Strengthening Local Customary Institutions: A Case Study in Isiolo County, Northern Kenya

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By:
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About the Authors and Institutions

Daoud Tari is an International Fellow at IIED and leads the Resource Advocacy Programme (RAP), which is a community trust working on voices and governance based in Isiolo County, Kenya. As well as engaging in international and national-level advocacy work, he builds the capacity of local people and is an expert is Rapid Participatory Assessment methods.

Caroline King is a Senior Researcher working for IIED's Climate Change Group. She has spent the last decade and a half conducting and managing research and capacity building activities at the science-policy interface on global changes affecting dryland ecosystems. She has led action research in various including North and East Africa, West Asia and others.

Ibrahim Jarso works for the Resource Advocacy Programme (RAP) and is a member of the Ward Adaptation Planning Committee for Kinna Ward, Isiolo. As well as engaging in advocacy work, he builds the capacity of local people to engage with issues of resource management, participatory GIS, climate change adaptation, and pastoralism.

Resource Advocacy Programme (RAP)

RAP promotes and facilitates community access and management of the resources upon which local livelihoods depend. RAP provides a platform for dialogue and shared learning between stakeholders towards equitable outcomes.

RAP's work focuses on advocacy for supportive policies at the county and national-levels. It also supports capacity building of customary institutions at the local-level. RAP is based in Isiolo County Kenya and has been working with communities across Kenya's drylands since 2008.

National Drought Management Authority (NDMA)

The NDMA is a statutory body of the Government of Kenya. It has the mandate to establish mechanisms which ensure that drought does not result in famine, and that the impacts of climate change are sufficiently mitigated

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Acronyms

ASALs	Arid and Semi-Arid Lands
CAF	Climate Adaptation Fund
DFID	Department for International Development
IIED	International Institute for Environment and Development
ILRI	International Livestock Research Institute
KIPPRA	Kenya Institute for Public Policy Research and Analysis
NDMA	National Drought Management Authority
NRM	Natural Resource Management
RAP	Resource Advocacy Programme
GoK	Government of Kenya
RUA	Resource Users Association
StARCK+	Strengthening Adaptation and Resilience to Climate Change in Kenya plus project
WAPC	Ward Adaptation Planning Committee

Executive Summary

The benefits of adaptations to strengthen the capacities of customary institutions for natural resource stewardship to prepare for climate change, variability and drought risk were investigated through a rapid participatory assessment approach. The objective of the assessment was to weigh the benefits and costs of the investments in adaptation to short-term and long-term climate variability and change. The investments included funds made available through a devolved Climate Adaptation Fund (CAF), as well as from other sources. £66,234 was invested by Ward Adaptation Planning Committees in the wards of Kinna, Garba Tula, Sericho and Merti to build adaptive capacity to shocks and climate variability by strengthening customary institutions known in the local Boran dialect as *'Dedha'*. These CAF funds enabled the *Dedha* to review their institutional functions and procedures and to hold strategic meetings, including cross border meetings with resource users from neighbouring counties. *Dedha* members then invested their own funds to boost resource surveillance and management of the grazing areas over the long dry season May-October, 2014.

The assessment was undertaken within the same year as the investments in institutional strengthening. Amongst the benefits observed locally, economic values were estimated for pastoralists' income from livestock sales, livestock survival, health and milk production. While the benefits to the local *Dedha* from their investments in natural resource stewardship were significant, the value of benefits to pastoralists migrating into the County from the neighbouring resource insecure areas of Marsabit, Wajir and Garissa counties were even larger. Because the dry season grazing areas and drought reserves did not become overgrazed during 2014, this would also contribute to vegetation availability for 2015. Other longer term benefits would include improved ecosystem function and service provision and indirect effects on the local economy and society and wildlife. These included reduced conflict, and increased political recognition for local decision-making. The economic value of these other benefits could not readily be estimated during the rapid assessment.

The assessment confirmed that investing in adaptation to climate change at the community and ecosystem level brought rapid pay-offs, as well as building in resilience to changes anticipated over future decades. The expenditures that the *Dedha* had made on natural resource stewardship over the long dry season (May-October, 2014) were around five times the amount that they had received from the CAF. The ratio of the immediate returns to the *Dedha's* investment was around 24:1. In other words, the *Dedha* had spent around 4% of the total of annual livestock sales and dry season milk production for marketing or home consumption. In addition, despite the harsh conditions of the long dry season, livestock mortalities had been avoided.

Had a drought occurred, without the continued water and pasture availability in the drought reserves, due to the *Dedha's* management system, they estimated that up to 40-60% of their herds would have died. Therefore, the value of mortalities avoided would have increased the collective return on their investment up to as much as 90:1. Furthermore, because some members of the *Dedha* had more animals than others, in the event of a drought those who had larger than average

herds would have secured a benefit ratio of over 100:1 from their investment in natural resource stewardship through the *Dedha*. Although in 2014, the rains arrived before a full-blown drought emergency was declared, the case for the better-off members of the Dedha to continue investing more in their own institutions was clear.

Although the rapid assessment was limited by the timeframe in which it was implemented and the selection of benefits for which a market value was readily identifiable, the direct observation of immediate benefits as they were experienced by local people provided a useful indication of the sustainability of the adaptation approach. The exploration of rapid returns on investments, as well as the identification of needs for longer term assessment should help to inform the use of cost-benefit criteria in the ongoing selection of adaptation projects by the WAPCs in Isiolo, as well as in counties elsewhere in Kenya and further afield where local climate adaptation funds are being created. Reviewing and communicating the benefits may have further contributed to local recognition of the benefits and subsequent decisions by the *Dedha* members to reinvest.

We conclude that the local customary institutions secured rapid benefits to society through their adaptations. Building rapid participatory assessment processes into adaptation funds captures and can be a means to both recognize and maximize their benefits to society. Developing longer term local ecological studies to capture the full benefits would be even more beneficial. Ensuring that the full range of benefits from community- and ecosystem level adaptation are fully recognized by national governments will require adequate provisions for assessment to be included in the design of adaptation funds and programs.

Introduction

The hardest time of year for pastoralists in Isiolo, Northern Kenya, is the period at the end of the long dry season (known locally as Badess). This is the time when most available pasture has been used up, animals are weak and usually prone to diseases (e.g. pneumonia), herders are tired from migrating in search of water and digging wells, etc, and everyone is waiting for the rain. Although normally the long dry season (Adoles) lasts from around May or June to September or October, sometimes the rains are delayed, or do not come at all. During the lead-up to the long dry season of 2014, significant investments in adaptation to climatic stress were made through local customary institutions for natural resource stewardship in Isiolo County, with support from DFID and other agencies (NDMA, 2014i). A County Adaptation Fund (CAF), established on a pilot basis in the county is the first 'devolved' adaptation fund to be directed and managed at the local level, ensuring that funds are available to the vulnerable communities where they are needed.

The National Drought Management Authority (NDMA) uses a series of indicators, including rainfall, vegetation condition, water availability, livestock condition, milk production, crop production, market prices for selected commodities, household income, and nutritional status of children under five for Early Warning and drought preparedness (NDMA, 2014a). These are compared to long term averages for the time of year to classify drought warnings, differentiating between stages ranging in severity from 'Alert' to 'Alarm' and the worst case 'Emergency'. By July 2014, the neighbouring Counties of Marsabit, Garissa and Samburu were classified in the Alarm phase[1] and were reporting rapidly declining socioeconomic indicators (NDMA, 2014e, NDMA, 2014f, NDMA, 2014b). However, in Isiolo, although the rainfall conditions had been similar, the socio-economic indicators appeared to be less affected and the Alarm stage had therefore not yet been reached (NDMA, 2014c).

The County Steering Group attributed the uncharacteristic decoupling of drought and its human impacts that appeared to have happened in Isiolo to good practices in local natural resource management (NDMA, 2014j). The CAF had invested in strengthening the local institutions responsible. A rapid participatory assessment was undertaken with members of local neighbourhood institutions to assess the climate-ecosystem-economy interactions and benefits of their adaptations. The objective was to weigh the costs and benefits of the investments that had been made in adaptation. Although discussion of the costs and benefits of adaptation projects is part of the CAF project selection and decision-making process (NDMA, 2014i), this was the first time that any quantitative economic assessment was attempted for projects implemented through the CAF.

[1]. *See monthly Early Warning Bulletins for each county at: http://www.ndma.go.ke/*

Isiolo CAF investment in strengthening of local adaptation

Climate change predictions anticipate an increasing severity and frequency of extreme weather events, including droughts and floods, as well as rising temperatures across the whole of Kenya (GoK, 2013b). The extended 2008-11 drought caused livestock mortality rates as high as 40-60% in Isiolo County. The average interval of around five years between drought events is not enough to enable herd recovery from losses of this magnitude (Herrero et al., 2010). This threatens the economic future of the region because the livestock sector accounts for around 80% of all economic activity in Isiolo and surrounding Counties in Northern Kenya (GoK, 2013a).

Isiolo County is hot and dry in most months of the year, with two rainy seasons (Sombroek, 1982, GoK, 2013a). Short rains occur in October and November, while long rains arrive between March and May. The rainfall received in the County is usually scarce and unreliable, with an annual average of 580.2 mm. The wettest months are November, with an average of 143 mm of rainfall, and April, with an average of 149 mm of rainfall. High temperatures are recorded in the County throughout the year, with variations in some places due to differences in altitude. The mean annual temperature in the county is 29 degrees centigrade, with more than nine hours of sunshine per day. Strong winds blow throughout the year, peaking in the months of July and August. The total population in the County is projected to reach 191,627 by 2017, rising from 143,294 recorded during the 2009 Population Census (GoK, 2013a).

The Isiolo CAF established and supported Ward Adaptation Planning Committees (WAPCs) from rural wards to identify, develop and implement priority projects for adaptation to climate change. The one-off cost to establish the Fund in Isiolo was £455,687 (see cost breakdown in NDMA, 2014i). The budget placed at the disposal of the WAPCs for the first round of investments implemented in late 2013 and early 2014 was £355,796. By August, 2014, all activities designed by the WAPCs had been implemented and a 2nd round of adaptation investments was under development (Sharma et al., 2014).

The first round included capacity building activities in four wards (Kinna, Garba Tula, Sericho, and Merti [2]) (see locations in Figure 1), with a total combined value of £66,234. The purpose of these investments was to strengthen customary resource management institutions, known locally as *Dedha* (Tari and Pattison, 2014). These institutions enable the communities to cope with seasonal variability through the designation of areas with ephemeral water sources for grazing during the wet season, and others where there are permanent water sources to be conserved for the dry season and drought periods.

[2] *Merti Ward has since been sub-divided into two wards: Cherab and Chaari*

The capacity building activities included the preparation and facilitation of strategic processes and meetings to strengthen the functions of the customary institutions. The strategies sometimes involved the purchase of equipment to be used by teams of scouts under the supervision of the customary institutions. The strategic activities and purchases were carried out by qualified NGOs, selected and contracted by the WAPCs for this purpose.

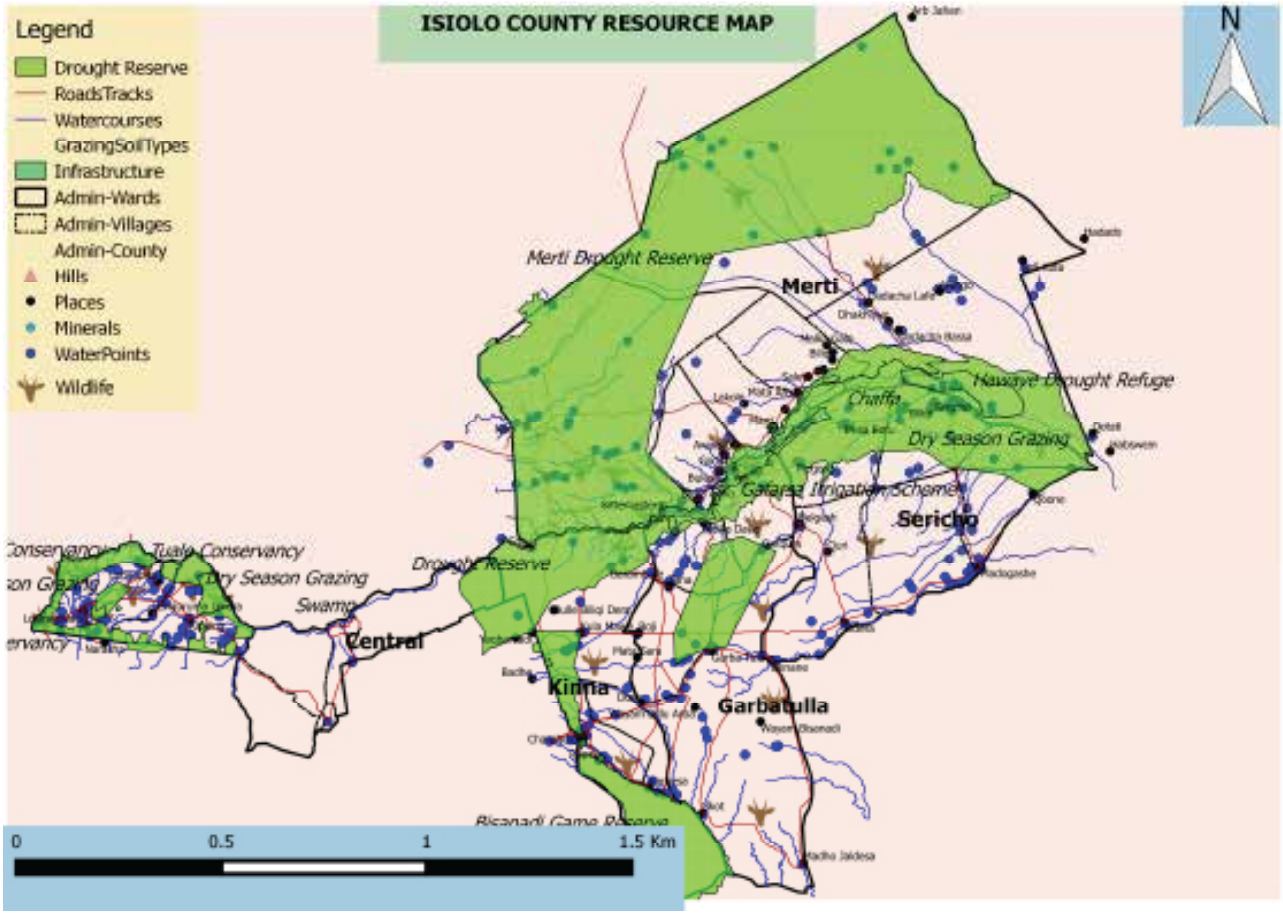

Fig 1. Location of Rural Wards of Isiolo County, Northern Kenya/ Ibrahim Jarso

Comparative context of 2014 climatic stress

In February, 2014, the County was classified under Stressed food security Phase (IPC Phase 2) (NDMA, 2014g). Water sources were depleting fast. Crops had wilted on farms before maturity and had been used as fodder for livestock. The NDMA's Early Warning Bulletins observed worsening conditions from April onward. By September, although Isiolo County had not suffered as heavily as surrounding counties the alarm was worsening, and if the rains did not arrive soon the whole region appeared to be heading for a drought emergency (NDMA, 2014d, Lekalkuli, 2014).

The most recent drought 'ended' in 2011, although its impacts were still being felt in 2014. The 2011 drought had resulted from an extended period of low rainfall, and was compounded by a range of other factors (Box 1). The economic impact of the drought was estimated to have slowed down the growth of the national economy by an average of 2.8 percent per year (PDNA, 2012). In

the month of October, 2014, the cumulative rainfall for the year was still less than it had been in 2011 in both the Northern and Southern parts of the county (Figures 2&3).

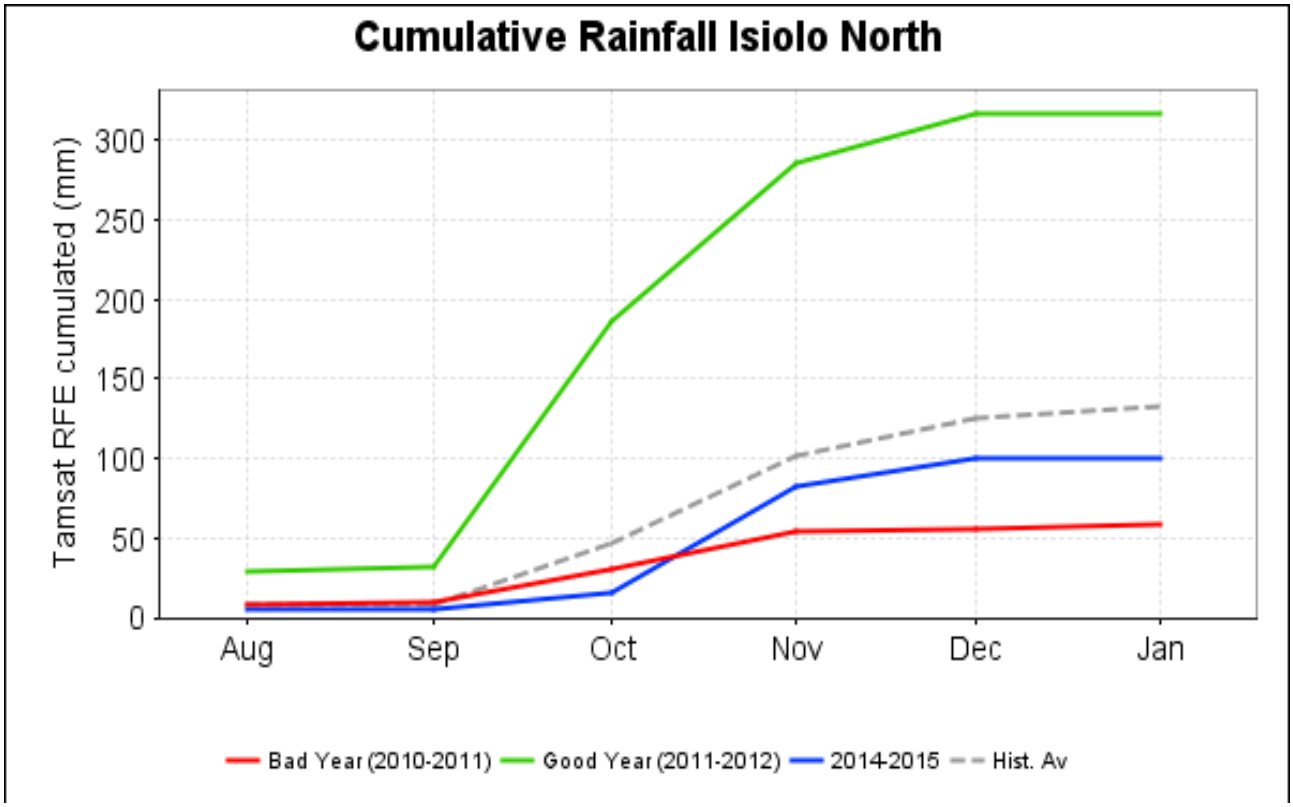

Fig 2. Cumulative Rainfall Isiolo North / Nour Godana

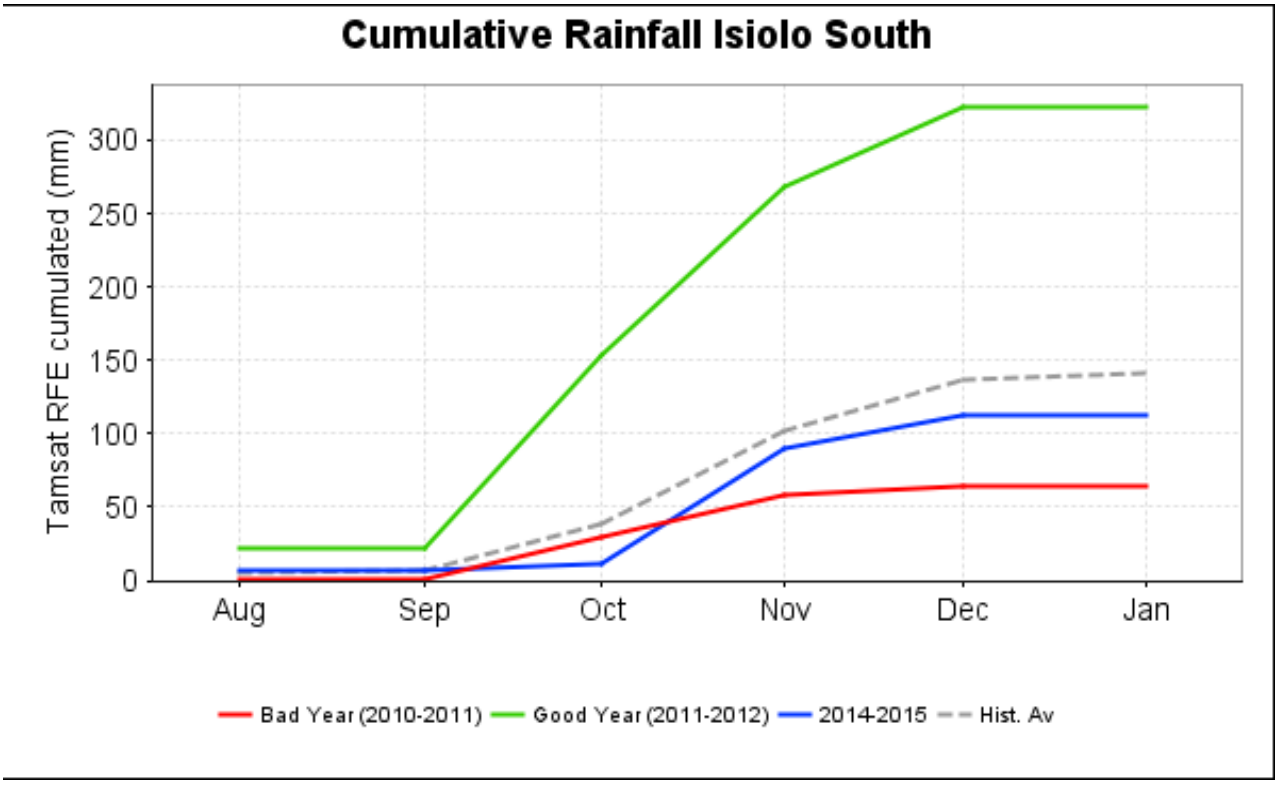

Fig 3. Cumulative Rainfall Isiolo South/ Nour Godana

The normal timing for the arrival of the short rains in Isiolo is during the second dekad of October. However, in 2014 these rains arrived only during the first dekad of November, and reduced sharply during the second dekad. Although they picked up again, by the first dekad of December they were over, when usually they should last until the third dekad of January. Both the spatial and temporal distribution of the rainfall was uneven. Sericho and Cherab (in the former Merti ward) received only 5 - 25 percent of the normal volume of rain (NDMA, 2015).

Although Isiolo escaped a full-blown drought during 2014, the five-yearly occurrence of drought events in the region would suggest that such an event is likely to occur in 2015. Had the rotational grazing systems not been well respected in 2014, pressures placed on pasture and water during the extended long dry season would have depleted the reserves of these resources for the following year.

The Assessment Challenge and Approach

Adaptation to climate change is anticipated to prevent or reduce the impacts of climate variability and changes, including accelerating and intensifying droughts. Co-benefits, including accelerated development and mitigation of future changes may also be achieved with adaptation, and should be captured in the assessment of benefits (Handmer et al., 2012). The nature and economic value of the direct and indirect effects of adaptation may be complex, context-dependent and unevenly distributed across society. Assessment of benefits may be value-laden and subjective (Chambwera et al., 2014).

Rapid assessments can be quick and dirty, and sometimes they can turn out to be biased or just wrong (Chambers, 1981, Jules Pretty, 1988). However, when they are participatory (after Chambers, 1997, Cavanna and Abkula, 2009), they offer a means to ascertain stakeholders' perspectives. This is particularly important where stakeholders are expected to implement and sustain the adaptation approach when the donor support is no longer available. A rapid assessment of the benefits from adaptation to climate variability was made at the end of the 2014 long dry season (Figure 3), when a drought was observed to be unfolding.

Participatory Assessment in Kinna facilitated by RAP/ Caroline King-Okumu

Some of the benefits from the institutional strengthening could be readily quantified and valued. *Dedha* members were able to calculate the number and value of their livestock that were grazing in the dry season grazing areas and drought reserves (Table 1).

In the event of a drought, the proportion of the herds that would have normally died, but could be saved, thanks to the availability of dry season grazing areas and drought reserves was calculated by the *Dedha* members based on their estimates of livestock mortality rates during previous droughts (Table 2). This approach is similar to a previous national level assessment of the economics of resilience, which also focused on the value of avoided livestock mortalities (Fitzgibbon, 2012).

Table 1: Estimated livestock numbers and total annual income generated by Dedha members from sales of cattle and shoats during 2014

Location	Type	Total population	Price per animal (Ksh)	Offtake rate	Income generated
Kinna	shoats	40,000	3,000	13.5	16,200,000
	cattle	20,000	40,000	15	120,000,000
Kulamawe	cattle	8,000	40,000	15	48,000,000
	shoats	100000	4000	13.5	54,000,000
Garba Tula	cattle	5,000	35,000	15	26,250,000
	shoats	45,000	4,000	13.5	24,300,000
Merti	cattle	60,000	35,000	15	315,000,000
	shoats	500,000	4,000	13.5	270,000,000
Sericho	cattle	9,000	30,000	15	40,500,000
	shoats	50,000	2,500	13.5	16,875,000
		GRAND TOTAL			**931,125,000**

Table 2: Dedha assessment of livestock mortalities avoided in the event of drought in 2014

Ward	Location	Type	Total Population	% Mortality in Drought	Number Saved in 2014	Price Kshs	Sub-Total (Kshs)
Kinaa	Kinna	Shoats	40,000	60	24,000	3,000	72,000,000
		Cattle	20,000	60	12,000	40,000	480,000,000
	Kulamawe	Cattle	8,000	65	4,800	40,000	192,000,000
		Shoats	100000	40	40000	4000	160,000,000
		Camel	6,000	10	600	80,000	48,000,000
		Donkeys	3,000	60	1,800	15,000	27,000,000
Garba Tula	Garba Tula	Cattle	5,000	50	3,000	35,000	105,000,000
		Shoats	45,000	50	22,500	4,000	90,000,000
Merti	Merti	Cattle	60,000	70	42,000	35,000	1,470,000,000
		Shoats	500,000	40	200,000	4,000	800,000,000
Sericho	Sericho	Cattle	9,000	40	3,600	30,000	108,000,000
		Shoats	50,000	40	20,000	2,500	50,000,000
				TOTAL			**3,602,000,000**

The *Dedha* members argued that without the dry season grazing areas and drought reserves, by October 2014, livestock mortality rates would have been the same as they had been during previous drought years (Table 2). However, the NDMA datasets showed that the vegetation conditions during 2014 were not as bad as they had been during 2011. This introduced doubt concerning the levels of avoided livestock mortalities estimated by the *Dedha*. Since it was not possible to verify what

level of livestock mortality would have occurred during 2014 without the *Dedha's* interventions, the research team removed the value of all avoided mortalities from the assessment of benefits achieved during 2014. This was a highly conservative approach taken by the research team which did not reflect the views and assessment of the *Dedha.*

The estimates generated through the rapid assessments with the *Dedha* were cross-checked with available literature and statistics. No annual statistics concerning livestock numbers and mortalities are routinely collected by the local authorities in the Kenyan drylands (Krätli and Swift, 2014). Livestock numbers available with the Isiolo Livestock services, which are derived from the 2009 national population census, combined with estimates for the percentage of annual population, suggest that the *Dedha* were not overestimating their herd sizes. As an alternative approach for the further verification of herd sizes at different points in time, aerial counts could be used (KIPPRA, 2011, Silvestri et al., 2013). This was not possible during the timeframe of the present study. In the meantime, the *Dedha's* own estimates based on their knowledge of their herds were considered the best available source.

Comparison of the *Dedha* members' livestock price estimates to unpublished market data collected from Isiolo market by ILRI confirmed that these were not overestimates. The *Dedhas* estimates of livestock mortalities during the 2011 drought were high compared to models used in previous national climate change assessments (Herrero et al., 2010). However, these were reconfirmed by grey literature from the drought periods (Shandey, 2014, Personal Communication).

The private income that the *Dedha* members would be able to generate from their herds during 2014 was calculated based on the prices identified by the *Dedha* and offtake rates in arid areas identified by Behnke and Muthami (2011b) see table 1. Although it is acknowledged that offtake rates for cattle in arid areas are highly variable (Fratkin et al., 1999, McCabe, 1987), an offtake rate of 15% was assumed, based on recent research (McPeak et al., 2011). For sheep and goats, offtake rates of 13.2% and 13.7%, respectively were identified (from Agriconsortium, 2003). For camels, an annual offtake rate of 1.7% was identified, but sales of camels were not included in the present assessment because this is rare in Isiolo. The offtake rates used may be considered conservative for arid conditions. All the more so for this study because some parts of Kinna ward could be considered semi-arid, implying higher rates of offtake.

Climate change effects on milk production in the ASALs and its economic value have previously been anticipated to be low (Herrero et al., 2010). However, a strong case has been made for greater consideration of this aspect of pastoralist productivity, due to its essential contribution to household food security, child nutrition and women's income generating options in the dry areas (Musinga et al., 2008, Anderson et al., 2012). Milk production is monitored at selected sentinel sites across the County by the NDMA. Normally, milk production from cattle and shoats virtually stops during the long dry season due to the reduced nutrition of the animals, and only camel milk production continues due to their comparative resilience to water stress. However, it was observed

during the *Dedha* meetings that this loss of milk production had not happened to the same extent as usual during the long dry season of 2014.

The *Dedha* meeting participants were able to identify the numbers of households benefitting from milk production during the 2014 long dry season, the volume of milk produced per household, and the market value of the milk (Table 3). Comparison of these estimates to the NDMA database and market data collected by ILRI indicated that the milk prices were not overestimated, and the dry season milk production volumes per household were underestimated. The only estimates by *Dedha* that could not be cross-checked by the research team were those concerning the numbers of households in which milk was being produced. These were notably lower than the total numbers of households in each location, the majority of which would have owned animals.

A simplified approach to the assessment of changes in milk productivity was suited to the context of the rapid participatory assessment. A more nuanced picture of seasonal milk production patterns and volumes could be obtained from the published literature (as reviewed by Behnke and Muthami, 2011a), the NDMA Early Warning Database, and more recently available Doctoral studies investigating camel milk production in Isiolo (see e.g. Elhadi, 2014, Mwaura and Wasonga, 2015).

Milk is often consumed at home, and when it is marketed this is mainly done by women. There is a tendency to underestimate the number of households and individuals benefitting from milk production, the volumes of milk concerned, and the value of the benefits that this generates. It is notable that in Garba Tula, although the *Dedha* members considered dry season milk production to be negligible, interviews held outside the *Dedha* meeting identified milk production taking place (Hildah Kathure, personal communication) and this was confirmed by the NDMA Early Warning database. Overall, the *Dedha's* estimates of effects on milk production value may therefore still be considered broadly conservative.

Table 3: Dedha estimation and valuation of milk from their herds during 2014

Location	Total number of households producing milk	Litres of milk per household per day	Total milk production July-October **	Price per litre (Ksh)	Sub-total (Ksh)
Kinna	500	3	180,000	80	14,400,000
Kulamawe	700	3	252,000	60	15,120,000
Garba Tula	(not calculated)				
Merti*	4000	5	480,000	80	38,400,000
Sericho**	100	4	12,000	40	1,080,000
	200	2.5	15,000		
			GRAND TOTAL		**67,920,000**

* only 20% of total households produce milk

** in Sericho milk production would have already stopped by June

In Kinna ward, where the temperature is more humid than other wards, animals that are weakened by lack of food and water during the long dry season become prone to diseases. This requires their owners to purchase medicines. Since this did not happen in 2014, the avoided costs of medicines for sick animals were added to the calculation of benefits from improved resource stewardship in this location.

In addition to the local herds, significant numbers of pastoralists and animals migrate into Isiolo from other Counties in search of pasture and water. The numbers of livestock entering from Garissa County in the South to Sericho, Garba Tula and Kinna wards were assessed through a meeting between pastoralists from both counties that was held as part of the institutional strengthening process in Garba Tula (RAP/IIED, 2014) (BOX 2). The numbers of pastoralists from outside the County that were using four boreholes in Merti were estimated by the Treasurer of the Resource Users Association (RUA).

For the present assessment, the value of in-migrating herds and their milk-production were calculated using the market values identified by the *Dedha* in the wards concerned, as described above. Based on the assumption that these animals would not have been able to survive in the Counties that they came from, the value of all in-migrating animals was included in the assessment, not only that of the annual offtake or anticipated drought fatalities. The volume of milk production per head of cattle, camels and shoats was based on estimates of annual milk output from literature reviewed by Behnke and Muthami (2011a). Estimates included 59 litres per head for cattle herds (based on McPeak and Doss, 2004), 186 litres per head for camel (based on Musinga et al., 2008 who estimated 34% of the total herd lactating and 547 lts/lactating camel/year) and 51.2 lit/head for shoats (based on Field, 1985 assuming 40% of flock adult female, each producing 0.351 lit/day/doe).

Because the dry season grazing areas and drought reserves did not become overgrazed during 2014, this would contribute to vegetation availability for 2015. Other benefits, including improved ecosystem function and service provision and indirect effects on the local economy and society were characterized during the *Dedha* meetings. These had also been identified and discussed qualitatively on previous occasions by the local community members through participatory resilience assessments carried out in each ward in the CAF preparation phase (ADA, 2013a, ADA, 2013b, ADA, 2013c, ADA, 2013d), project designs by the WAPCs, and a participatory monitoring and evaluation approach (Karani et al., 2014). The economic value of these other benefits could not readily be estimated in the rapid assessment.

The *Dedha* members were able to calculate approximately how much they had contributed from their own pockets to achieve the benefits from natural resource stewardship after receiving support from the CAF (Appendix). The contributions made by the *Dedha* members included

expenses for holding additional local meetings, and for transportation and other costs associated with surveillance activities carried out by local youths (Figure 4). The investments by the *Dedha* were weighed against the benefits received by the *Dedha* only. To weigh the benefits and costs of the CAF investment, CAF funds were weighed against the value of assets (animals and milk) supported in Isiolo for displaced people from the surrounding food and water insecure counties.

Assessment Findings

The members of the local customary institutions estimated that they had themselves contributed five Kenyan shillings from their own pockets for every 1 shilling that the CAF provided (Figure 4, Tables 4, 5-6 and Appendix). These contributions by the members were spent on hospitality required to hold more regular meetings, transportation and accommodation costs for local youths to make periodic monitoring visits to remote pasture and water sources. Although it is normal for the members of the customary institutions to invest in these activities, the level of investment was greater than it had been in previous years before the catalytic support through the CAF.

In most cases, the investments that the members had been making during previous years were not recorded. However, in one case (Garba Tula), the frequency of meetings had been documented in 2012 (LTS, 2013, Karani et al., 2014). Whereas only six meetings were held over the entire course of the year in 2012, during the 2014 dry season alone, nine meetings were held. The level of strategic discussion also increased, and participation was extended to neighbours from outside the Ward.

The *Dedha* members' estimates of their own investments in their customary institutions showed a large variation between wards (Figure 3 and detail in Appendix). The CAF investment in strengthening the RUA based in Merti appeared to have achieved the largest catalytic effect because the members of this association made the largest investment of their own funds. A number of factors could contribute to explaining this phenomenon. First, this association covers the largest spatial extent and includes the most animals. In addition, this association has also benefitted from previous donor support to increase capacities, enable peace-building meetings with resource users from other counties, and assess the benefits of avoided livestock mortality (Fitzgibbon, 2012).

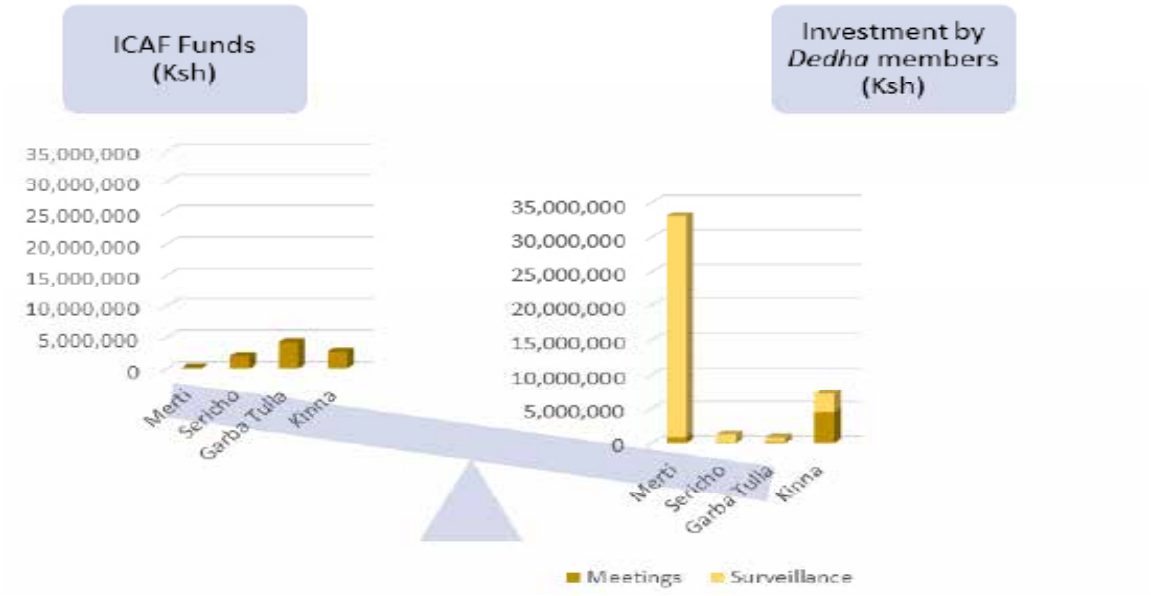

Fig 4. : Investments in strengthening customary institutions by WAPC and Dedha

While the practices of resource surveillance and *Dedha* meetings to strategize grazing practices were relatively well established and widely used in Merti (Tari and Pattison, 2014), this was not so much the case in other wards. In much of the county, the use of these practices had declined and the *Dedha* were not as well organized and accustomed to receiving and capitalizing on external support.

When the *Dedha* members compared the investments that they had made in 2014 to the value of the returns that would be secured under drought conditions, they concluded that the collective return on their investment would be almost 90:1. Because some members of the *Dedha* had more animals than others, those who had larger than average herds could obtain a benefit ratio of over 100:1 from their investments in natural resource stewardship in the event of a drought. On the other hand, once the rains had subsequently arrived, and no drought emergency had been announced by NDMA, external observers questioned the counter-factual. Income generation from livestock sales was therefore substituted for avoided livestock mortalities in the calculation of the benefits from natural resource stewardship (Table 4).

The valuation of benefits from natural resource stewardship was recognized to be only partial and did not include all of the benefits that had been identified by the *Dedha*. Nevertheless, even on the basis of the partial valuation of short-term benefits, the investment had clearly been worthwhile to the *Dedha*. The value of milk production alone already equalled the cost of the investments made in most wards. When the annual income that was gained from sales of livestock was included, the *Dedha* would already have a 24:1 ratio of returns to their investment. This made a strong case for their continued reinvestment in future years. Investing around 4% of their annual income in securing the pasture and water resources was not excessive, and would be paid back through the value of dry season milk production alone.

Table 4: Annual returns to the Dedha on their investment under non-drought conditions in 2014

Location	Dedha Expenditures			Dedha Benefit				Dedha Return on Investment (Ksh/Ksh)
	Meetings (Ksh)	Surveillance (Ksh)	Sub-total (Ksh)	Addition-al milk production (Ksh)	Avoided cost of drugs (Ksh)	Animals sold (Ksh)	Subtotal (Ksh)	
Kinna	3,390,100	613,300	4,003,400	14,400,000	8,000,000	136,200,000	158,600,000	40
Ku-lamawe	1,105,700	2,004,200	3,109,900	15,120,000	na	102,000,000	117,120,000	38
Garba Tula	253,300	536,900	790,200	na	na	50,550,000	50,550,000	64
Merti	862,200	32,184,000	33,046,200	38,400,000	na	585,000,000	623,400,000	19
Sericho	138,000	1,080,000	1,218,000	1,080,000	na	57,375,000	58,455,000	48
Subtotal	**5,749,300**	**36,418,400**	**42,167,700**	**69,000,000**	**8,000,000**	**931,125,000**	**1,008,125,000**	**24**

Table 5: Annual returns to the Dedha on their investment under drought conditions

	Dedha Expenditures			Dedha Benefit				Dedha Return on Investment (Ksh/Ksh)
	Meetings (Ksh)	Surveil-lance (Ksh)	Sub-total (Ksh)	Addition-al milk production (Ksh)	Avoided cost of drugs (Ksh)	Animals saved from death (Ksh)	Subtotal (Ksh)	
Kinna	3,390,100	613,300	4,003,400	14,400,000	8,000,000	552,000,000	574,400,000	143
Ku-lamawe	1,105,700	2,004,200	3,109,900	15,120,000	na	427,000,000	442,120,000	142
Garba - Tula	253,300	536,900	790,200	na	na	195,000,000	195,000,000	247
Merti	862,200	32,184,000	33,046,200	38,400,000	na	2,270,000,000	2,308,400,000	70
Sericho	138,000	1,080,000	1,218,000	1,080,000	na	158,000,000	159,080,000	131
Subtotal	**5,749,300**	**36,418,400**	**42,167,700**	**69,000,000**	**8,000,000**	**3,602,000,000**	**3,679,000,000**	**87**

The value of benefits to pastoralists who were not members of the local neighbourhood institutions (Tables 6 & 7) was notably larger than the value of benefits to the members of *Dedha* who had put in the initial investment. This was because the numbers of the herds entering Isiolo from outside were considered to be differently structured and far larger than those of the local communities (see Box 2).

Table 6: Estimated value of livestock entering Isiolo from outside, 2014

Ward	Type	Total population	Price per animal (Ksh)	Sub-total (Ksh)
Kinna	camels	12,000	80,000	960,000,000
	shoats	100,000	3,000	300,000,000
	cattle	1,000	40,000	40,000,000
Garbatulla	camels	15,000	80,000	1,200,000,000
	shoats	1,500,000	4,000	6,000,000,000
	cattle	200	35,000	7,000,000
Sericho	camels	12,000	80,000	960,000,000
	shoats	100,000	2,500	250,000,000
	cattle	1,000	30,000	30,000,000
Merti	camels	2,564	80,000	205,120,000
	shoats	45,880	4,000	183,520,000
	cattle	5,550	35,000	194,250,000
			GRAND TOTAL	**10,329,890,000**

Table 7: Estimated value of milk produced by livestock entering Isiolo from outside, 2014

Location	Type	Total population	Milk production (l/head/yr)	Total volume of milk	Price per litre (Ksh/l)	Total value (Ksh)
Kinna	camels	12,000	186	2,232,000	80	178,560,000
	shoats	100,000	51	5,120,000	80	409,600,000
	cattle	1,000	547	547,000	80	43,760,000
Garbatulla	camels	15,000	186	2,790,000	60	167,400,000
	shoats	1,500,000	51	76,800,000	60	4,608,000,000
	cattle	200	547	109,400	60	6,564,000
Sericho	camels	12,000	186	2,232,000	40	89,280,000
	shoats	100,000	51	5,120,000	40	204,800,000
	cattle	1,000	547	547,000	40	21,880,000
Merti	camels	2,564	186	476,904	80	38,152,320
	shoats	45,880	51	2,349,056	80	187,924,480
	cattle	5,550	547	3,035,850	80	242,868,000
		GRAND TOTAL		**95,497,400**		**6,198,788,800**

When these benefits to resource users from both outside and inside the county were considered, the ratio of the immediate countable economic benefits to the initial CAF investment was increased exponentially. The immediate return on the CAF investment reached a total of 1,822:1 (Figure 5). If the benefits were weighed against the full programme cost to DFID, including start-up costs and the entire CAF budget, the benefit ratio was still 265:1. If the value of the livestock is disregarded, and only the value of the milk that was produced to support displaced pastoralists from food insecure regions during only the six month dry season is considered, still the ratio of benefits to the investment in institutional strengthening is 342:1. If the whole program cost, including all of the other adaptation projects including infrastructure, etc, is weighed against the value of milk production alone, the benefit ratio is still 50:1.

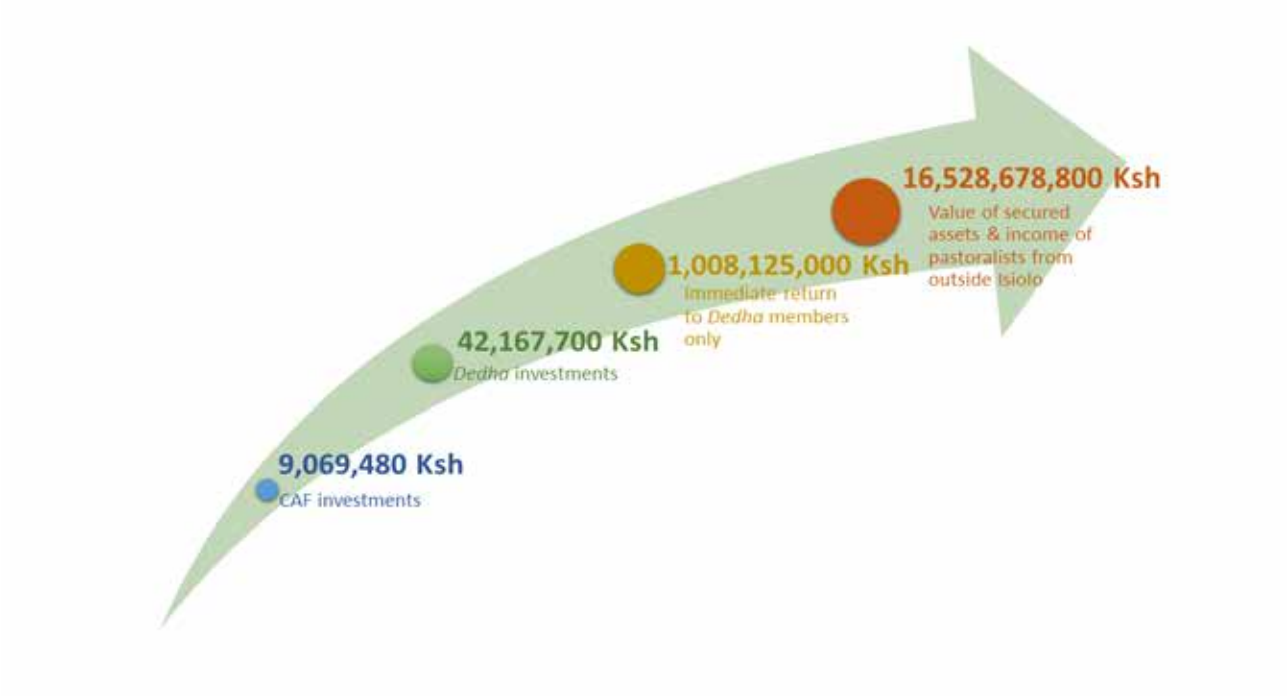

Fig. 5: Catalytic chain of investments and immediate benefits from the CAF

The characterization of other benefits from the natural resource stewardship that were beyond the scope of the economic valuation included effects on ecosystem services, as well as indirect effects on the economy and society. Effects on ecosystem services due to management of watering points and seasonal grazing patterns amongst designated areas for wet season, dry season and drought reserves included effects on groundwater use, recharge and storage volumes, vegetation distribution, volume and species composition, wildlife habitats and survival rates, seed germination and soil qualities.

No resource accounting framework is in place in the county through which the value of the ecosystem benefits could be assessed either over the six month period addressed by this study, nor into the future under anticipated climatic stresses. No baseline estimates have been established for the total value of ecosystem services in the customarily managed rangelands. Several previous studies have proposed methods that could be used for this purpose (Silvestri and Kershaw, 2010, Leeuw et al., 2012, WRMA, 2013, GEODATA, 2014). Establishment of a county-wide framework

and operationalization of these assessment methods would require a sustained action-research intervention over a period of several years, rather than a single rapid assessment.

A broad range of other effects on the economy and society were also noted during the participatory assessments. These included reduced need for migration in search of water and pasture, resulting in reduced security risks and increased time spent at home with the family and taking care of local businesses. Improved livestock quality enabled market development, better prices, increased income generation and spending on local events such as weddings, Hajj and business development. Strengthening local institutions enhanced the voice of local leaders and created employment and skill-development opportunities for the youths who were involved in resource surveillance.

These social benefits broadly reflected those that have been identified through monitoring and evaluation activities focusing on development outcomes of interest to DFID (Karani et al., 2014). In some cases (e.g. distances travelled to water and pasture), relevant information is already routinely collected by the NDMA for its Early Warning Bulletins. An ongoing discussion of the social indicators by the ward committees is anticipated to lead to the selection and refinement of a manageable set of benefits indicators that could be prioritized for economic assessment. These would focus on benefits to poor and marginalized members of the community. A generic framework which could guide the economic assessment of these benefits is available (Nicholls et al., 2014).

The participatory assessment also highlighted benefits to the county in terms of reduced needs for expenditure on emergency assistance that had resulted from sustained productivity during dry season and drought periods. Avoiding these expenditures could be expected to liberate funds for other investments in public service provision. Budgetary allocations to social assistance are published by the County government. Following the extreme circumstances of 2008-11, a one-off assessment including expenditures by all donors was made at the national level for that period only (PDNA, 2012). However, no framework is in place for regular comprehensive assessment of expenditures on emergency assistance and resilience building, including donor supported interventions.

Discussion

While exploration of effects of resilience on both milk and livestock value is an improvement on previous economic assessments of climate change adaptation in Kenya's drylands (e.g. SEI, 2009, Herrero et al., 2010), the assessment is still very selective, incomplete and underestimated. This is underlined by the long list of benefits of natural resource stewardship identified by the *Dedha* that could not be readily valued and included in the economic assessment. The assessment was limited by the timeframe in which it was implemented -within the same season as the investments in strengthening the natural resource stewardship institutions. It focused only on benefits achieved during this time, rather than over the longer term. This enabled direct observation of immediate benefits as they were experienced by local people, but was too short a timeframe to allow all benefits to take effect and be quantified. Exclusion of the benefits from avoided livestock mortality rendered the assessment even more incomplete. Nevertheless, local recognition of the benefits enabled discussion of the significance for decision-making at different levels, including their own decisions to reinvest.

It has been acknowledged that the estimates generated through the rapid assessment and used for the economic assessment, as well as the characterization of the comparison between drought cycles were imprecise and could be improved through more intensive systematic long term data collection. Some of these could be obtained through more detailed analysis of the NDMA early warning database –e.g. for refinement of the assessment of dry season milk production by different livestock species before and after the strengthening of grazing management. Others would require additional datasets to be generated. Nevertheless, the estimates used were the best available estimates, and the only ones available to the WAPCs on which to base their ongoing investment decisions. At present, the selection of CAF projects includes discussion of the relative costs and benefits anticipated from them by the WAPCs (NDMA, 2014i). However, there is no set framework for prediction of these costs and benefits, and the M&E system in place is not designed to track them.

Although decision-makers and donors are keen to identify the returns on investment through the CAF, it is important to recognize that the results from investments in strengthened customary resource stewardship institutions in Isiolo cannot be attributed to the CAF alone because many agencies have contributed to this long term process over the years. An interagency assessment could more comprehensively account for all investments in resilience building in Isiolo made since the 2008-2011 drought, and the Net Present Value of benefits achieved over a longer and more forward-looking timeframe. In the meantime, the major part of the credit for the achievement in

Isiolo, as evidenced in the NDMA statistics for July 2014, must clearly go to the *Dedha* members themselves, as well as to the WAPCs for making good use of the CAF to catalyse and accelerate the pace of their local adaptations.

Despite all of the limitations of the study, the findings point to both the cost-effectiveness of local resilience-building, and the overall effectiveness of the local customary institutions in achieving it. A more comprehensive valuation investigation carried out over a longer timeframe could be anticipated to identify a greater number and scale of benefits, rather than lesser returns, and therefore to reinforce this positive assessment. Such an assessment should take into consideration improved ecosystem function and service provision and indirect effects on the local economy. Inclusion of provisions for assessments of such benefits in the design of Adaptation Funds could be expected to reinforce and even increase their effectiveness because communities will co-finance and reinvest where they see evidence that their money was well spent.

Recommendations

- Decision-makers can expect investments in local customary institutions for community and ecosystem level adaptation to pay off rapidly at community- and ecosystem scales.

- The design of Funds for community-scale adaptation and associated assessment frameworks should anticipate, achieve and capture ecosystem-wide benefits in light of the movement of people and livestock in the dryland systems.

- The range of benefits from community-level adaptations will include some that can be immediately quantified and valued (avoided livestock mortality and increased milk production), and others (such as improved ecosystem function and service provision and indirect effects on the local economy) for which economic valuation will require work to design and operationalize an appropriate assessment framework.

- Making provisions to anticipate and assess the benefits achieved through adaptation can reinforce and even increase these benefits because communities will co-finance and reinvest where money was considered to have been well spent.

- The CAF is a good example of improved local governance. The County government, national government and donors should take ownership of it and invest in it.

Conclusions

This rapid assessment of benefits achieved through the pilot Climate Adaptation Fund for Isiolo should help to inform the design of future Adaptation Funds in Kenya and elsewhere. Although the rapid assessment was limited by the timeframe in which it was implemented it enabled direct observation of immediate benefits as they were experienced by local people. This provided a useful indication of the sustainability of the adaptation approach. The large proportion of benefits from adaptation that were enjoyed by resource users from outside the County was notable. Reviewing and communicating the benefits may have further contributed to local recognition of the benefits and subsequent decisions by the *Dedha* members to reinvest.

Investing in adaptation to climate change at the community and ecosystem level brings rapid pay-offs, as well as building in resilience to changes anticipated over future decades. The benefits of adaptation go well beyond avoiding the physical and financial costs of loss and damage associated with the changing climate. When local institutions succeed to identify, plan and achieve the adaptations that they need, natural, human and social capitals are all enhanced. Building rapid participatory assessment processes and longer term local ecological studies into adaptation funds captures and reinforces the value of these additional benefits to society.

The exploration of rapid returns on investments, as well as the identification of needs for longer term assessment may help to inform the use of cost-benefit criteria in the ongoing selection of adaptation projects by the WAPCs in Isiolo, as well as in counties elsewhere in Kenya and further afield where local climate adaptation funds are being created. Maximizing the benefits from these funds is as important as enlarging their size. Ensuring that the full range of benefits from community- and ecosystem level adaptation are fully recognized by national governments requires adequate provisions for assessment to capture them.

Box 1. What is a Drought Emergency

Droughts are complex processes involving the combination of multiple stresses that build vulnerability -often unevenly- over time and space. Drought emergencies concern not so much the quantity of rainfall as its distribution, and the lack of measures to store and manage it effectively. More fundamentally, these emergencies are a product of deeper vulnerabilities affecting people's livelihoods and well-being, the nature of which differs across the ASALs. Vulnerability to drought is recognized to be the product of inequalities in access to public goods and services (GoK, 2012 p11).

Droughts are not discrete events that strike at a given time and then disappear. Between 1975 and 2011 there were at least ten serious droughts in Northern Kenya, including most recently (2005-6, 2008-9 and 2010-11). The number of people affected by repeated drought emergencies appears to be rising. According to the inter-agency Kenya Food Security Steering Group (KFSSG) an estimated 4.5 million people were affected in 2011, 3.8 million in arid and semi-arid lands (ASALs) and 700,000 in non-ASAL areas. The extent to which the rise in these numbers is attributable to the deepening vulnerability of drought-affected populations whose assets are progressively reduced each time a drought hits them, or to the growing severity of drought conditions, is a subject of debate.

It is now recognized that 'drought evolves slowly and need not become a disaster if adequate and appropriate mitigation and resilience measures are put in place' (GoK, 2012 p9). Kenya's strategy for ending drought emergencies has two main elements:

- Strengthening people's resilience to drought.
- Improving the monitoring of, and response to, emerging drought conditions.

This strategy requires concerted action by a range of different actors, including communities, the government and its development partners.

GOK, 2012

Box 2. Findings of participatory assessment of seasonal cross border movements between Garissa and Isiolo counties

In 2014, Garba Tula WAPC used some of the funds that they had received from the CAF to host a cross-border workshop with pastoralists and officials from the neighbouring Garissa County. During the workshop, cross border movements between Garissa and Isiolo Counties were discussed and estimates for the number of households and livestock involved were generated (Figure B2).

RAP/IIED, 2014

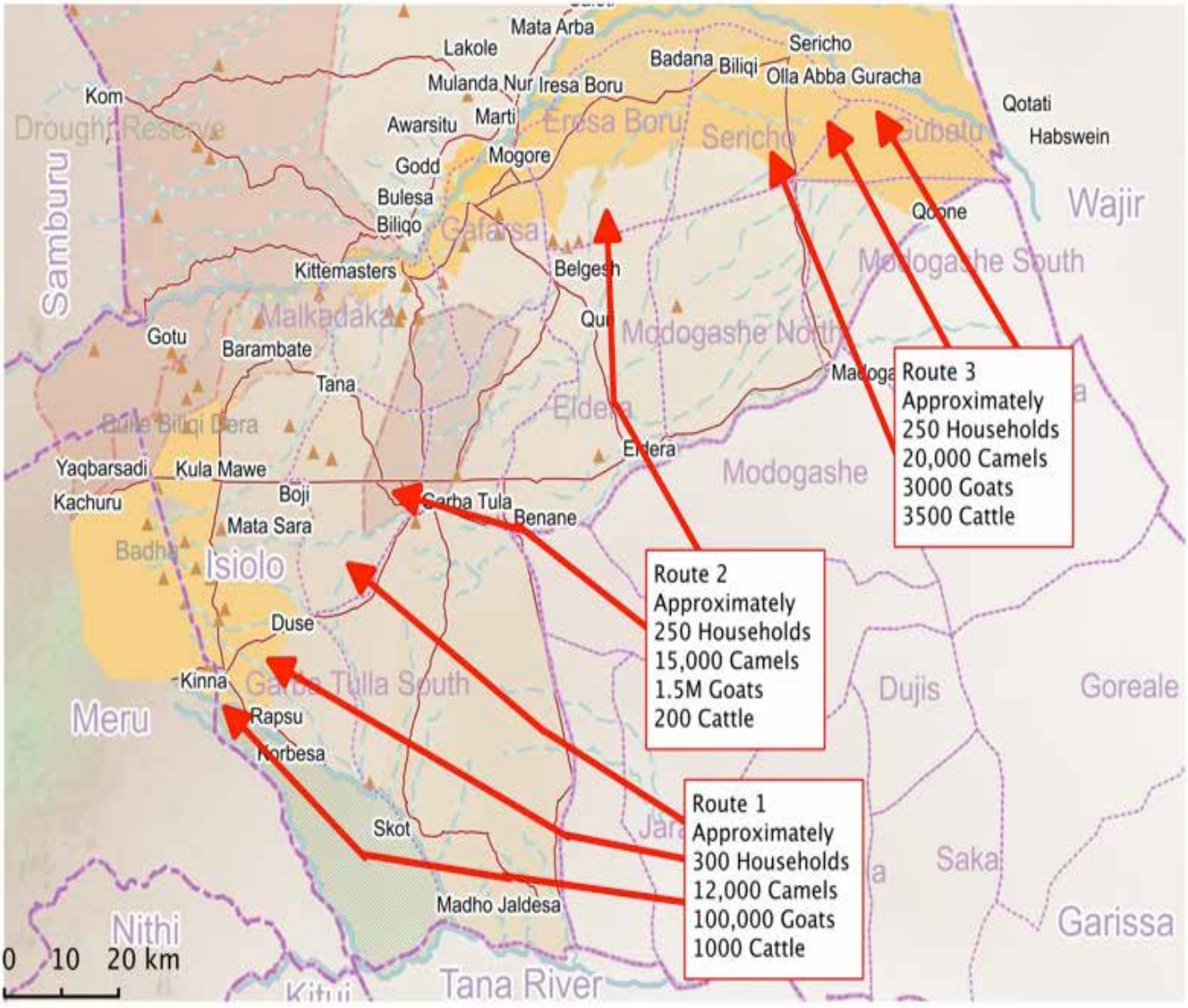

Fig. B2: Map of cross-border movements of households and livestock from Garissa County

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Appendix: Dedha Investment

1. Kinna Ward:

a) Kinna

b) Kulamawe

2. Garba Tula Ward

3. Sericho Ward

4. Former Merti Ward (includes present Wards of Cherab and Chaari)

Table A1.1a: Kulamawe

	Item	number	participants	meals type	meals cost	days/ nights	accommodation	transport type	transport cost	subtotal
March										
	meeting on grazing areas governance & responsibilities	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting for planning grazing areas according to seasons (wet/ dry/drought)	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting for dividing herds	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting at Duse	1	45	lunch & 2 teas	1200		500	1 vehicle	10000	86,500
	meeting with KWS and Assistant County Commissioner on how to conserve trees and prevent largescale charcoal burning	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	surveillance by landrover	2	12	lunch & 2 teas	1200		500	landrover	10000	50,800
	surveillance on foot	3	9	lunch & 2 teas	1200	3	500	foot	NA	137,700
	surveillance by motorbike	4	4	(2 people on both of 2 bikes)	1200		NA	bike	4000	23,200
	coordination of surveillance	6	10	lunch & 2 teas	1200	NA	NA	NA	NA	72,000
April										
	meeting on how to handle the influx	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting about use of small pastures	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting on pushing out influx from drought reserves	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	surveillance by landrover	2	12	lunch & 2 teas	1200		500	landrover	10000	50,800
	surveillance on foot	4	9	lunch & 2 teas	1200	3	500	foot	NA	183,600
	surveillance by motorbike	4	4	(2 people on both of 2 bikes)	1200		NA	bike	4000	23,200
	coordination of surveillance	6	10	lunch & 2 teas	1200	NA	NA	NA	NA	72,000
May										
	community meeting to sensitize neighbours on rules of grazing	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	preparatory meeting for surveillance	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting to review the state of pasture and water in wet and dry season grazing areas	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	surveillance by landrover	2	12	lunch & 2 teas	1200		500	landrover	10000	50,800
	surveillance on foot	4	9	lunch & 2 teas	1200	3	500	foot	NA	183,600
	surveillance by motorbike	4	4	2 people on both of 2 bikes)	1200		NA	bike	4000	23,200
	coordination of surveillance	7	10	lunch & 2 teas	1200	NA	NA	NA	NA	84,000

June										
	meeting about surveillance on foot	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting on declaration to move to dry season grazing areas	1	100	lunch & 2 teas	1200		NA	NA	NA	120,000
	meeting on conflict resolution over Moliti shallow wells	1	30	lunch & 2 teas	1200		NA	NA	NA	36,000
	surveillance by landrover	3	12	lunch & 2 teas	1200		500	landrover	10000	71,200
	surveillance on foot	4	9	lunch & 2 teas	1200	3	500	foot	NA	183,600
	surveillance by motorbike	4	4	(2 people on both of 2 bikes)	1200		NA	bike	4000	23,200
	coordination of surveillance	7	10	lunch & 2 teas	1200	NA	NA	NA	NA	84,000
July										
	meeting for preparation of surveillance using hired landrover	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting on resolution to prevent irrigation at Moliti	1	89	lunch & 2 teas	1200		NA	NA	NA	106,800
	meeting with Meru	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	surveillance by landrover	3	12	lunch & 2 teas	1200		500	landrover	10000	71,200
	surveillance on foot	4	9	lunch & 2 teas	1200	3	500	foot	NA	183,600
	surveillance by motorbike	4	4	(2 people on both of 2 bikes)	1200		NA	bike	4000	23,200
	coordination of surveillance	7	10	lunch & 2 teas	1200	NA	NA	NA	NA	84,000
August										
	meeting for logistical support for surveillance on 4 motorbikes	1	45	sahor	500		NA	NA	NA	22,500
	meeting for declaration of movement to drought reserve	1	45	sahor	500		NA	NA	NA	22,500
	meeting to discuss eruption of F&M disease	1	45	sahor	500		NA	NA	NA	22,500
	surveillance by landrover	3	12	lunch & 2 teas	1200		500	landrover	10000	71,200
	surveillance on foot	4	9	lunch & 2 teas	1200	3	500	foot	NA	183,600
	surveillance by motorbike	4	4	(2 people on both of 2 bikes)	1200		NA	bike	4000	23,200
	coordination of surveillance	7	10	lunch & 2 teas	1200	NA	NA	NA	NA	84,000
September										
	meeting for logistical support to surveillance	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	meeting to plan vaccination campaign	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	elders meet to discuss the state of pasture	1	45	lunch & 2 teas	1200		NA	NA	NA	54,000
	surveillance by landrover	3	12	lunch & 2 teas	1200		500	landrover	10000	71,200

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	surveillance on foot	4	9	lunch & 2 teas	1200	3	500	foot	NA	183,600
	surveillance by motorbike	4	4	(2 people on both of 2 bikes)	1200		NA	bike	4000	23,200
	coordination of surveillance	7	10	lunch & 2 teas	1200	NA	NA	NA	NA	84,000
October										
	dedha and police of Garbatulla discuss fencing and invasion of grazing area by wealthy pastoralists claiming it as their private land	1	45	lunch &2 teas	1200		NA	NA	NA	54,000
	meeting with community to decide how to handle badesa	1	45	lunch &2 teas	1200		NA	NA	NA	54,000
	meeting with RAP	1	32	NA	NA		NA	NA	NA	NA
	surveillance by landrover	2	12	lunch & 2 teas	1200		500	landrover	10000	50,800
	surveillance on foot	3	9	lunch & 2 teas	1200	3	500	foot	NA	137,700
	surveillance by motorbike	4	4	(2 people on both of 2 bikes)	1200		NA	bike	4000	23,200
	coordination of surveillance	7	10	lunch & 2 teas	1200	NA	NA	NA	NA	84,000
									GRAND TOTAL	**4,003,400**

Table A1.1b: Kinna

	Item	number	partici-pants	meals type	meals cost	days/ nights	accommodation	transport type	transport cost	subtotal
February										
	Meeting to discuss utilization of pasture	1	237	lunch	500	NA	NA	NA	NA	118500
March										
	meeting in which 30 volunteers were identified for surveillance	1	72	lunch	500	NA	NA	NA	NA	36,000
	meeting to resolove conflict when local pastoralist was refused entry to drought reserve	1	68	lunch	500	NA	NA	NA	NA	34,000
	dedha and community members meeting at barambate	1	42	lunch & 2 teas	1200	1	500	vehicle hire	40000	111,400
			36	lunch	500	NA	NA	NA	NA	18,000
	meeting at Barambate to discuss large influx	1	36	lunch & 2 teas	1200	1	500	vehicle hire	40000	101,200
			26	lunch	500	NA	NA	NA	NA	13,000
	surveillance on landrover to southwest	1	30	lunch & 2 teas	1200	5	500	vehicle hire	10000	265,000
	surveillance on landrover to northwest	1	30	lunch & 2 teas	1200	5	500	vehicle hire	10000	265,000
	surveillance on landrover to the east	1	30	lunch & 2 teas	1200	7	500	vehicle hire	10000	367,000
	surveillance of pasture by landrover	1	25	lunch & 2 teas	1200	3	500	2 vehicles	20000	147,500
	motorbike surveillance	3	1	NA	NA	11	NA	motorbike hire	2000	66000
April										
	surveillance by landrover to Kuro-barata	1	38	lunch & 2 teas	1200	5	500	2 vehicles	20000	343,000
	surveillance by landrover to Hardimto	1	22	lunch & 2 teas	1200	3	500	2 vehicles	20000	132,200
	motorbike surveillance	3	1	NA	NA	11	NA	motorbike hire	2000	66,000
May	conflict resolution meeting at barambate	1	30	lunch & 2 teas	1200	1	500	vehicle hire	20000	71,000
			22	lunch	500		NA	NA	NA	11,000
	surveillance by landrover to Kuro-barata	1	38	lunch & 2 teas	1200	5	500	2 vehicles	20000	343,000

	surveillance by landrover to Hardimto	1	22	lunch & 2 teas	1200	3	500	2 vehicles	20000	132,200
	motorbike surveillance	3	1	NA	NA	11	NA	motorbike hire	2000	66,000
June										
	dedha meeting to discuss how to handle influx	1	52	lunch	500	NA	NA	NA	NA	26,000
	meeting on conflict resolution with Meru attended by 2 MPs	1	120	lunch	500	NA	NA	NA	NA	60,000
	surveillance on foot	1	34	lunch &2 teas	1200	2	500	on foot	NA	115,600
	motorbike surveillance	3	1	NA	NA	11	NA	motorbike hire	2000	66,000
July										
	cross border meeting with pro-vincial administration and the community at Kachuru	1	120	lunch & 2 teas	1200	1	500	3 vehicles (2 paid by *dedha*)	20,000	224,000
	motorbike surveillance	3	1	NA	NA	11	NA	motorbike hire	2000	66,000
August										
	dedha meeting to discuss insecurity and banditry along Meru border	1	48	lunch & 2 teas	1200	1	500	3 vehicles	30000	111,600
			44	lunch	500	NA	NA	NA	NA	22,000
	dedha meeting on improvement of water supplies and water rates and storage	1	52	lunch	500	NA	NA	NA	NA	26,000
September										
	dedha consultation meeting with community on water distribution after conflict at Kom	1	60	lunch	500	NA	NA	NA	NA	30,000
October										
	dedha consultation meeting on vaccination campaign program against foot and mouth, CCPP and PPR	1	40	lunch	500	NA	NA	NA	NA	20,000
									GRAND TOTAL	**3,109,900**

Table A1.2: Garba Tula

	Item	number	partici-pants	meals type	meals cost	days/ nights	accommo-dation	transport type	transport cost	subtotal
April										
	meeting to discuss natural resource man-agement	1	34	lunch	500	2	NA	NA	NA	34,000
	meeting to plan grazing areas (separated to north and south)	2	48	lunch	500	NA	NA	NA	NA	24,000
	cross border meeting w Garissa	1	64	lunch	500	NA	NA	NA	NA	32,000
May										
	meeting to review grazing areas with Coun-ty government representatives of Garissa County	1	70	lunch	500	NA	NA	NA	NA	35,000
	dedha meeting with Garissa at Harr Buyo	1	20	lunch	500	NA	NA	NA	NA	10,000
	surveillance on foot	1	30	lunch & 2 teas	1200	7	500	NA	NA	357,000
	monitoring visits to Harr Buyo on motor-bike	10	2	lunch & 2 teas	1200	NA	NA	motorbike hire	600	30,000
June										
	dedha meeting at Belgesh	1	8	lunch & 2 teas	1200	1	500	vehicle hire	10000	23,600
	monitoring visits to Harr Buyo on motor-bike	10	2	lunch & 2 teas	1200	NA	NA	motorbike hire	600	30,000
July										
	*dedh*a meeting at Madokile	1	6	lunch & 2 teas	1200	1	500	vehicle hire	10000	20,200
			70	lunch	500	NA	NA	NA	NA	35,000
	monitoring visits to Harr Buyo on motor-bike	10	2	lunch & 2 teas	1200	NA	NA	motorbike hire	600	30,000

August										
	ramadan									
September										
	preparatory meeting for opening taiboto borehole	1	29	lunch	500	NA	NA	NA	NA	14,500
	2 guards hired for taiboto borehole		2			6000 per month				12,000
October										
	dedha meeting selection of committee and design of management	1	50	lunch	500	NA	NA	NA	NA	25,000
	surveillance of taiboto borehole		3	lunch & 2 teas	1200	19		motorbike	500	77,900
									GRAND TOTAL	**790,200**

Table A 1.3: Sericho

	Item	number	participants	daily rate	amount	days/ nights	accommo-dation	transport type	transport cost per vehicle per trip	subtotal
March										
	Meeting of Iresaboru *Dedha*									
From late May until early October										
	30 Ollas nominate 2 volunteers each		60	daily rate	200	90				1,080,000
June										
	meeting at Hawaye for Badana, Sericho, Biliqi and Gubatu	1	60	daily rate	300	1		vehicle hire	10,000	28,000
	meeting at Forosa Pan for Iresaboru, Eldera & Modogashe	1	10	from outside the area (daily rate)	300	1		vehicle hire	10000	13,000
			40	at home (no daily rate)						
July										
	meeting at Hawaye for Badana, Sericho, Biliqi and Gubatu	1	60	daily rate	300	1		vehicle hire	10,000	28,000
	meeting at Forosa Pan for Iresaboru, Eldera & Modogashe	1	10	from outside the area (daily rate)	300	1		vehicle hire	10000	13,000
			40	at home (no daily rate)						
August										
	meeting at Hawaye for Badana, Sericho, Biliqi and Gubatu	1	60	daily rate	300	1		vehicle hire	10,000	28,000
September										
	meeting at Hawaye for Badana, Sericho, Biliqi and Gubatu	1	60	daily rate	300	1		vehicle hire	10,000	28,000
									GRAND TOTAL	**1,218,000**

Table A 1.4: Former Merti

	Item	number	participants	daily rate	amount	days/ nights	accommodation	transport type	transport cost per vehicle per trip	subtotal
May										
	meeting in Merti about opening of dry season boreholes - included participants from Merti and 30 from Chaari who came by cars and motorbikes. 5 days later, boreholes were opened	1	20	lunch	500	NA	NA			96,000
			30	teas & lunch	1200	NA	NA	2 trips by 2 vehicles	10,000	
								2 motorbikes	5000	
From late May until early October										
	16 meetings per month at Yamicha 4 boreholes from late May-October	96	120	teas & lunch	1200	NA	NA	NA	NA	13,824,000
	surveillance on foot and camel 30 days per month for 6 months		60	teas & lunch	1200	180 days	500	on foot and camel	NA	18,360,000
June										
	meeting on 18th June to remove non-lactating livestock from riverine areas to Chaari	1	12	teas & lunch	1200	NA	NA	NA	NA	14,400
	meeting to discuss livestock movement to Chaari drought reserve included 30 local participants and 30 from outside who came in 2 hired vehicles	1	30	teas & lunch	1200	1	500	2 vehicles	10000	86,000
			30	lunch	500	NA	NA	NA	NA	
	Meeting at end of June-July to discuss security relation with neighbours from Samburu	1	60	teas & lunch	1200	1	500	3 vehicles	10000	112,500
			20	lunch	500	NA	NA	NA	NA	

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July										
	meeting with neighbours to sort out conflict attended by Governors of Isiolo and Samburu and Laisamis people from Marsabit	1	84	teas & lunch	1200	2	500	1 lorry	60000	345,600
	meeting with security people towards the end of July incl. 3 vehicles from Merti to Chaari	1	77	teas & lunch	1200	1	500	3 vehicles	10000	160,900
August										
	(ramadan)									
September										
	meeting in Chaari about how to go to Dogogicha after the conflict with Samburu	1	12	tea & lunch	1200	1	500	1 vehicle to Chaari	10000	46,800
			22	tea & lunch	1200	NA	NA			
									GRAND TOTAL	**33,046,200**

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