatchewan as the first dimension of a non-market valuation study of natural resources. These held value structures are presented noting differences by age and gender and in comparison with the local Non-Aboriginal community and another Aboriginal group in northern Alberta.

Introduction

Human values are a central consideration in all studies of culture. Held values are those basic and enduring notions that a specific mode of conduct or end state is preferable to other options. Given the centrality of held values to assigned values (Adamowicz et al, 1994), and the limited data about Aboriginal values structures, this study undertook to determine directly the held value structures of an Aboriginal band in northern Saskatchewan and to compare them with other groups. The two other groups were the adjacent Non-Aboriginal community and another Aboriginal group in northern Alberta.

Many assumptions are made about Aboriginal values. Bierhorst (1994) stresses there are many gaps in the record about Aboriginal knowledge and values. Further, he says that the problems and pitfalls in understanding environmental issues from an Aboriginal perspective are considerable, particularly given "the persistent temptation to interpret" (p3). He notes that it is necessary to recognize both the unity as well as the diversity in Aboriginal approaches to the natural environment. Therefore, this study was undertaken to determine directly the held values of Aboriginal persons of northern Saskatchewan and Alberta.

Methodology

The instrument selected for this study was the Rokeach Value Survey (see appendix). This measure developed by Rokeach (1979) has been used in many cultures and with persons ranging from 11 to 90 years of age. It was developed as a measure of a group's values rather than an assessment of individual values. The test-

retest reliability for groups is reported as ranging from .70 to .90 based on Spearman rank order correlation.

The Values Survey requires respondents to rank order two sets of 18 values. One set is means or instrumental values, those which define preferred modes of behaviour, such as *honest* and *logical*. The second set is ends or terminal values, those things that a person seeks in life, such as *an exciting life* and *freedom*. The group value structure is determined by the mean score for all respondents. Any single value score is the rank based on mean scores for the group compared to the other values in either the means or ends set.

For use in this study the Values Survey was double translated into Cree syllabics. Double translation involves one person translating into the second language, and in this case into a second set of codes, while a second person back translates into English. Any discrepancies were then discussed to ensure a reliable representation of the concept. Two sets of cards, English and Cree, were developed with one value on each card so that respondents could sort them according to their rank order preference.

The data were collected in Northern Saskatchewan by three persons, two of whom were band members who spoke Cree. In Northern Alberta, all three persons collecting data were Aboriginal, two spoke Cree. Respondents were randomly selected on the basis of household with attention to including representation by age and gender. In Saskatchewan the band members are dispersed in a number of small reserve sites, in the town of LaRonge and the northern village of Air Ronge. Not all the remote locations were included because of distance and access problems; however, members from five reserve locations are included in the study sample.

Statistical analysis was done using SPSS. In particular, to test multiple comparison differences the Bonferroni test was used. When making multiple comparisons special tests are needed to avoid calling many differences significant. The Bonferroni test adjusts the observed significance level for the F value based on the number of comparisons that are made (Norusis 1993,273). In the case of this study, when there are three comparisons, the level of significance is less than 0.05/3 or 0.016 for the difference to be significant at the 0.05 level. This more rigorous testing was done to ensure reporting of true differences.

Table I presents information about the population parameters and the study sample. The first column

outlines the population of the LaRonge Band as taken from the voting lists. Since many of the names were identified by initials, it was not possible to determine gender. In the second column labelled the sampling frame, the ideal sample for this study is defined. The third column indicates the actual sample used in this study. One area of caution in interpreting the findings of this study is related to the oldest group, ages 55 to 64 who comprise only 6.9% of the sample while in fact they are 15.2% of the population. Many older persons declined participation in this aspect of the study.

Table I Population Parameters, Sampling Frame and Study Sample for LaRonge Band

	Population		Sampling Frame		Study Sample	
Age[1]	N	%	N	%	N	%
75+	113	4.0	60	7.5		
65 - 74	135	4.8	60	7.5	15	6.9
55 - 64	178	6.4	60	7.5		
45 -54	302	10.8	80	10.0		
35 - 44	608	21.7	170	21.5	58	26.2
25 - 34	870	31.1	230	28.5	74	33.4
18 - 24[2]	594	21.2	140	17.5	75	33.5
Unknown					1	0.01
Total	2800[3]		800	28.6%	223	8%

[1] From the LaRonge Band Council records it was not possible to determine sex of band members as many were listed by initials rather than names.

[2] This information was developed from voting lists, hence this category begins with 18. Sampling included ages 14 - 17 as well.

[3] This total does not include approximately 40 people whose birthdates were not legible on the lists provided.

Findings

To provide a context for this study, respondents were asked if they were currently, or had ever been , employed in the forest products industry. Table II presents the data for the band members. More men than women had such work experience. Most of the men (63.9 %), ha d been involved in fire control, while 28.9% had logging experience and 22.9% had been involved in milling. The second contextual question involved current uses of the local forests. Table III presents these results. For both women and men, the forests are used extensively (69.5 to 74.7%) for food (hunting) and for recreation. The second most important uses of forests (21.7 to 41%) are for medicines and for spiritual/religious purposes.

Table II Employment in Forest Products Industry

Nature of Employment	Women	%	Men	%
Logging	5	4.8	24	28.9
Fire Control	3	2.9	53	63.9
Reforestation	5	4.8	20	24.1
Trucking	1	1.0	4	4.8
Milling	1	1.0	19	22.9
Line Cutting	-	-	3	3.6
Cutting Poles	-	-	4	4.8

Table III Current Uses of Local Forests - LaRonge Band

Use of Forest	Women	%	Men	%
Recreation	73	69.5	62	74.7
Religious	29	27.6	18	21.7
Food - Hunting	78	74.3	60	72.3
Medicine	43	41	32	38.6
Berry/fruit Picking	6	5.7	1	1.2
Mushroom Gathering	4	3.8	1	1.2

Tables IV and V present the rankings of the means and ends values for the band members. The highest ranked means values were *honest, loving* and *helpful*. The highest ranked ends values were *family security, health* and *a comfortable life*. Williams (1979,21) has noted that values operate as "an appreciative system", as indicators of what a group would prefer, and not necessarily as what is actually possessed. While values are assumed to make a difference in actual behaviour, they are not mere reductionist formulations of what one will choose. This observation is made as the most highly ranked values of this group, or possibly any other, are not always a description of the current reality.

Early work reported by Rokeach (1973,72-77) reflects the expectation that there will be value differences as a function of age. He had concluded, using analysis of variance, that there were several generational gaps in values based on a process of value change which occurs in the development process. Given the social history of many Aboriginal groups, especially their dislocation from family and community through the residential school system and other assimilation efforts of Canadian policy, and the significant life style changes which have occurred in the past 40 to 50 years, there was an expectation of generational value differences for this group.

Tables VI and VII present the ranking of values by age for this study. Differences were determined by the use of analysis of variance, using the Bonferroni test for determining the significance of F values. There were no significant differences among the age groups in the case of the means values. There were only four differences in the ends values. The youngest group (14-24) differed from all other groups on their ranking of a *comfortable life* and a *sense of accomplishment*. The oldest group ranked *salvation* higher and *freedom* lower than all other groups.

It is difficult to compare these findings to earlier studies of age differences in values, principally because of the refinement of the statistical procedures. Simple analysis of variance reflects artificial differences as the number of comparisons is not accounted for. This methodological progress notwithstanding, it would appear that there are relatively few differences in value structure in this community as a function of age.

Table IV Ranking of Means Values, LaRonge Band (N=223)

Value	Mean Score	Rank
Ambitious	8.44	7
Broadminded	10.43	12
Capable	10.60	13
Clean	10.66	14
Courageous	9.77	11
Forgiving	8.07	6
Helpful	7.04	3
Honest	5.96	1
Imaginative	12.67	17
Independent	8.73	8
Intellectual	12.29	16
Logical	12.99	18
Loving	7.01	2
Loyal	7.77	5
Obedient	11.78	15
Polite	9.61	10
Responsible	7.20	4
Self-controlled	9.87	9

Table V Ranking of End Values, LaRonge Band (N=223)

Value	Mean Score	Rank
A comfortable life	7.91	3
An exciting life	10.89	11
A sense of accomplishment	10.98	12
A world at peace	7.89	4
A world of beauty	8.46	9
Equality	9.92	10
Family security	4.84	1
Freedom	8.20	6
Health	6.01	2
Inner harmony	11.10	14
Mature love	12.00	16
National security	12.64	18
Pleasure	11.04	13
Salvation	12.49	17
Self-respect	8.06	5
Social recognition	11.81	15
True friendship	8.38	8
Wisdom	8.30	7

Table VI Ranking of Means Values by Age, LaRonge Band [4]

Value	14-24	Rank	25-34	Rank	35-54	Rank	55+	Rank
Ambitious	8.79	8	8.16	6	8.41	7	9.13	10
Broadminded	10.97	13	10.19	11	9.91	11	11.13	14
Capable	11.20	14	10.42	13	10.41	13	10.33	12
Clean	9.81	11	10.61	14	12.17	17	9.20	11
Courageous	10.21	12	9.72	9	9.88	10	7.13	3.5
Forgiving	7.52	5	8.35	7	8.47	8	7.67	8
Helpful	7.13	4	6.95	3	6.98	2	7.40	7
Honest	5.67	1	6.61	1	5.28	1	6.67	2
Imaginative	13.40	17	11.53	15	12.72	18	14.73	18
Independent	8.77	7	8.74	8	7.97	5	11.53	15
Intellectual	12.76	16	12.27	17	11.41	14	13.87	16
Logical	13.72	18	12.68	18	11.93	15	14.67	17
Loving	6.07	2	7.15	4	8.14	6	6.13	1
Loyal	7.53	6	8.05	5	7.83	3	7.13	3.5
Obedient	11.87	15	11.92	16	12.16	16	9.07	9
Polite	9.23	9	9.99	10	10.03	12	7.27	5.5
Responsible	6.77	3	6.78	2	7.93	4	7.27	5.5
Self-controlled	9.57	10	10.26	12	9.36	9	10.67	13

[4]Tables VI and VII are based on n=75 for ages 14-24, n=73 for ages 25-34, n=58 for ages 35-54 and n=15 for ages 55+.

Table VII Ranking of Ends Values by Age, LaRonge Band

Value	14-24	Rank	25-34	Rank	35-54	Rank	55+	Rank
A comfortable life	8.16	5*	7.05	3	8.48	9	8.53	8
An exciting life	10.41	11	10.58	13	12.28	16	9.20	9
A sense of accomplishment	11.88	15.5*	9.86	11	10.93	12	12.33	17
A world at peace	6.89	3	8.95	7	8.22	6	6.33	3
A world of beauty	8.55	8	9.01	8	8.38	8	5.60	1
Equality	9.95	10	9.74	10	9.83	10	11.67	14.5
Family security	5.05	1	5.19	1	3.91	1	5.73	2
Freedom	7.96	6	7.64	5	8.34	7	11.47	12.5*
Health	5.80	2	6.35	2	5.47	2	6.93	4
Inner harmony	12.24	17	10.63	14	9.97	11	11.67	14.5
Mature love	11.61	13	11.85	16	12.09	15	14.53	18
National security	11.65	14	13.68	17	12.79	18	12.07	16
Pleasure	11.32	12	10.34	12	11.90	13	10.27	11
Salvation	12.49	18	13.71	18	12.03	14	7.67	5*
Self-respect	8.52	7	7.24	4	8.16	5	9.73	10
Social recognition	11.88	15.5	11.24	15	12.59	17	11.47	12.5
True friendship	7.67	4	9.47	9	7.91	4	8.20	7
Wisdom	9.03	9	8.11	6	7.55	3	7.80	6

* 0.05 level of significance

Another consideration in value structures is gender. Tables VIII and IX present the ranking of values by women and men. Women and men differ on eight means values and on six ends values. These differences are most pronounced for *broadminded, a world at peace* and *national security*. Since there are pronounced gender differences in the socialization process and the assigned roles for women and men, these differences are not unexpected. Rokeach (1973) had reported differences by gender for 8 means values and 12 ends values. These findings suggest there is the need to determine if women and men also have different assigned values for natural resources and therefore different preferences for their use. At the community level, the implication is about the nature of the decision making process, including choices about natural resources. The specific issue is whether women and men have equal access to this process and equal opportunity to have their values reflected in such decisions.

The final comparison of the value structure of this Aboriginal band was with the local Non-Aboriginal community and with another Cree band in northern Alberta. Tables X and XI present these comparisons. The differences noted are based on testing using Bonferroni formula. In particular, the band differences in the means values were *clean, intellectual* and *logical*, with all of these being of less importance than for the other two groups. The ends values differences were *a sense of accomplishment, health, inner harmony, mature love, salvation*, and *self respect.* In each of these cases these values were ranked as of lesser importance than they were by the other two groups.

A review of Tables X and XI shows that there were fewer differences between the two Aboriginal groups and the Non-Aboriginal community than might have been expected. There are just as many value differences between the two Aboriginal groups are there are with the community. With regard to these relatively few differences, especially between the Band members and the local community, the view is that another concomitant aspect of values, namely a "northern community" effect, may be operating. It is suggested that some study of held values in non-northern communities and non-northern Aboriginal bands be conducted to test this assumption.

Table VIII Ranking of Means Values by Gender, LaRonge Band

Value	Men	Rank	Women	Rank
Ambitious	7.96	5	8.81	8
Broadminded ***	8.86	8	11.67	14
Capable	10.09	12	10.99	13
Clean *	11.43	15	10.06	11
Courageous	10.10	13	9.51	10
Forgiving*	8.85	7	7.46	5
Helpful	7.17	2	6.94	4
Honest **	6.95	1	5.19	1
Imaginative **	11.84	16	13.33	17
Independent*	9.51	10	8.13	7
Intellectual **	11.33	14	13.05	16
Logical **	12.14	18	13.74	18
Loving	7.66	4	6.50	2
Loyal	8.14	6	7.47	6
Obedient	11.92	17	11.68	15
Polite	10.06	11	9.26	9
Responsible	7.56	3	6.91	3
Self-controlled	9.36	9	10.27	12

*0.05 level of significance

** 0.01 level of significance

***0.001 level of significance

Table IX Ranking of End Values by Gender, LaRonge Band

Value	Men	Rank	Women	Rank
A comfortable life	7.90	6	7.94	5
An exciting life **	9.72	11	11.80	15
A sense of accomplishment	10.44	13	11.47	12
A world at peace***	9.33	10	6.77	3
A world of beauty*	9.28	9	7.82	4
Equality*	9.22	8	10.47	10
Family security	5.30	1	4.97	1
Freedom	7.58	3	8.68	8
Health	5.97	2	6.04	2
Inner harmony	11.60	15	10.72	11
Mature love	11.50	14	12.39	18
National security***	13.90	18	11.66	13
Pleasure **	10.16	12	11.73	14
Salvation	13.22	17	11.92	16
Self-respect	7.76	5	8.30	7
Social recognition	11.61	16	11.97	17
True friendship	8.70	7	8.13	6
Wisdom	7.69	4	8.77	9

* .05 level of significance

** .01 level of significance

*** .001 level of significance

Table X Ranking of Means Values by Location [5]

	LaRonge Band		LaRonge Town		Cree Band	
Value	Mean	Rank	Mean	Rank	Mean	Rank
Ambitious	8.44	7	9.56	9	9.49	11
Broadminded	10.43	12	9.00	7	10.34	15
Capable	10.60	13	10.09	11	9.81	12
Clean	10.66*	14	10.75*	12	8.96	6
Courageous	9.77	11	9.75	10	10.28	13
Forgiving	8.07	6	9.20	8	8.77	5
Helpful	7.04	3	8.97*	6	8.59*	4
Honest	5.96*	1	4.26	1	6.79*	1
Imaginative	12.67	17	11.58	17	11.62	17
Independent	8.73	8	8.41	5	9.13	9
Intellectual	12.29*	16	10.97	14	10.32	14
Logical	12.99**	18	11.24	15	11.87	18
Loving	7.01	2	6.40	2	7.56	3
Loyal	7.77	5	7.54	4	9.31**	10
Obedient	11.78	15	14.00**	18	11.13	16
Polite	9.61	10	10.94*	13	9.01	7
Responsible	7.20	4	6.71	3	7.46	2
Self-controlled	9.87	9	11.31*	16	9.05	8

* 0.05 level of significance

** 0.01 level of significance

[5]Tables X and XI are based on n=223 for LaRonge Band, n=85 for the town of LaRonge and n=262 for the Alberta Cree Band.

Table XI Ranking of Ends Values by Location

	LaRonge Band		LaRonge Town		Cree Band	
Value	Mean	Rank	Mean	Rank	Mean	Rank
A comfortable life	7.91	3	9.37	10	8.22	5
An exciting life	10.89	11	11.45	15	10.84	14
A sense of accomplishment	10.98*	12	10.16	12	9.88	11
A world at peace	7.89	4	8.47	5	8.45	6
A world of beauty	8.46	9	10.28*	13	10.56*	13
Equality	9.92	10	9.34	9	9.29	9
Family security	4.84	1	4.83	2	7.71**	3
Freedom	8.20	6	7.02	4	7.97	4
Health	6.01*	2	4.17	1	6.59*	1
Inner harmony	11.10**	14	8.90	7	9.48	10
Mature love	12.00**	16	9.84	11	10.01	12
National security	12.64	18	13.84*	17	12.14	18
Pleasure	11.04	13	11.29	14	11.13	16
Salvation	12.49*	17	13.00*	16	11.28	17
Self-respect	8.06**	5	6.57	3	6.96	2
Social recognition	11.81	15	13.91**	18	10.89	15
True friendship	8.38	8	8.84	6	8.68	7
Wisdom	8.30	7	9.22	8	9.27	8

* group differs at .05 level of significance

** group differs at .01 level of significance

Discussions of Results with Band Members

Originally the intent had been to hold focus group discussions with a group of band members and with the Band Council. Since the number involved in the first group was 5 persons who were employees of the Band Office and the meeting arranged with the Band Council was limited in time available on the occasion of a regularly scheduled monthly meeting, the discussions that were held could not conform to the usual expectations of a focus group. However, these discussions were useful to hear some reaction to the findings and most particularly in developing Band Council support for the non-market valuation dimension of the study.

Both groups were interested in the relative lack of differences in values as a function of age. One member of the first group noted that the cultural education programs may be playing a role in this aspect of the community. These programs, though relatively new, exist both within the school system and as a supplement to it. Another band member suggested that the residential school experience though damaging, was not successful in the process of enculteration of Aboriginal persons.

With regard to differences by gender the Band Council was asked if the governance mechanisms of the band accommodated these differing points of view, particularly when only two elected Band Council members were female. The view was expressed that there are a number of women in key managerial positions and the present system allows all members to express their views. There was no further discussion of this point. Informal discussions with female band members suggest this is an area for further investigation.

In particular, the Band Council expressed the view that the findings confirmed what their view of the values of band members. They saw the use of these findings in the development of programs to address priority needs related to *health* and *family security*. All of the Band Council members participated actively in the discussion of the findings.

One of the positive outcomes of these two meetings was that, while some councillors had objected to the values aspect of this project and had not permitted the researchers to visit their areas, when the second phase or non-market valuation dimension of the study began, councillors were requesting that their communities be

included in the study. They were reasonably comfortable that the study was not merely extracting data from the Band members and that they would benefit from the findings. This sharing of data was important to confirm the nature of the findings and to develop rapport for possible future work.

Conclusion

The purpose of this aspect of this study was to define the held values of this northern Aboriginal band and to consider how age and gender affect these values. The results indicate that the values of greatest importance are *honesty*, *helpful* and *responsible* for the means values and *family security*, *health* and *a comfortable life* in the ends values. There were relatively few differences in held values as a function of age. This was not an expected finding as the literature reports several groupings of values differences by age. In the case of this group, the expectation was that the recent social history of family disruption would make age-based value differences pronounced. On the other hand, there were differences in fourteen of the thirty-six values as a function of gender. While this is not unexpected, it underlines the importance of attending to gender differences in the valuing of natural resources. Further, it suggests that if women and men have significantly different values, the mechanisms for input into the decision making process within communities must also account for the views of both women and men.

The values of this Aboriginal group were compared to the local Non-Aboriginal community members and with those of two other Cree bands from northern Alberta treated as one population. There were several differences in both means and ends values among these groups. In general, the differences for the LaRonge Band were lower rankings when compared to the other Aboriginal group and the non-Aboriginal group. This lower ranking applied even in the case of *honest* and *health* which were the top ranked values of the group. This may result from greater variance among this population than for the other two groups. However, there was not a obvious Aboriginal/Non-Aboriginal split in held values. The two Cree groups differed as much as did the LaRonge Band with the local community.

The findings of this study can be used in a number of ways. The first use was in the development of the

questionnaire for the non-market valuation dimension of this study. In particular, the highest ranked values *health* and *family security* were blended into the response options for several of the questions. Further, the gender differences in held values made the research team more attentive to gender in the sampling process for the second aspect of the study. The findings also have potential use by the Band Councils of the Aboriginal groups participating as the basis for program development.

The findings suggest that if further work were to be done to determine held values that community location should be one factor considered. While the comparison Cree bands in this study are in northern Alberta, they are not as isolated as the LaRonge group. A possible "northern community" effect should be tested.

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