

What Matters Most in Institutional Design for Community-Based Rangeland Management in Mongolia?

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ABSTRACT

This study tested the effect of institutional design principles on social outcomes of evolving pastoral institutions in post-socialist Mongolia. Using data from 77 community-based rangeland management (CBRM) groups and 392 member households, we examined the effect of donor facilitation on institutional design. We found that donor facilitation approach significantly influenced group attributes and their external environment, but not institutional arrangements. The study confirmed that small group size, homogeneous interests, and heterogeneity of well-being are important group characteristics that predict higher levels of information diversity, leadership, and income diversity. Institutional arrangements such as the presence of sanctions, group-devised rules, frequent meetings, and recording documents increased cooperation, rules, and information diversity. Similarly, access to training and local government support provided a favorable external environment for increasing social outcomes. Furthermore, group characteristics such as dependence on livestock, homogeneity of interests, and leader legitimacy were critical for increasing social capital, livelihoods, sustainable rangeland practices, and proactive behavior of members. More frequent meetings of leaders were the most influential for these outcomes. Local government support and available donor support were associated with increased trust and norms of reciprocity, sustainable rangeland management practices, proactiveness, and livestock holdings. Lastly, group attributes and external environment influenced social outcomes of pastoral CBRMs in Mongolia more than institutional arrangements.

Keywords: commons institutions, Mongolia, institutional design, social outcomes

INTRODUCTION

Rural poverty and resource degradation have been the two major problems facing post-socialist Mongolia. The mixed results of CBRM, which was promoted to address these problems, prompted us to investigate factors influencing CBRM success. In 2007, 14 external donor programs facilitated over 2000 herder groups in Mongolia. This study

sampled groups supported by four agencies: United Nations Development Programme (UNDP), New Zealand Nature Institute (NZNI), Swiss Development Agency (SDC) and Wildlife Conservation Society (WCS). Donors named their groups differently. Groups under UNDP projects were herder groups, SDC's groups were Pasture User Groups or PUGs, and groups assisted by NZNI named themselves *nukhurluls*. The study adopted these naming conventions. NZNI and WCS applied the same facilitation strategies (WCS, 2010) thus are grouped together. The four donors had similar participatory approaches to working with herders (Leisher et al., 2012). They also engaged relevant local and national stakeholders. However, their approach to CBRM membership differed. *Nukhurluls* and herder groups had voluntary membership, where some households chose not to participate in CBRM although they shared resources in the same locality. Hence, this approach had limitations for improving rangeland condition as some resource users were not part of the rules for restraining access to resources. For this reason, SDC adopted a territory-based approach, where CBRM membership was mandatory for all households sharing the same resources (Usukh et al., 2010). The different membership approach, program focus and, possibly, other variations in facilitation may have shaped institutional designs of CBRMs. This motivated us to test the effect of group types or donor facilitation approaches on CBRM group institutional design. We addressed the following two research questions: (1) does group type or donor facilitation approach influence the institutional design of CBRMs? and (2) which institutional design elements most influence social outcomes for Mongolian pastoral groups?

STUDY SITE

We sampled 77 CBRM groups and 392 member households in four ecological zones including desert steppe, steppe, eastern steppe and mountain forest steppe zones. However, the effect of ecological zones was tested in a different study. Hence, this study excluded this variable. Our sample included 36 herder groups, 33 PUGs, and eight *nukhurluls*.

METHODS

Survey

Our data included household interviews and organization profile questionnaires. Household interviews measured household demographics, livelihoods, rangeland management practices, norms, behaviors, and social networks. The organization profile represented an initial synthesis of qualitative interview and focus group data about group characteristics, organizational management, social capital, and leadership.

Variables

In Mongolia's context of externally-driven CBRM, group type or donor facilitation approach was the primary influence on the formal organization of herders and CBRM institutional designs. Therefore, the group type was our independent categorical variable including herder groups, PUGs, and *nukhurluls*. We had three sets of institutional design variables (Agrawal, 2002): group attributes, institutional arrangements, and external environment (Table 1). Institutional design variables were dependent for ANOVA test (Table 1) but functioned as independent in multiple regressions (Table 2 and 3) influencing social outcomes.

Intermediate and ultimate social outcomes commonly measured for the performance of community-based resource institutions (Agrawal, 2002; Fernandez-Gimenez et al., 2014; Leisher et al., 2012) were dependent variables. Six intermediate outcome variables included information diversity, leadership, knowledge exchange, the presence of rules, income diversity and cooperation. Six ultimate social outcomes included essential household assets, cognitive social capital (trust and norms of reciprocity), structural

social capital (the presence social ties), rangeland practices (traditional and innovative types) and proactive behavior (members' engagement in rangeland issues).

Analysis

We used ANOVA to answer the first question about more effective facilitation type. For multiple comparisons, we used the Games-Howell procedure, the most robust for tests with unequal samples and variances like ours, to control family-wise error rates. We used multiple regressions to answer the second question. We tested the effect of institutional designs first, on intermediate outcomes, then, ultimate social outcomes.

RESULTS

Comparison of institutional designs by group types

Four group attributes varied significantly among the group types (Table 1): group size, group experience, and group diversity (members' well-being and homogeneity of interests). Institutional arrangements did not differ by group types except document records. The group types significantly differed in external environment variables including access to training, ongoing donor support, and market integration. Herder groups had significantly greater access to training and market integration than PUGs. PUGs were larger and had more donor support than herder groups.

Effect of institutional designs on intermediate social outcomes

Group attributes had significant positive effects on all intermediate outcomes while three variables had a negative influence (Table 2). Among them, group size, heterogeneity of well-being and homogeneity of interests significantly influenced three intermediate outcomes each. However, institutional arrangement variables had a limited effect: influenced rules, cooperation and information diversity. The presence of sanctions had a consistent positive effect on these outcomes. The external environment significantly influenced four intermediate outcomes including rules, information diversity, cooperation and leadership. Access to training had a strong positive effect on these outcomes.

Effect of institutional designs on ultimate social outcomes

Group attributes significantly affected all ultimate social outcomes except structural social capital (Table 3). Among them, three were most influential: dependence on livestock, homogeneity of interests, and leader legitimacy. Institutional arrangements had a significant effect on two ultimate social outcomes only: structural social capital and innovative rangeland practices. Leader meetings was the most influential variable increasing the levels of five outcomes. External environment significantly influenced four ultimate social outcomes including both types of social capital, innovative practices, and proactiveness. Local government support had a strong positive effect on these outcomes.

DISCUSSION

As we explained earlier, different group types imply different donor facilitation approaches. Regarding our first research question, we found that group attributes and their external environments were associated with donor approach. However, donor approach did not influence institutional arrangements. A prevailing dichotomy was shown between herder groups and PUGs in institutional designs. Herder group had more of the attributes theorized to promote successful outcomes in commons institutions, such as smaller group size, longer experience working together, heterogeneity of well-being, and homogenous interests of the members. Herder groups also had greater access to training and markets. In contrast, PUGs had only two positive features to group outcomes: maintaining good documentation and available external assistance.

Our study supported that small group size, homogeneous interests, and heterogeneity of well-being can predict higher levels of intermediate social outcomes. Aligning with theory, institutional arrangements such as the presence of sanctions, group-devised rules, frequent leader meetings, and recording documents increased cooperation, agreed rules, and information diversity. Access to training and local government support provided a favorable external environment for these three intermediate outcomes as well as leadership.

For ultimate social outcomes, group characteristics such as dependence on livestock, homogeneity of interests and leader's legitimacy were critical for increased social capital, livelihood and rangeland practices and proactive behavior of members. From institutional arrangement variables, leader meeting frequency was the most influential for ultimate social outcomes. Among external environment variables, local government support and ongoing donor support increased trust and norms of reciprocity, rangeland management practices, proactiveness, and herd size.

Our second research question was about institutional designs that have a positive influence on achieving greater social outcomes. We found that group attributes and external environment were more influential determinants of social outcomes than institutional arrangements. Along with these theoretically supported outcomes, we found results that contradict theoretical expectations. These included the negative effect of group size, experience and heterogeneity of well-being on knowledge exchange. Also meeting attendance and cooperation with outside agents negatively influenced the presence of rules. The quality of rules, meeting frequency, and transparency reduced the level of innovative practices while heterogeneity of well-being, dependence on livestock, and ongoing donor support were negative for social capital. We suspect that most of these negative influences may be associated with group size.

IMPLICATIONS

The design principle sets for group characteristics and external environment were shown to be applicable for predicting social outcomes of Mongolian pastoral institutions. Methodologically, two design variables including market integration and heterogeneity of endowments, needed to be contextually specific to Mongolia. Practically, the results provided a potential solution to the current disputes over the appropriate size of CBRM groups in Mongolia. The study demonstrated that for the majority of social outcomes, traditional small groups were more effective, while for cooperation and setting rules, large groups sizes were appropriate. Hence, CBRM facilitation should start from small groups eventually leading to a nested structure of CBRM.

ACKNOWLEDGEMENTS

This research was sponsored by the National Science Foundation award No. BCS-1011801, "*Does community-based rangeland management increase coupled systems' resilience to climate change in Mongolia?*"

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Table 1. Results of Comparisons of Institutional Design Variables by Group Types: Herder Groups (n=36), Pasture User Groups (PUGs, n=36) and Nukhurluls (n=8)

Institutional design variables		Sample		Herder groups ^a		PUGs ^b		Nukhurluls ^c		F	η^{2e}
		mean	range	M	SD	M	SD	M	SD		
Group attributes	Group size	89	8-482	44	32	156	100	55	47	21.32***	.38
	Group experience	5	0-14	5	3	3	2	9	4	16.07***	.30
	Leaders' legitimacy ^d	3.3	2-4	3.41	.61	3.17	.69	3.36	.63	1.26	.03
	Heterogeneity of well-being	.47	0-.73	.40	.26	.58	.10	.39	.23	6.44***	.16
	Homogeneity of interests	1.62	.5-2.0	1.75	.29	1.49	.40	1.56	.28	5.20***	.12
	Poverty level	.11	0-.94	.11	.11	.13	.16	.09	.07	.23	.01
	Dependence on livestock	.65	.18-.91	.61	.18	.70	.11	.64	.10	2.61	.07
Institutional arrangements	Ease of rules	2.57	1-3	2.68	.48	2.50	.64	2.29	.76	1.64	.05
	Awareness of rules	3.31	1-5	3.50	1.14	3.03	1.12	3.57	1.13	1.54	.04
	Group-devised rules	1.61	1-3	1.72	.81	1.44	.76	2.00	.89	1.77	.05
	Quality of rules	2.96	0-4	3.06	1.11	2.84	1.44	3.00	.63	.26	.01
	Presence of sanction	.50	0-1	.54	.51	.50	.51	.29	.49	.76	.02
	Leaders' meeting	3.18	1-8	2.80	2.03	3.76	1.92	2.71	2.14	2.05	.06
	Members' meeting	3.41	1-7	3.03	1.81	3.93	1.70	3.14	2.04	2.19	.06
	Meeting attendance	2.38	1-3	2.50	.66	2.21	.63	2.43	.79	1.51	.04
	Transparency	4.33	1-5	4.24	.74	4.42	1.12	4.43	.54	.37	.01
Documents records	8	0-15	6	4	9	4	9	3	7.60***	.18	
External environment	Access to training	1.99	0-3	2.39	.87	1.55	1.15	2.00	1.31	5.61***	.13
	Local government support	1.31	.2-2.6	1.36	.59	1.27	.53	1.28	.44	.24	.01
	External cooperation	1.38	0-3.	1.39	.73	1.38	.71	1.38	.92	0	0
	Ongoing donor support	.72	0-2	.44	.76	1.07	.79	.50	.84	5.34***	.14
	Market integration	107	20-230	82	28	137	56	93	69	11.79***	.24

^a Groups supported by the United Nations Development Programme, ^b Pasture User Groups supported by the Swiss Development Agency, ^c Groups supported by the New Zealand Nature Institute and Wildlife Conservation Society, ^d Variable was coded as follows: 1 = Not accepted at all, 2 = Little acceptance, 3 = Majority acceptance, 4 = Openly accepted. ^e Eta squared is the proportion of variation in Y that is associated with membership of the different groups defined by X (Lakens, 2013). An effect size can be small ($\eta^2=.01$), medium ($\eta^2=.06$) and large ($\eta^2=.14$) (Cohen, 1988).

*, ** and *** significant at 0.10, 0.05 and 0.01 respectively

Table 2. Results of Multiple Regressions of Institutional Design Variables on Intermediate Social Outcomes

Dependent variables	Rules	Cooperation	Information diversity	Knowledge exchange	Income diversity	Leadership
<i>Independent variables</i>						
<i>Group attributes</i>						
Group size	.38***	.21*	-.01	-.04	-.33**	.04
Group experience	.14	.18	-.13	-.45***	.24*	-.22*
Leaders' legitimacy	-.07	.23**	.11	.23**	.14	.14
Heterogeneity of well-being	.04	.25*	-.18	-.42***	.22	-.13
Homogeneity of interests	.23*	.29**	.35***	-.01	-.12	.36***
Poverty level	.25*	-.07	.17	-.02	.07	.01
Dependence on livestock	0	.15	.09	.09	-.15	.13
R^2 , and F	.22/2.26**	.30/3.40***	.21/2.20**	.29/3.39***	.24/2.59**	.23/2.48**
<i>Institutional arrangements</i>						
Ease of rules	-.07	.13	.23	.01	-.29**	.05
Awareness of rules	.08	.03	-.21	.05	-.07	-.11
Group-devised rules	-.14	-.10	.18	.19	.39**	.26*
Quality of rules	.13	-.13	-.14	-.02	-.03	-.07
Presence of sanction	.30**	.45***	.32*	-.20	.07	.03
Leaders' meeting	.20	.32*	.38*	.21	.07	.34
Members' meeting	-.15	-.16	-.40**	-.08	-.19	-.13
Meeting attendance	-.33**	.02	.08	.06	.15	-.04
Transparency	-.16	-.30*	.16	.06	-.04	.10
Documents records	.39***	.35**	.03	-.02	.06	-.03
R^2 , and F	.54/5.03***	.43/3.25***	.31/1.89*	.11/.52	.25/1.43	.17/.86
<i>External environment</i>						
Access to training	.46***	.42***	.25*	-.09	-.05	.05
Local government support	.18	.12	.18	.31**	.01	.37***
External cooperation	-.29**	-.15	.05	.12	-.09	0
Ongoing donor support	.37***	.16	.14	-.04	.06	-.08
Donor approach	.07	-.12	-.23	.08	-.32*	.05
Market integration	-.01	.11	.05	.08	.16	.19
R^2 , and F	.36/5.59***	.23/2.98**	.21/2.63**	.16/1.85	.07/.77	.20/2.45**

*, ** and *** significant at 0.10, 0.05 and 0.01 respectively

Table 3. Results of Multiple Regressions of Institutional Design Variables on Ultimate Social Outcomes

Dependent variables Independent variables	Assets	Cash income	Herd size	Social capital		Rangeland practices		Proactive behavior
				cognitive	structural	traditional	innovative	
<i>Group attributes</i>								
Group size	-.33**	.01	-.16	.12	.15	-.14	-.23*	-.10
Group experience	.15	.22	-.26**	-.05	.02	-.10	.18	-.08
Leaders' legitimacy	.15	.11	.22*	.19*	.04	.36***	.20	.32**
Heterogeneity of well-being	.04	-.06	0	-.21*	-.10	-.18	-.02	-.01
Homogeneity of interests	-.06	-.09	-.24*	.37***	.31**	-.07	.08	.24*
Poverty level	.06	-.18	-.19	-.24**	-.17	.07	.01	.05
Dependence on livestock	.33**	.25*	.33***	-.36***	.07	.26*	.28**	.21
R^2 , and F	.19/1.91*	.22/2.32**	.31/3.73***	.40/5.44***	.17/1.63	.22/2.27**	.21/2.17**	.23/2.48**
<i>Institutional arrangements</i>								
Ease of rules	.29*	.10	-.05	-.0	.06	.07	.40***	-.01
Awareness of rules	-.09	-.11	-.18	.09	.06	-.03	-.22	.06
Group-devised rules	.01	-.05	-.13	.09	.35**	.12	.23	.04
Quality of rules	-.37*	.01	-.05	.08	-.15	-.31	-.44**	-.09
Presence of sanction	.23	-.08	-.11	-.17	.08	.19	.44**	.16
Leaders' meeting	.47**	-.14	-.08	.01	.42**	.41*	.40**	.39*
Members' meeting	-.28	.21	.21	-.02	-.15	-.24	-.37**	-.43**
Meeting attendance	-.01	-.20	-.08	.30*	-.21	.01	.10	.15
Transparency	-.08	.27	.06	.26	-.02	.01	-.33**	-.07
Documents records	-.20	-.15	-.04	.04	-.01	-.03	-.13	.12
R^2 , and F	.16/.83	.18/.94	.17/.88	.22/1.22	.30/1.79*	.14/.69	.36/2.38**	.20/1.10
<i>External environment</i>								
Access to training	-.15	-.04	-.12	-.18	.26*	-.14	.05	.12
Local government support	.02	-.03	-.17	.41***	.21	.28**	.14	.36***
External cooperation	-.05	.21	.09	.01	-.04	.13	-.20*	-.03
Ongoing donor support	.15	-.04	.29**	-.13	-.23*	.14	.25*	-.05
Donor approach	-.34**	-.20	-.10	-.14	.20	-.24	-.49***	-.20
Market integration	-.18	0.22	0.04	.12	-.21	-.02	-.10	.24*
R^2 , and F	.14/1.65	.09/1.01	.13/1.44	.27/3.60*	.18/2.05*	.15/1.77	.29/4.06***	.25/3.22***

*, ** and *** significant at 0.10, 0.05 and 0.01 respectively.