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**Herd mobility leads the way for sustainable pastoral development:
the case of Borana rangelands, southern Ethiopia¹**

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Abstract

Insights gained from experiences in pastoral development highlight mobility as the key strategy by which pastoralists exploit heterogeneous environments in space and time. Mobility is customarily organised against the background of indigenous knowledge and local decision making structures. Modern development concepts as well as government interventions have changed considerably over the past decades, but the impact on ecosystems and livelihood conditions remained small or became deteriorating. A new approach is needed, which utilises indigenous mobility concepts and institutional co-operation in natural resource management.

This paper develops concepts for the participatory planning of pastoral resource use on two sites in southern Ethiopia (Dida Hara and Web), which have been affected in different intensities by government interventions, and by a higher population density. The study was conducted from September 2000 until July 2002, in co-operation with the Borana Lowlands Pastoral Development Programme (BLPDP/GTZ). Natural resources and herd movements were mapped using PRA tools, official maps and GIS. Socio-economic characteristics of 60 households and their herd movements during and after the last drought were analysed.

Herd mobility differed between the two locations: after drought it was barely existent in Dida Hara, the location more strongly affected by development interventions, but pronounced in Web. Mobility during drought was similar at both locations, as herd movements were driven by the crisis. The socio-economic analysis determined preconditions for applying mobility at household level, specified for different stages of the drought cycle. The complementary analysis of pastoral organisations and institutions involved in controlling mobility revealed the existing local expertise and viable social structures, but also weaknesses in power structures and related conflicts. The results of final multi-stakeholder workshops affirmed that mobility was under-utilised.

A revitalisation of mobility should be attempted with the genuine involvement of the appropriate target groups and their experience. Envisaged are scenarios of rangeland

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management which operate preferably in a common property context at larger scale of the landscape. This approach integrates technical aspects of pastoral development with predictions about the household's adoption rates and viable institutional arrangements, making it more tangible and target-oriented than development concepts and policies could achieve so far.

Introduction

Herd mobility was traditionally practised by the pastoralists as the key strategy to make use of the scattered rangeland resources on a large spatial scale (Sandford, 1983). Communal resource-tenure regimes, with their customary legitimacy, were designed for extended user groups to co-ordinate and to enforce decisions over the access to shared grazing resources. The local decision making structures were flexible to allow multiple users to negotiate over the use of key resources during times of scarcity. Pastoralists' indigenous knowledge (IK) about ecology and social organisation provided the information base for rangeland management strategies appropriate to deal with the erratic rainfalls. *Vice versa*, mobility allowed to maintain and to develop the technological as well as organisational and management IK, seeking to match the needs of the herds with the available forage and water resources (Niamir Fuller and Turner, 1999).

The Borana pastoralists in southern Ethiopia developed an exceptionally efficient system of managing natural resources. The supply of permanent water was limited to clusters of deep wells in a central area. Access to water determined the utilisation of the surrounding pastures. Herds were moved between dry and rainy season pastures. Social organisation co-ordinated and enforced decisions in rangeland management among multiple resource users. Specialised on cattle husbandry, the Borana reached an outstanding level of productivity in terms of livestock and rangeland resources (Helland, 1982; Behnke and Abel, 1996).

However, research and development interventions ignored the Borana knowledge and skills in rangeland management. Interventions aimed at increasing rangeland production started in the 1970s. Construction of watering ponds in rainy season grazing areas was intended to release grazing pressure from the dry season pastures. Instead, it opened the rainy season area up for year-round grazing and attracted uncontrolled settlement. This led to reduced mobility of the herds, causing overgrazing in the formerly seasonally used pastures. At the same time, imposition of a top-down formal administration undermined the indigenous institutions of pasture management. Another destabilising factor was the political decision of the Federal Government of Ethiopia to hand over about one third of the Borana rangelands and two important well clusters to the neighbouring Somali Administrative Region. This effectively impeded access to the most fertile pastures, destroyed reciprocal arrangements between Borana and Somali pastoral communities and fuelled ethnic conflict. The extension services favoured cultivation within valuable grazing areas and blocked herd movements. The official ban on rangeland burning and the establishment of private commercial ranches exacerbated the disruption of the Borana's traditional resource-use system (Kamara *et al.*, 2004). These factors have led to a sharp decline in openly accessible Borana rangelands (Figure 1). The rapid growth of the human population (Figure 1) and recurrent droughts put further pressure on the rangelands (Helland, 2000). Already more than 40% of the area were considered as degraded in the beginning 1990s and the trend seemed further downward (Coppock, 1994).

The challenge for future pastoral development planning is to design practical concepts building on pastoralists' IK. The solution is not to romanticise this, but rather to support the proven practices and to redirect external interventions in order to support pastoralists' strategies in securing their livelihoods. Innovative approaches are needed to integrate indigenous and external knowledge in development planning and decision making. Against

this background the paper explores the core question how herd mobility can be utilised to arrive at a more sustainable pastoral development process.

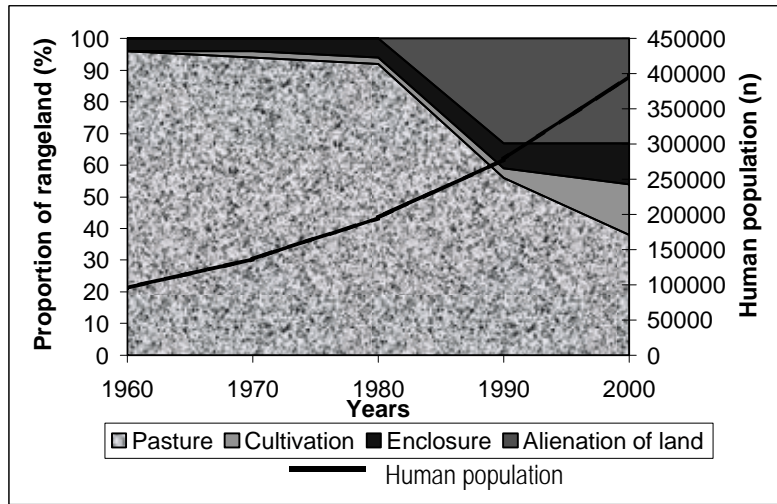


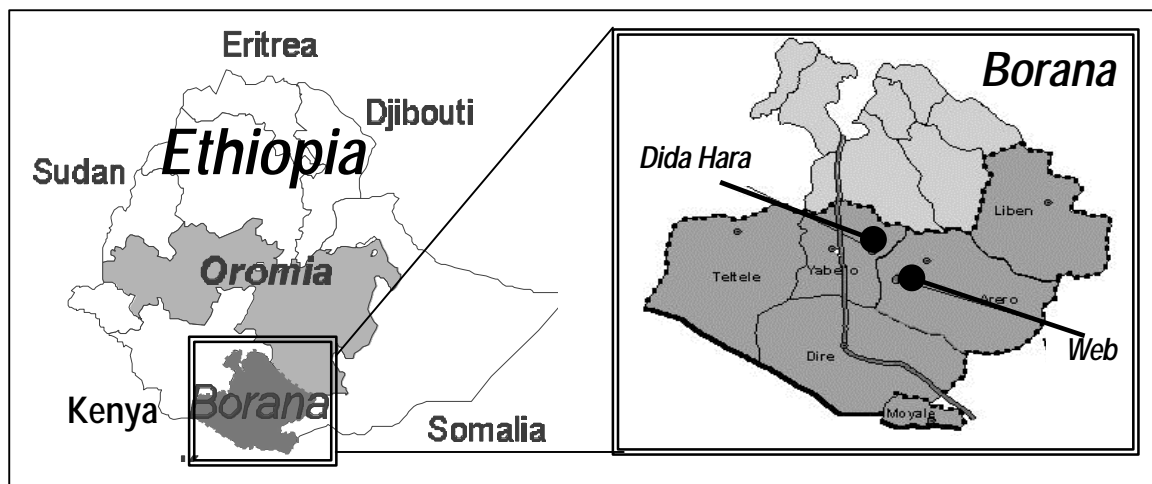
Figure 1. Projection of shrinkage of available grazing resources in Borana rangelands.

Note: The category 'pasture' represents the total remaining grazing land.

Research approach and location

The research study was planned in collaboration with the Borana Lowlands Pastoral Development Programme (BLPDP/GTZ), and was carried out from September 2000 to July 2002 (compare Homann *et al.*, 2004). Incorporated into a development project, the study was expected to improve the understanding of the pastoralists' priorities, adaptations and innovative strategies, and to contribute to more genuine development concepts for pastoral management systems.

Two districts in the Borana rangelands were chosen, which differed in functionality in the traditional system and in external interference (Map1, Map2). *Dida Hara* district was selected to represent a location with high interference from outside. The area had been traditionally used for rainy season grazing due to the only seasonally available surface water sources. The construction of permanent watering ponds in the 1970s opened up the area for year-round grazing and uncontrolled settlement. In contrast, *Web* district represented a location with comparatively lower interference. It is a traditional dry season grazing area associated with one of the deep well clusters and permanent supply of good quality water.



Map 1. Dida Hara and Web in the Borana rangelands in southern Ethiopia.

Research process and methods

To answer the core question the research process was structured as a stepwise approach focussing on mobility (Figure 2).

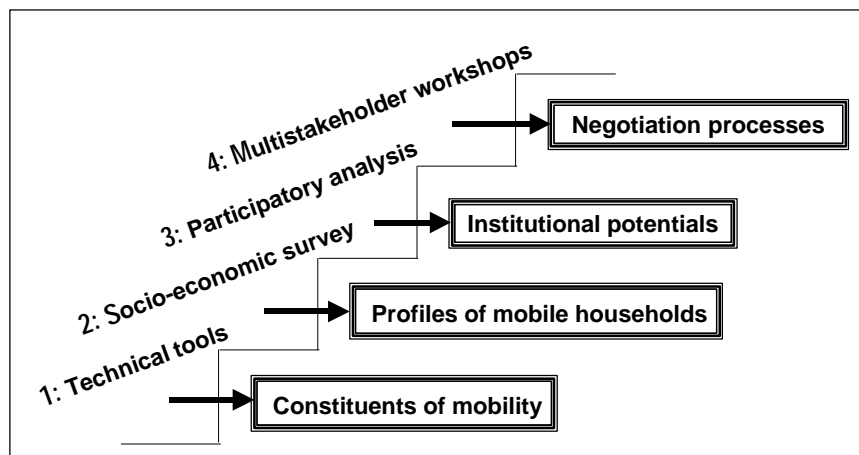


Figure 2. Stepwise approach for exploring pastoralists' IK in rangeland management strategies.

The constituents of mobility were explored starting with initial group discussions at three selected encampment clusters each in Dida Hara and Web using Participatory Rural Appraisal (PRA) techniques. On the basis of pastoralists' rangeland classification, seasonal land-use patterns in the Borana rangelands were identified, as they were practised today in comparison with 30 years ago. The current land-use patterns in Dida Hara and Web were investigated by participatory land-use mapping and herd mobility calendars. Geographic Positioning Systems (GPS) and official maps were used to quantify the pastoralists' ecological rangeland classification and assess seasonal utilisation patterns.

Profiles of mobile households were determined based on a socio-economic baseline survey in 182 and 58 households from the three encampment clusters in Dida Hara and Web, respectively. The data provided basic information about the pastoral communities and local infrastructures, as census data were not available. Subsequently a socio-economic in-depth survey was conducted with a sub-sample of 60 households. The households' herd movements during (March 1999 - February 2001) and after the last drought (March 2001 - February 2002) were recorded. A mobility index was defined by calculating the monthly walking distances of cattle, small ruminants and dromedaries. Weighing factors were applied to account for different efforts to move the different species. The aggregated distance in movements was then converted in levels of mobility (low, medium and high), determined by the mean monthly walking distances \pm 95% confidence interval and additionally integrating pastoralists' criteria for ranks of mobility (moving at least the cattle herd, and shifting the cattle herd at least twice). The effects of socio-economic household characteristics on mobility were tested by logistic regressions. Locally defined variables were hypothesised to influence the levels of mobility and were used as regressors.

The potential of the indigenous Borana institutions regulating natural resource management was analysed in participatory community meetings. Following the traditional rules, the elders in Dida Hara and Web were invited to delegate participants to the meetings, held at the traditional meeting places. The pastoralists were split into two groups and drew Venn Diagrams to show all institutions relevant for natural resource use - one group depicting the current institutions and the other depicting the situation before the development interventions. The groups jointly presented the completed Venn Diagrams and discussed the differences.

Key person interviews helped to understand the development and confirmed the findings from the group meetings.

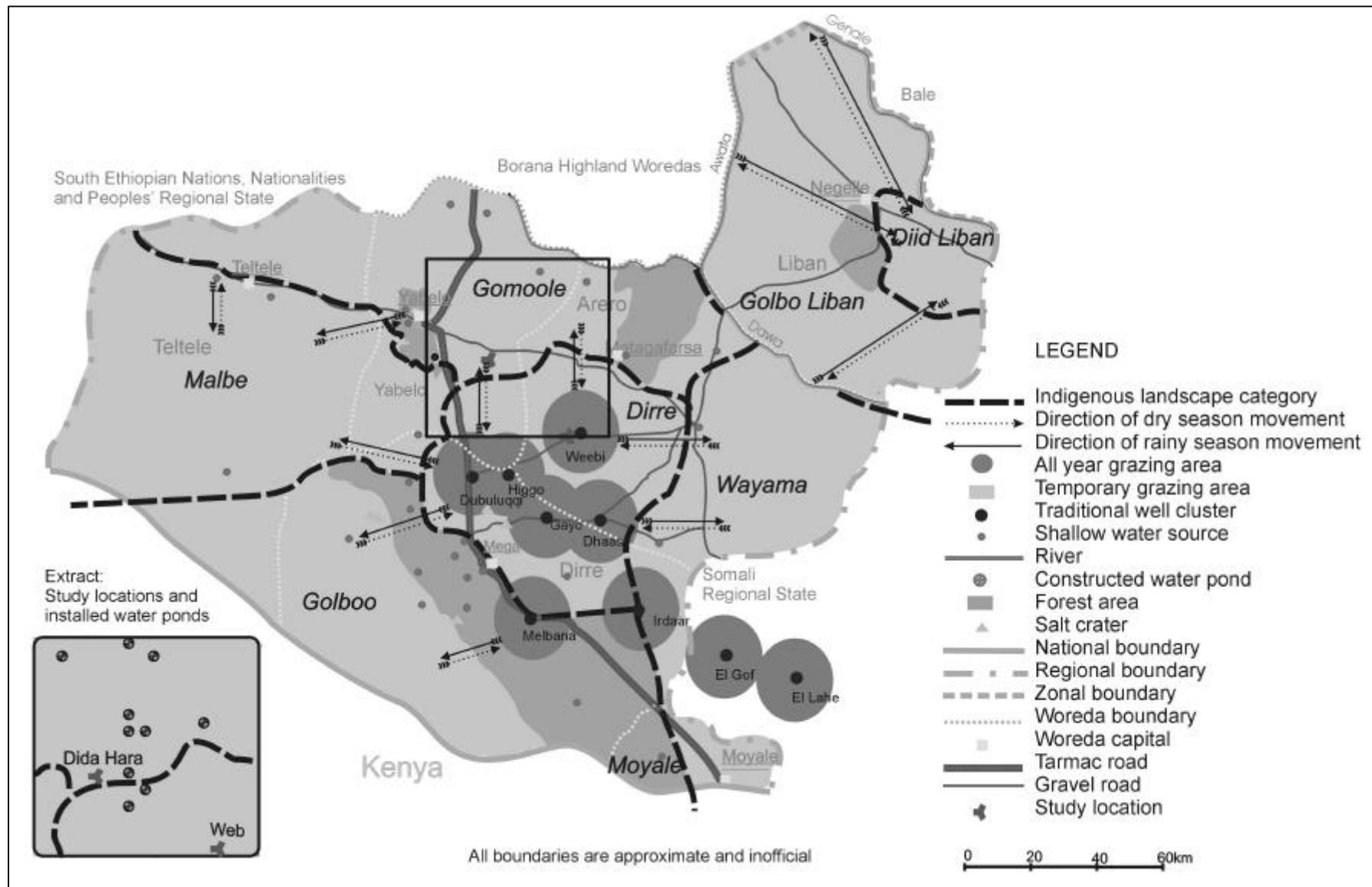
Finally, a series of multi-stakeholder workshops was organised at the end of the field research. Representatives from governmental and non governmental research and development organisations operating in the Borana rangelands as well as from the Borana pastoral communities were invited. The first workshops were held at the level of the local communities in Dida Hara and Web. The communities were invited to delegate the participants for the workshops, following the Borana customs of sending experienced elders to meetings. They were kindly asked to include women. Thereafter workshops were held at zonal-level in Negelle, capital of the Borana rangelands, at woreda-level in Yabello, seat of local development agencies, and at national level in Addis Abeba. The research findings were presented and priorities for pastoral oriented development were explored jointly.

Results

Step 1: Identifying constituents of mobile rangeland management

Herd movements have been reduced considerably over time: 30 years ago, Borana rangeland management was organised at a large scale of the landscape (Map 2). The permanent encampments were clustered near to the traditional deep wells, the only permanent source of water. During rainy seasons, the pastoralists led the herds to very distant pastures in response to rainwater availability. This reduced the grazing pressure around the wells. During dry seasons, the lack of surface water forced the herds back to the pastures around the wells. The milking herds were grazed throughout the year in the inner circle near the wells, and the other animals were kept in the outer circle. The herders - being in close contact with their herds, the natural environment and other herders - knew exactly where to move their animals in order to find available forage and water resources.

When the water dams were opened in the traditional rainy season location of Dida Hara (compare extract in Map 2), settlements expanded rapidly, as long-distance rainy season movements were no longer needed. Consequently, herd mobility was reduced, and differences emerged between Dida Hara and Web. A few wealthy Borana (6 % of the households) established very large herds of over 150 animals in Dida Hara, whereas most households (91 %) barely sustained their livelihoods from herds of less than 50 animals. One year after the last drought in southern Ethiopia, there were scarcely any herd movements in Dida Hara. Households co-operated much less in herding than in Web, and the formerly abundant pastures are rapidly degrading. Contrarily, mobility was still pronounced in Web, although the mobile herds from Web had no longer access to their former rainy season grazing areas and became confined to areas closer to the deep wells. The heterogeneity in herd size was smaller and most households continued to co-operate in managing their small herds. Generally, availability of water lost its function of regulating the spatial organisation of grazing. The Borana have almost ceased to distinguish between pastures for milking herds and pastures for more mobile herds. Separate grazing systems evolved in Dida Hara and Web, reinforced by different socio-economic trends.



Map 2. Indigenous land-use patterns in Borana rangelands, southern Ethiopia.

Source: Author, based on pastoralists' interpretation of satellite pictures provided by Werner *et al.* (2001).

Step 2: Determining socio-economic profiles of mobile households

During the drought, the mobility index was nearly similar in Dida Hara and Web, as herd movements were driven by the crisis (Figure 3). The only socio-economic characteristic, which showed an effect on mobility in both locations during drought, was that households selling their animals at export markets were more mobile than the others. However, the proportion of households with high mobility was nearly double the proportion in Dida Hara.

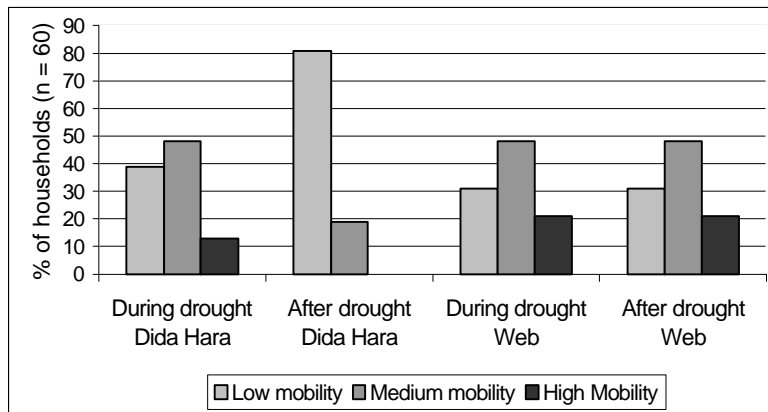


Figure 3. Proportion of Households with low, medium and high mobility in Dida Hara and Web during and after the last drought.

In the year after the drought, mobility was significantly affected by location and was higher in Web than in Dida Hara (Figure 3). No households with high mobility and only 19 % with medium mobility were found in Dida Hara, while in Web nearly half of the households exerted a medium and 21 % a high mobility. Mobility of households after the drought also increased when they were part of larger herding groups and was higher for households with enough animals to live from livestock alone. Households with camels (an adaptation in herd composition made by the Borana in response to changing rangeland conditions) were more mobile than others. More households in Web kept camels than in Dida Hara. Greater mobility was also linked to larger herd size and/or capability of organising cooperative networks. As herds are becoming smaller and family members are forced to engage in other activities, cooperation is essential to support mobility. Therefore, it is anticipated that the ongoing socio-economic differentiation and the loss of negotiating networks and information flow will lead to further reduction in mobility.

Step 3: Exploring the development and potential of indigenous institutions

The comparison of the Venn Diagrams depicting the situation before and after development interventions had taken place, showed the changes in the organisation of access to natural resources (Figure 4). Traditionally, large-scale land-use planning was co-ordinated by complex institutional networks (Figure 4a). The right of free access to water and pastures for all Borana was regulated by trusteeships for each well held by a specific clan. Appointed supervisors handled the daily administration of the wells (*abba herrega*). Water management at clan level was supported by institutions determined by grazing locality. Elders' committees co-ordinated the access of livestock to each well with the use of nearby pasture (*jarsa madda*). Further committees were responsible for the shared grazing areas (*jarsa dheedaa*). The responsibility for local land-use planning was conferred to sub-committees in the settlement clusters (*jarsa reera*), neighbourhoods (*jarsa ardaa*) and single villages (*abba olla*). Social security, including the peaceful resolution of conflicts over resource use, was assured by local clan representatives (*jallaba, abba qae*). Directives for good governance for the entire Borana society were supported by a complex administrative system (*abba gadda*)

including a legislative assembly that reviewed existing prerogatives and obligations (*gumi Gaayo*). Special counsellors were appointed as mediators within the institutional network (*hayyu*).

The governmental introduction of local administrative units - 'Peasant Associations' (*PAs*) - undermined the flexible control through experienced elders (Figure 4b). Younger community members, inexperienced in pasture management and lacking IK, were appointed and given powers of decision-making at local level. The additional transfer of authority for formal education, relief and extension to the *PAs* further undermined the authority of the traditional institutions. Today, the elders' committees are no longer able to apply their knowledge. This has caused conflicts between generations and within the communities. The committees for the large-scale coordination of herd movements have almost lost their function. Instead, immediate-response reactions are made by the village heads and formal administration. The multiple cross-linkages of the indigenous institutions for land-use planning to the indigenous institutions for social security have been almost completely destroyed. Mediation by the traditional governance body is now minimal.

Nevertheless, the Venn Diagrams show that - despite the erosion of most indigenous institutions - those concerned with administration of water (such as the deep wells in Web) have retained their importance. The essential principles of water management have been transferred to the newly constructed ponds in Dida Hara. To regain control over rangeland management, elders at both locations started to negotiate with the *PA* Committees to re-implement traditional directives for restricted settlement and thereby to stop the over-utilisation of the rangelands.

The analysis revealed weaknesses in power structures and related conflicts. Enforcement of decisions for using, maintaining and rehabilitating rangeland resources has been severely weakened. Shortage of pasture and water, as well as inter-ethnic conflicts, led to a disregard of directives. The deteriorating procedures for negotiation weakened the information and communication structures needed to co-ordinate herd movements in time and space. However, the diagrams also revealed the Borana's organisational expertise and still viable social structures. The current initiatives of the elders show that pastoralists can be innovative in adapting their strategies to changing conditions.

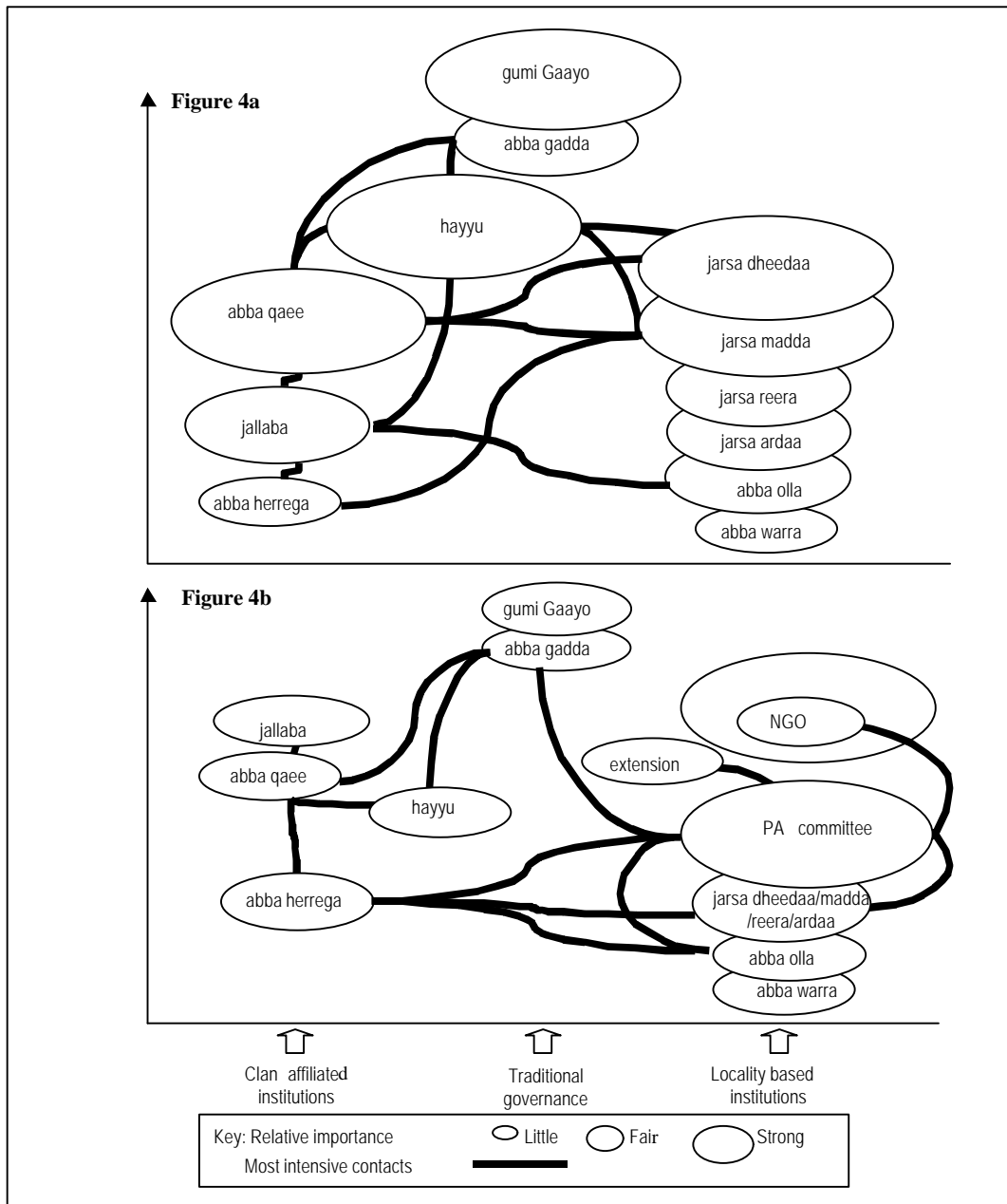


Figure 4. Simplified Venn Diagrams derived from pastoralists’ design of the most relevant institutions for natural resource management in Web and Dida Hara; 4a. Indigenous institutional set-up 30 years ago; 4b. Changed institutional set-up today.

Step 4: Initiating and encouraging multi-stakeholder platforms

The participants in the multi-stakeholder workshops affirmed that pastoral IK was still needed and under-utilised. Their statements matched with the study recommendation to focus on herd mobility in order to generate concrete options for improved rangeland management. The focus on mobility helped to define institutional responsibilities such as land-use planning at the level of local encampment clusters, grazing reserves controlled by committees of mobile herders, participatory monitoring and evaluation by genuine organs within the traditional system, and mediation among the stakeholders by sensitised pastoral representatives. The role of government is to facilitate enforcement of the decisions. Similar workshops could provide platforms for joint reflection to support ongoing efforts in participatory development planning.

Conclusions

The proposed stepwise research process focussing on herd mobility generated specific knowledge on pastoralists' rangeland-management strategies and helped to understand the current constraints to applying them. It revealed the external and internal disturbances to which Borana's IK had been exposed but also that IK persisted in some applied rangeland management strategies and negotiation networks. The three research steps preceding the final workshops allowed an informed debate mediated by development agents. These multi-stakeholder consultations could be the starting points for implementing negotiation platforms as a framework for participatory exploration of the potentials and constraints of IK-based development. Development agents should support pastoral communities in redefining their objectives and building on the persisting IK for the continuous development of pastoral IK and its application. A fundamental challenge is the implementation of a favourable pastoral policy, to assure appropriate grazing and water rights. This depends on willingness of decision-makers to learn from pastoral IK, to assure transparent information exchange and to agree upon concerted development actions.

Restructuring mobile rangeland management will not turn back the clock or overcome the fact that many Borana households depend on additional sources of income and can no longer survive from pastoralism alone. Population growth, recurrent droughts, lack of investment opportunities, and political and economic marginalisation hinder progress. However, our findings suggest that exploring pathways to support mobility and pastoral control of resource use makes development concepts more tangible and target-oriented. Backstopping mobile pastoralists for political organisation and constructive use of networks can help keep IK in action for the benefit of the rangelands and their users.

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