



Provision of Ecosystem Services: For Communities and By Communities (Lessons from First Nations)

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Not the Same as Abstract: Sorry and Reasons

First Nations Research Project

- Two Key Objectives
- 1. To develop an understanding of economic behavior of people
- 2. To understand the role of ecosystem services (land use activities) in their wellbeing

Aboriginal People and Ecosystem Services

- ESS – Land Use Activities
- Study is rooted in Happiness/Satisfaction Literature -
- More appropriate for First Nations/Aboriginal people – Wellbeing or broader than \$ based utility
- Also various Aboriginal values – that cannot/should not be converted into \$
- Motivating factor – to develop a new technique for valuation of land use activities

Aboriginal Wellbeing

- Wellbeing of Aboriginal people – no different that people from developing or underdeveloped world
- The essential foundation of Aboriginal wellbeing – relationship with land and role of land use activities – mostly ignored in analysis, and limited to
- Material aspects such as income, consumption, unemployment and poverty

Aboriginal Wellbeing

- In the light of Aboriginal worldview – wellbeing cannot be measured by materialistic measures only
- Contributions of social, cultural, and land use activities (ESS) need to be included
- It cannot be done by objective measures – like income etc
- Subjective wellbeing: (i) effective component; and (ii) cognitive component – ex-post or retrospective assessment of the quality of life

Theoretical Model

- A Multi-Domain Model of Aboriginal Subjective Wellbeing
- Domains identified by using participatory methods – not imposed by outsiders

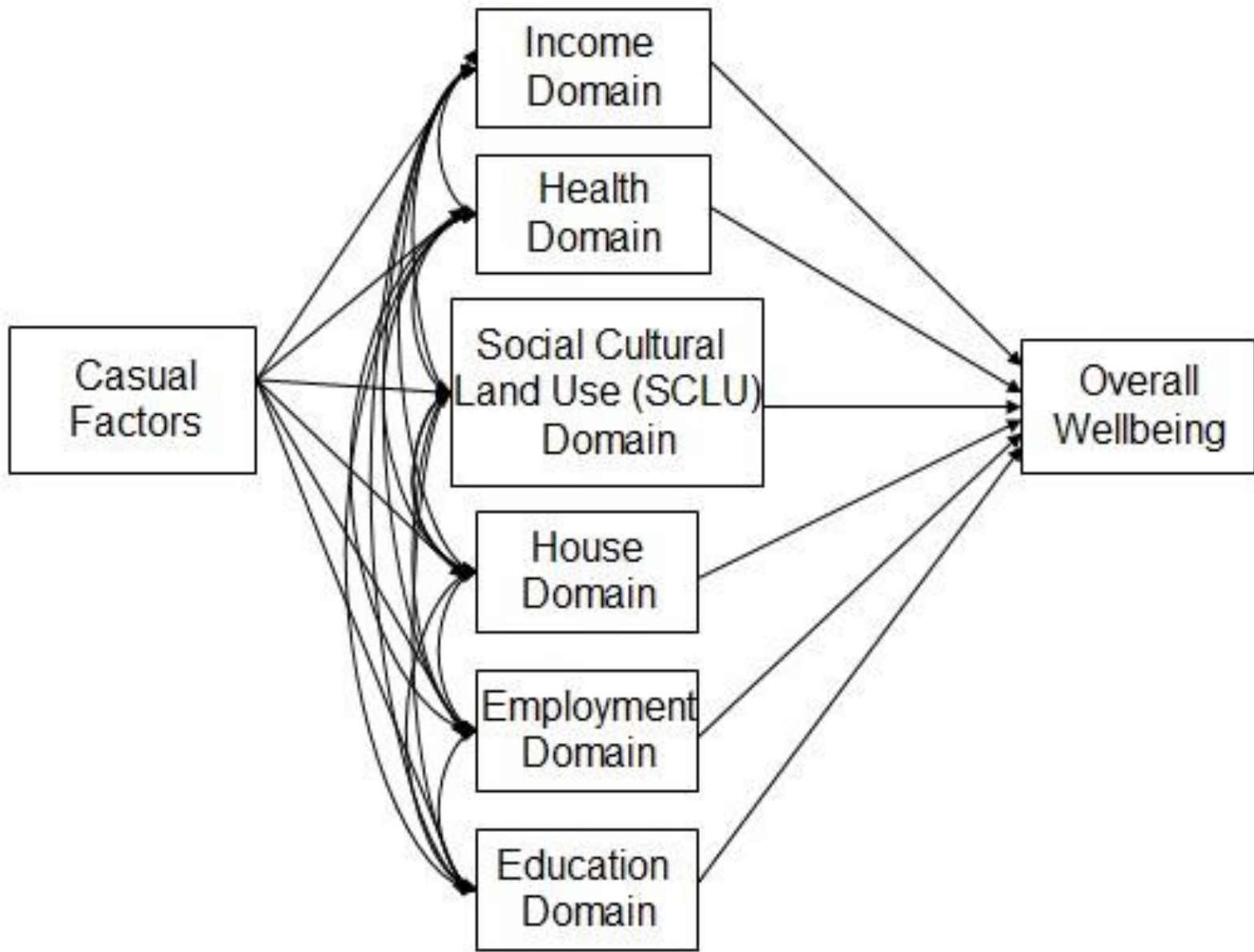


Table 1. Explanation and measurement of influencing factors

Abbreviation	Explanation and Measurement
AcceCultu	Access to First Nation cultural sites (1-4)
Age	Age of household head (years)
BreWinPay	Satisfaction with breadwinner's total pay (1-4)
BreWorkdays	Breadwinner work days per week (hours)
Ceremony	Frequency of household participation in Aboriginal cultural ceremonies (1-4)
Children	Number of children younger than 16 years in household
ChildEdu	Perception of transmission of Aboriginal traditional knowledge in children education (1-4)
Gatherhrs	Average hours per day spent on gathering (hours)
GatherQualit	Quality of time while gathering (1-4)
Gathers	Numbers of people in household that gather wild produce
ExtOrgFreq	Frequent occurrence of external organ illnesses in household (Yes/No)
HealServ	Satisfaction with government health services (1-4)
HousTitle	Ownership of house (Yes/No)
HousSpac	Satisfaction with space in house (1-4)
HousLoc	Satisfaction with the location of house (1-4)
HousMaint	Satisfaction with house maintenance (1-4)
IntOrgFreq	Frequent occurrence of internal organ illnesses in household (Yes/No)

Lawlanduse	Satisfaction with the impact of government law on household's land use activities (1-4)
LawCultu	Satisfaction with the impact of government law on household's cultural and social life (1-4)
Logbrinc	Log of breadwinner's total income
MaritalStatus	Respondent's marital status (Yes/No)
MentalFreq	Frequent occurrence of mental and psychological problems in household (Yes/No)
MentalOc	Occasional occurrence of mental and psychological problems in household (Yes/No))
SocTies	Sense of belonging to local community and social ties (1-4)
SpouUnemFull	Spouse is not full time employed (Yes/No)
SpouEdu	Education level of spouse (1-4)
Spiritual	Household freedom to participate in spiritual activities (1-4)
StateCultu	State of areas of cultural significance (1-4)
TradDiets	Percentage of typical household meal that comes from traditional diets (diets obtained from land use activities such as hunting, fishing, gathering, etc) (%)
TrapInc	The percentage of income attributable to trapping (%)
Trappers	Number of trappers in household
Traphrs	Average number of hours per day spent on trapping (Hours)
Unemplfull	Breadwinner is not full time employed (Yes/No)

* 4-point Likert scales (1 = very low, 4 = very high)



DATA COLLECTION

Data Collection

- 1. Focus groups and discussions with elders and band office people – domains and factors identification
- 2. Survey on welfare related items
- 3. Organised five games

Data Collection

- Suppose, for any given domain of life, the top of the ladder represents the highest level of satisfaction you can imagine, and the bottom represents the highest level of dissatisfaction you can imagine. Where on the ladder do you feel your household, as a whole, stood for a period of one year preceding this survey, for each of the following domains of life?

Q2. After evaluation of your satisfaction with different domains of life, where on the ladder do you rate your household's **satisfaction with life as a whole** for a period of one year preceding this survey?"

Extremely satisfied	[7]	Best possible overall satisfaction with life
Very satisfied	[6]	
Satisfied	[5]	
Moderately satisfied	[4]	
Unsatisfied	[3]	
Very unsatisfied	[2]	
Extremely unsatisfied	[1]	Worst possible overall satisfaction with life



RESULTS

Table 2. Average levels and standard deviations of Overall Wellbeing and domains' wellbeing

	Average wellbeing for all households N= 315	Average wellbeing for Ontario's people N=112	Average wellbeing for BC's people from BC N=203	Average wellbeing for females N=148	Average wellbeing for males N=167
Overall Wellbeing	5.12 (0.86)	5.30*** (0.94)	5.02*** (0.81)	5.21 (0.97)	5.11 (0.82)
SCLU Domain	4.50 (1.22)	4.62 (1.30)	4.44 (1.17)	4.24*** (1.32)	4.54*** (1.25)
Income Domain	4.57 (1.16)	4.70 (1.38)	4.49 (1.02)	4.50 (1.34)	4.68 (1.25)
Employment Domain	4.72 (1.49)	4.79 (1.82)	4.67 (1.29)	4.30* (1.88)	4.78* (1.53)
Education Domain	4.52 (1.32)	4.71* (1.67)	4.42* (1.06)	4.59 (1.64)	4.42 (1.00)
House Domain	4.61 (1.53)	5.18*** (1.66)	4.31*** (1.36)	4.61 (1.74)	4.65 (1.34)
Health Domain	5.18 (1.11)	5.32* (1.18)	5.10* (1.07)	5.28** (1.16)	5.10** (1.13)

*Note: A two-group t-test was conducted between ON and BC group, and Female and Male group. *** means 1% significance level, ** 5% significance level, and * 10% significance level.*

Table 3. Correlation matrix between different domains and generalwellbeing

	HealthDom	EmplDom	IncDom	HousDom	EduDom	SCLUDom	General wellbeing
HealthDom	1.00						
EmplDom	0.32***	1.00					
IncDom	0.28***	0.53***	1.00				
HousDom	0.22*	0.26***	0.36***	1.00			
EduDom	0.46***	0.45***	0.42***	0.41***	1.00		
SCLUDom	0.29***	0.32***	0.28***	0.21***	0.38***	1.00	
General Wellbeing	0.44***	0.43***	0.48***	0.42***	0.52***	0.48***	1.00

*Note: *** indicates 1% significance level, ** 5% significance level, and * 10% significance level.*

Overall Wellbeing

Variable	Coefficient
IncDom	0.1305***
HealthDom	0.1398***
EmplDom	0.0519**
HousDom	0.0955***
EduDom	0.0955***
SoclandDom	0.1434***
Female	0.1206*
constant	2.0232***
R-square	0.4664

SCLU Domain

Variables	Coefficient
Logbrinc	-0.1942**
HunFisQualit	0.1104*
TradDiets	0.0251***
AcceCultu	0.0951**
LawLanUs	0.2635***
SocTies	0.2228***
Neighborly	0.1781*
HousUtil	0.2797***
constant	3.6045***
R-square	0.4836

Income Domain

Variables	Coefficient
Age	0.0087**
Female	-0.2586**
Married	-0.5652***
Children	-0.1153***
Logbrinc	0.6303***
ExtOrgsev	-0.4162**
IntOrgsev	-0.4854**
HealServ	0.4935***
constant	-2.9098**
R-square	0.2161

Education Domain

Variables	Coefficient
Age	0.0121**
Married	-0.4476***
HeadSchYrs	0.0662**
SpouAbEdu	-0.4101**
ChildEdu	0.2320***
HousSpac	0.6517***
HousUtil	0.4373***
HousMaint	0.2422**
HousTitle	0.3772**
constant	0.6212
R-square	0.2966

Health Domain

Variables	Coefficient
ExtOrgsev	-0.5384***
ExtOrgoc	-0.1950**
IntOrgsev	-0.6354***
IntOrgoc	-0.2371*
Mentalsev	-1.2028***
Mentaloc	-0.2684**
HealServ	0.2653***
TrapQualit	0.3083***
TrapInc	-0.0285***
HousUtil	0.1516*
constant	4.7958***
R-square	0.2602

Housing Domain

Variable	Coefficient
Married	-0.2788*
Logbrinc	0.2996***
HousLoc	0.3717***
HousSpac	0.8671***
HousMaint	0.8854***
HousTitle	0.4580***
constant	-1.4502
R-square	0.4493

Key Findings

- The dominant role of SCLU domain or ESS as well as social and cultural services in Aboriginal Wellbeing
- The contributions of SCLU factors in other domains – provide support to Aboriginal Worldview – Holistic Approach/Systems Approach rather than the reductionist (Western Science worldview)

Key Findings

- The results explain only part of the storey – R2 not very high
- The regression models cannot capture indirect contributions or direct and indirect both together
- The SCLU Domain – contributions from land use activities/ESS are part of the system in which social, cultural, and legal aspects are also important – should not be examined in isolation

Key Findings

- Income Domain – Role of Health Problems, Healing Services
- Health Domain – Role of ESS (Trapping Quality and Trapping Income), Healing Services
- From other study – Access to Cultural sites is negatively related to Freq Mental Problem - +ve effect on Health Domain
- Freedom to participate in spiritual activities – negative to occasional mental and psychological problems

Key Findings

- Govt Law related to cultural and social life - reduces occasional occurrence of mental and psychological problems
- These findings show the contributions of ESS to Health problems which affect Income domain satisfaction

Provision of ESS

- For Individuals or Communities
- Communities are not simple addition of individuals – these are systems similar to ecosystems – social, cultural, religious attributes have functions that cannot be measured by objective measures of these attributes such as level of education, age structure etc.

Provision of ESS

- Hence, Individual-based approaches of the provision of ESS/PES may not be suitable to the provision of ESS for communities
- As shown here – strong linkages between social and cultural services and ESS, and to other domains of life
- These linkages may be different for different communities and differences between Aboriginal and non-Aboriginal communities

Key Message

- The current studies – PES etc do not address the issues related to communities
- For provision of ESS for communities – decentralized approach or community-based approach
- New understanding/methods/approaches are required – which are rooted in the concept of community