

Supporting Information

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Table S1. Examples of research-action issues faced by different actors at different scales, the subsequent research conducted, and the action outcome or process lesson learned from tackling each issue

Actors	Scale of governance	Research-action issue	Research conducted	Action outcome	Process lesson
CBO-CF-PF-Rs-LPM-NPM-NGO-Priv Sec	Local to international	Low and variable herder incomes, low return of benefits from wildlife to herder households, need for new income diversification options	Hh surveys of economics and returns to different land uses in 4 sites across Maasailand	Expansion of biodiversity payment schemes, establishment of new conservancies by local Maasai and private sector	Cross-site learning visits help change behaviors and policies, cross-site information collection can change broad paradigms
CF-Rs-PF-CBO-livestock ministries-Priv Sec	Local and national	High livestock disease burden and poor livestock and health-related services	Information on efficacy and access to new vaccines and livestock breeds brought from 1 community to another, information on effects of diseases on pastoral livelihoods (hh survey)	More healthy cattle, upgraded livestock breeds, more recognition of pastoral diseases issues among policy makers	Tackle livestock / livelihood issues first, then more controversial wildlife issues
CF-CBO-Livestock ministry	Many localities to national	Poor prices for livestock products at the ranch gate	Survey of prices along market chain from producer to consumer	Improved prices at ranch gate for herders	CF can act as reliable researcher in the eyes of community members
CF-Rs-county council-livestock ministry-parastatal-NGO	Local and national	Fragmentation of land through private ownership and fences, slows movement of wildlife and livestock	Participatory mapping of fence lines, land use, livestock movement and wildlife movement (GPS collars, ground counts)	CFs make maps widely available, LPM adopt maps as basis for planning then first pastoral land-use plan adopted, but implementation difficult	Large participatory data collection empowers local voices with local and national policy makers
CF-Rs-group ranch-village-NGO-LPM	Community and county	Effects of privatization (subdivision) on people, livestock and wildlife unknown	Hh surveys and wildlife counts to assess social and ecological effects of land privatization (subdivision)	Households and communities develop new grazing associations to maintain livestock mobility	Overpowering force of urbanization makes the goal of wildlife conservation unrealistic in some areas
Rs-CF-NGO-LPM-NPM	Community, county, national	Wildlife numbers are declining over time, sometimes rapidly	Long-term trends in wildlife populations, spatial patterns of change in wildlife distribution	Recognition of wildlife loss by communities and local to national policy makers	Actors will ask for more research if it is aimed at issues they face
Rs-CF-NGO-LPM-NPM	Community, county, national	Pastoralists say wildlife are not declining, rather, wildlife are attracted to livestock	Location, number and movements of wildlife and relation to people and pastoral land use	Some park and tourism managers recognize that total removal of livestock may not always be good for wildlife	Testing hypotheses based on indigenous knowledge yield unexpected and useful results
CF-Rs-county council-Priv Sec	Community, county	Lack of effective institutions to ensure herders benefit from wildlife and wildlife losses slow down	Analysis of the causes of loss of wildlife	CF leads establishment of new conservancies and wildlife enterprises, joins others to establish new, national community policy framework	Long-term facilitation in communities allows faster and more effective change in management and policy
CF-CBO-PF-Rs	Local to international	Lack of involvement of local communities in development and implementation of local and national policy	None, Rs, CFs and PFs worked on with communities to revise both wildlife and pastoral policy documents	New wildlife policy recognizes the value of pastoral land use and new livestock policy promotes wildlife conservation	Early and ongoing involvement of local decision makers critical; continual engagement of policy makers means Rs-CF-PF team is sought after by policy makers as reliable and fair advisors

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Rs-National ministries	National to International	Global reduction in mobility of herders seems to be reducing their ability to cope with change and increasing rangeland degradation.	Synthesis of research on the effects of fragmentation on households and rangeland ecosystems in 9 sites around the globe	Change in the global paradigm about pastoralism, still in process	Cross-site information collection can change broad paradigms
Rs-CF-PF-comm-policy makers	Local to national	Lack of linkage between local and scientific knowledge, lack of use of knowledge in decision making from local to national scales	Participant observation of team meetings and interviews with researchers, community, policy facilitators, community members and policy makers	Research information is used for new management strategies and policies more often and faster than before	Strategies to deal with power asymmetries needed; creation of safe spaces helps innovation; see other lessons in body of paper
CF-CBO-PF-Rs-LPM-NPM	Local to national	Lack of integration of different sources of knowledge (local, indigenous, research, policy)	Different actors groups part of proposal development, hypothesis generation, data collection, data interpretation and communicating results of joint fact finding initiatives	Communities, researchers and policy makers now turn to each other to joint fact find on new projects; inclusion breeds empowerment; new knowledge needs to be legitimate, salient and credible; ongoing, strategic engagement and communication key; CF and PF must be central members of the research team	All actors can contribute to knowledge trading, synthesis, and generation; hybrid/cocreated knowledge is the greatest challenge but has high payoffs
All actors	Local to international	Need for broad communication of both content and process of the project to many audiences from local to international	Innovated new ways to communicate broadly	Use of radio, mass media helpful; communication and sharing of information in new fora like churches is needed; targeting and packaging of communications to coincide with policy maker "windows of opportunity"	Changing governments and poor incentives to engage and implement can be frustrating, sometimes the agenda of national policy makers does not coincide with the local issues and it becomes difficult to engage policymakers
CF-PF-Rs-International NGO's-donors-development agencies	International	Need to influence global conventional wisdom about pastoralism and rangeland dynamics	Strategy documents, plans, visions, assessments; climate change strategies; wildlife conservation strategies; poverty reduction strategies	Global discussions about pastoralism are more supportive of their lifestyle, pastoral voices more often included and heard	Multiple communication products needed; books good here; engaging journalists key; cross-site and multiple country syntheses important; cross-country information sharing critical

CBO, community-based organization; CF, community facilitator; PF, policy facilitator; Rs, researcher; LPM, local policy maker; NPM, national policy maker; Priv Sec, private sector; NGO, nongovernmental organization; hh, household; GPS, global positioning system. Local Scale, household, community, county, or district; national scale, one nation; international scale, multiple nations.