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MAASAI PASTORALISTS : DIVERSIFICATION AND POVERTY

K. Homewood, E. Coast, S. Kiruswa, S. Serneels, M. Thompson, P. Trench

Context

Sub-Saharan African pastoralism involves highly fluid production systems responding flexibly to variable and unpredictable arid and semi arid rangeland environments. Household wealth is typically subject to stochastic events and most pastoralist groups have a history of entire families shifting in and out of the system as their fortunes have changed¹. This potential to re-enter the system has been maintained by the often communal nature of land tenure in pastoral societies, alongside the potential to restock through raiding, trading (including wild resources), or cultivation². However, the last hundred years have seen a drastic decline in the commons available for extensive pastoralism³. Large areas of land have been given over to alternative uses as pastoral populations have become marginalized within most African nation states^{4,5}. Extensive land loss to conservation⁶ and rapid piecemeal privatisation of formerly communal rangelands for agriculture and ranching enterprises⁷ are framed within an environmental discourse that invokes Hardin's Tragedy of the Commons to justify land alienation and subdivision⁸. This process has entailed the loss of access to key dry season land and water resources.

Arbitrary national boundaries, the interplay of geopolitical tensions^{9,10,11,12,13} and associated civil wars¹⁴, have exacerbated the situation for many pastoralists.. The implications of this spiralling loss of, and exclusion from, land are momentous. The cycle of movement out of and back into pastoralism, formerly dependent on the ability of individuals and families to rebuild their livestock holdings, now depends on access to land as well. There is increasingly a one-way trajectory out of pastoralism into poverty and livelihoods on the margin^{11,15,16,17,18,19,20}.

Maasailand, split between Kenya and Tanzania, has experienced many of these land pressures, with rangelands taken out of pastoral production for a variety of State and private purposes^{21,22,23} including conservation through gazetting of protected areas⁶ and commercial cultivation, capturing key resources for both large-scale cereal farming^{3,24} and intensive irrigation,²⁵. Remaining rangelands are themselves increasingly privatised through sub-division (Kenya) and allocation of rights for ranching, farming or wildlife enterprises (Tanzania). High rates of internal population growth and in-migration^{26,27} have added to both real and perceived pressures on key resources. Violent clashes have occurred^{23,28} exacerbated by vested political interests²⁹.

Increasingly restricted access to key resources of pasture, water and through-passage have increased pastoralist vulnerability to drought herd loss. The large-scale privatisation of Maasailand, pursued by many as the best way of ensuring security of tenure, and by some as a way of investing and accumulating capital, is also resulting in individual pastoralists becoming landless. When pastoralist households lose both their livestock and their land, there is no way back unless they are able not only to rebuild their herds, but to raise the capital required to buy land. The decline of the commons in Maasailand is leading not only to declining numbers of livestock and people they support; it is resulting in increasing numbers ceasing to be pastoralists. "The poor are not us"²,^{30,31}: they are landless and stockless poor, as are so many others whether formerly pastoral or non-pastoral. These factors are affecting all Maasai, and pastoralists across the wealth spectrum are diversifying in response. The study of pastoralist vulnerability thus becomes the study of diversification of pastoralists into non-livestock-based strategies to avoid or alleviate poverty. This paper explores patterns, scale and trends of poverty-related diversification in Maasailand. We present a linked set of studies in Kenya and Tanzania to address a series of hypotheses. Based on the theory that livelihood diversification for Maasai

pastoralists demonstrates close parallels with the broader process of rural livelihoods diversification taking place across sub Saharan Africa^{20, 32, 42}, we postulate that

(a) Diversification is found in

- activity/occupation;
- primary sources of income
- location/residence

(b) Both poor and wealthy diversify

- poor diversify into unskilled, low status activities with low returns, and little or no job security.
- better-off diversify into skilled work that commands secure, well-paid jobs.

(c) Within pastoralist groups, pressures on access to key resources, including cultivable land, result in an accelerating differentiation. The poorest individuals and households may drop permanently out of pastoralism.

Study context and data

The research presented here focuses on the populations of protected area-adjacent zones either side of the Tanzania/ Kenya border. The contrasts between Kenyan and Tanzanian lands potentially offer a controlled comparison, with related issues and factors operating in essentially similar ecological, ethnic and socio-economic circumstances, but radically different macro-economic and political contexts. This research strategy has been used successfully to dissect related issues elsewhere^{30, 28, 33}. The data in this paper are drawn primarily from three separate studies, carried out by different people and for different purposes, but each using basically the same household survey approach^{35, 26, 27, 33}, (Table 1). Data collection was based on multi-round and single visits to a total of several hundred households distributed across all study sites. Methods included quantitative household surveys combined with semi-structured interviews and informal discussions developing qualitative understanding of local situations. Samples included households from across all wealth ranks within each study area. The data therefore address poor pastoralist households and individuals not as an isolated group, but in the context of the wider pastoral system. Separate publications detail individual narratives illustrating the implications of the different livelihood strategies and pathways into and out of poverty.

The first of the three studies uses data from a large-scale (n= 1,554 households) cross-border comparable survey of socioeconomic indicators for the Maasai³⁴, collected in Narok and Kajiado Districts (Kenya) and Ngorongoro District (Tanzania). Because the purpose of the large-scale survey was primarily socio-demographic, detailed information on livestock ownership and cultivation were not collected. The strength of these data for the current study lies in their cross-national comparability and in providing a background against which the detailed studies might be placed. They also develop detail for the population of Ngorongoro Conservation Area (NCA), an area with particular poverty/conservation circumstances. These cross-sectional data from 1998 provide some recent historical context for the two detailed studies, *Mara* (Kenya) and *Longido* (Tanzania). In particular, the Mara study concerns sites nested within the broader Narok/Kajiado study. The major differences between the Narok/Kajiado/Ngorongoro datasets and the more detailed Longido and Mara datasets is their breadth as opposed to depth of information. The Narok/Kajiado/Ngorongoro datasets cover a much larger sample, but include only dichotomous categories for livestock ownership and cultivation, and no data on income or levels of livestock ownership. By comparison, the Longido and Mara datasets provide detailed information on livestock ownership and income. All datasets collected detailed information on occupations.

The Mara site Group Ranches (Siana, Koiyaki and Lemek), and Narok District in general, are rural, largely open semi-arid rangelands, with wide ranging herds of cattle and small stock. The population is almost exclusively long term resident Maasai³⁵, bordered to the west by a series of small enclave areas, where the balance of ethnicity has been significantly altered by in-migration, primarily of Kipsigis²⁸. The Kajiado data focuses on extensive low-lying rangelands, bordered to the west by the Nguramen Highlands and to the south by Shompole swamp. The Tanzanian Ngorongoro Conservation Area (NCA) is a “joint land use” setting where agro-pastoralism, tourism and wildlife conservation co-exist in a continuously contested balance. The Longido study focuses on rural rangelands served by small trading centres^{33,36}. The populations are almost exclusively long term resident Maasai, with the exception of more ethnically diverse trading and service centres.

Map 1 about here

For much of their extent Mara, Narok and Kajiado in Kenya and Longido in Tanzania have broadly comparable climates, with gradients of 300-600mm annual rainfall across most of each area with high variability and bimodal patterns. However, more of Mara is less arid, and the north-west of Mara borders on the Mau escarpment, where rainfall reaches 1200mm/yr. The Ngorongoro sites, situated in the Crater Highlands, can receive over 1,000mm rain per annum.

Methods

The research hypotheses are tested by means of:

1. Cluster analysis to establish a typology of livelihood diversification and land use strategies using binary data to summarise presence/absence for a comprehensive list of household economy variables¹
2. For Mara and Longido datasets:
 - Regression analysis using sociocultural and agro-ecological/spatial variables of determinants of income.
 - Analysis of change over time is further explored using the Mara dataset between baseline (1998) and follow-up (2004) data, collected at 5 sites in the Mara region.

Table 1: Study descriptions

| | No sites | Households | Dates | Ref |
|--------------|-----------------|-------------------|--------------|---------------|
| Kenya | | | | |
| Mara | 5 | 288 | 1998 | Thompson 2002 |

For Mara and Longido study sites, these variables were:

- livestock production (3 variables: income from livestock or livestock products, livestock slaughter; livestock purchase),
- agricultural production (4 variables: cultivating lowland, cultivating upland; crop consumption; crop sales);
- income from a wildlife or conservation related activity (1 variable including irregular sale of crafts to tourists, employment as a tour guide or park ranger, land leasing programmes or land rents).
- off-farm income (3 variables: *wage or salaried* position (including permanent skilled employment such as teacher, or government employee, and casual regular or irregular employment such as night watchman, labourer, herdsman or driver.); *petty trade* (including regular or irregular small scale sales of firewood, groceries such as tea, sugar and soap, honey, hides); *business income* (including regular trading of livestock or hides, dealing in gems, shop or hotel owner, beer brewing, or artisan). Remittances are included as a separate category within off-farm income

| | | | | |
|-----------------|---|-----|--------|---------------------|
| | 5 | 219 | 2004 | Thompson 2005 |
| Narok/Kajiado | 2 | 634 | 1998 | Coast 2002 |
| Tanzania | | | | |
| Ngorongoro | 3 | 920 | 1998 | Coast 2002 |
| Longido | 6 | 229 | 2002-4 | Homewood et al 2005 |

Analyses

Overviews of the main livelihoods strategies across the three datasets are presented first using descriptive statistics, followed by a description of the cluster analyses. The third section presents regression analyses from the detailed Longido and Mara studies on variables associated with income, followed by trend analysis (1999-2004) for the Mara data.

Cluster analysis classifies data into categories: in this case, households were classified on the basis of livelihoods activities and economic variables, giving clusters interpreted here as livelihood strategies. Cluster analyses for the Mara and Longido datasets were performed using ACEBIN in SAS. Cluster analysis for the Narok/Kajiado and Ngorongoro datasets include broadly comparable variables to the Mara/Longido studies and were done using SPSS. The large sample size for these data required the use of two-step clustering in order to make the problem tractable, with cases automatically assigned to “pre-clusters”, which were then clustered using hierarchical clustering.

OLS multiple regression determined those factors that influenced household wealth in terms of gross annual income. Dependent variables were broadly comparable for both study sites and included geographical, spatial and socio-economic data. In all cases, initial correlation analyses identified variables to be excluded to avoid multicollinearity and instability in the final models. Dependent variables that were not normally distributed were transformed. Where data were log transformed (e.g. for livestock numbers or distance to water), zero values were included in the analysis by adding 1 or 0.1 depending on the scale of the data.

Household livelihoods strategies: Descriptive statistics

Tanzania study sites: Ngorongoro and Longido

Ngorongoro (1998)

The Tanzanian large-scale comparative data were collected from 3 sites in NCA. All of the NCA sites had varying levels of isolation and potential for non-farm activities. Cattle ownership remains high, with less than 2% of all households reporting no cattle ownership at the time of the survey. Most (88%) of NCA households reported some form of cultivation in 1998. Cultivation was banned in NCA until the 1990s and it is still forbidden to cultivate with anything other than hand hoes. The ban on tractors or ploughs precludes large-scale farming. Subsistence cultivation predominated with little opportunity for cash cultivation and less than 2% of households had been cultivating for more than a decade. A cool upland setting with >1,000mm precipitation per annum has allowed cash crop cultivation to develop in Irkeepus village for the very local tourist lodge market. Recent, but very rapidly growing, rural-urban migration stream for paid employment has been identified (Coast, 2006³⁷; Homewood, Coast & Thompson, 2005; May & McCabe, 2004), particularly among unmarried Maasai men, with implications for remittance receipt. 26% of households reported some form of off-farm income, and 23% reported petty trading, but just 3% of households were involved in business.

Longido (2002)

The overwhelming majority of Longido households own livestock (95%), but herd size and composition vary widely. Seven per cent of households own half of all livestock, and 85% own fewer than 8 TLU/AE. Livestock represent an important source of income, with 59% of Longido households reporting livestock sales during the course of this study. Overall, Longido households derived 43% of their income from livestock, 34% from non-farm activities and 22% from cultivation. Just 1% was derived from wildlife conservation-related activities. The mean Longido gross annual income \$809 per household of 9 Adult Equivalentsⁱⁱ, is inflated by the skewed nature of the data, with a few better off households distorting the average. Incomes are on average very far below the poverty datum line of \$1/person/day, with median household annual income of \$304 for a median household size of 8 AEs.

Farming in Longido was initially encouraged by government policy in the 1970s. Recurrent drought, a deteriorating local economy, and diffusion of practices from agricultural immigrants have resulted in the adoption of cultivation by Longido Maasai despite the area's limited agro-ecological potential. Overall 67% of all households cultivated land in 2002/3, but during our study period, 37% of lowland and 22% of upland farms sampled failed to harvest due to drought and wildlife damage, and crops contributed less than one quarter of overall income. Cultivation is limited by scarcity of labour and rainfall as well as of land. Of the 74 households that owned uncultivated land, 45% did not plan to expand the area under cultivation, citing costs and availability of labour, oxen or tractors as the main constraints. Maasai in Longido commonly rely on *Empesi* – a system of cooperative work parties. In 2003, 10% of households used *Empesi* for clearing and tilling land, 6% for planting, and 48% for weeding. While *Empesi* provides a cheap source of labour it comes with other costs. Those households that rely on *Empesi* must wait their turn; the lower down the list, the later the preparing and weeding and the greater the risk of a poor harvest.

Longido is isolated, with limited potential for diversification into non-farm activities compared with other Maasailand areas. In spite of the relatively limited opportunities, 50% of all households receive off-farm income, with a mean value of \$351 (s.d. \$513) Alternative sources of income, included working as a watchman, government employee, teacher or casual labourer, rent from urban properties, livestock trading, sale of firewood or traditional craftwork and businesses, such as owning a small hotel or restaurant. Most women were involved in petty trade of staple items such as milk from the cattle in their care, and retail of tiny quantities of tea and sugar to neighbouring households. Remittances were also included within non-farm income.

Wildlife tourism is still limited in Longido; access is poor and there are areas of higher wildlife density and better tourist services nearby. Only 4% of households reported any income from selling crafts to tourists, with a value of just \$4. The development of community-based conservation enterprises have been constrained by hunting concession agreements between hunting companies and the central government. Recent conversion in status from Game Controlled Area to Wildlife Management Area (WMA) in theory changes this situation dramatically, but may not actually do so in practice.

Kenya study sites

ⁱⁱ Adult Equivalents calculated using definition from (Little, 1985): 15-60 yrs = 1 unit; 7-14 and >60 = 0.67 units; <7 = 0.25 units

Narok and Kajiado Districts (1998)

The Narok and Kajiado study included households from three different Group Ranches with varying levels of isolation and potential for non-farm activities. Cattle ownership was high, with less than 3% of all households reporting no cattle ownership at the time of the survey. One in five households had been cultivating for more than a decade. Nearly half (45%) of households reported some form of cultivation in 1998. Olkirmatian Group Ranch has experienced rapid development of cash crop cultivation for the export market, due in part to perennial water source allowing irrigation. Nearly half (48%) of these households reported some form of off-farm income, and household involvement in business and petty trading was relatively higher than in NCA, at 22% and 40%, respectively.

Mara (2004)

The vast majority of households in the Mara study sites (98%) own livestock. Mean livestock holdings are highly skewed: 12.8 TLU/AE for an average household of 7.4 AE, compared with a median of just 6.2 TLU/AE. However, nearly all (95%) of households derive over two thirds of their income from livestock. Income is also skewed at the household level, with mean gross annual income of \$2495 compared with median gross annual income of \$1626. Two thirds (65%) of Mara households own land (mean 106 acres±59 acres). These figures complement earlier analyses of distribution of land and livestock holdings among Maasai.

Few (22%) Mara households cultivate their own fields and even fewer report any income from this activity, with just 14% reporting a harvest in 2004. A few (n=9) households make considerable returns from mechanised cultivation, or from leasing land out to commercial cultivators, with profits of approximately \$1500 per year. However, cultivation remains largely unprofitable for the majority of Mara households, representing approximately 22% gross income for approximately 13% of all households.

Non-farm activities (waged work, business, petty trade) constitute the second most important source of income in Mara, averaging 30% of gross annual income for those two thirds of Mara households involved. Nearly half (46%) of Mara households reporting engaging in petty trade, with an average return of \$300/year. 28% households reported a member in waged employment, bringing an average annual income of \$720. The proportion of Mara households reporting off-farm income (65%) is thus higher than for the broader Kajiado/Narok area (48%), probably reflecting change over time between the two sets of data (cf Kajiado/Narok 1998, Mara 2004).

Wildlife tourism is highly developed around the Masai Mara National Reserve, although access to income streams from this industry is not universal. Around 50% all households in Mara earn conservation income, averaging 14% total gross income for those involved. Once again, income from conservation related activities is highly skewed, with a few households earning much higher income than the majority: income from conservation and wildlife averages \$247, with a median of \$88).

Household Livelihoods Strategies: Cluster Analyses

Large-scale cross border study (1998)

Cluster analysis identified six livelihood strategy clusters for Narok/Kajiado and five for NCA (Table 2). These data do not permit any income/ wealth levels to be attached to these clusters, and comparisons can only be made on the basis of presence/absence of livelihood activities.

Table 2: Percentage distribution of Narok/Kajiado and NCA households by livelihood strategy cluster

| | Narok + Kajiado (Kenya) | Ngorongoro (Tanzania) |
|--|--------------------------------|------------------------------|
| Undiversified pastoralist | 26% (n=163) | 10% (n=93) |
| Undiversified agropastoralist | 12% (n=76) | 61% (n=558) |
| Diversified agropastoralists + wildlife | 15% (n=94) | 15% (n=134) |
| Diversified agropastoralists + petty trading | 19% (n=123) | 7% (n=65) |
| Highly diversified agropastoralists | | 8% (n=70) |
| Diversified agropastoralist + business | 15% (n=94) | |
| Highly diversified pastoralist + wage | 13% (n=84) | |

Overall, levels of livelihood diversification were significantly higher in Narok/Kajiado compared to NCA, where 71% of households reported no diversification away from “traditional” pastoralism or agro-pastoralism. This is unsurprising in view of the major constraints on livelihoods in NCA, and the lack of other opportunities for resident Maasai. It should not necessarily be taken as representative of a lack of diversification in poorer Tanzanian pastoralist populations generally. Levels of business, petty trade and waged income are all considerably higher in Narok/Kajiado relative to Ngorongoro (Figs 1-2). The only diversified income stream that is equally important in the two areas comes from wildlife and tourism related activities. Without income data, it is not possible to tell whether the absolute value of income to the households concerned is also equivalent.

Fig. 1

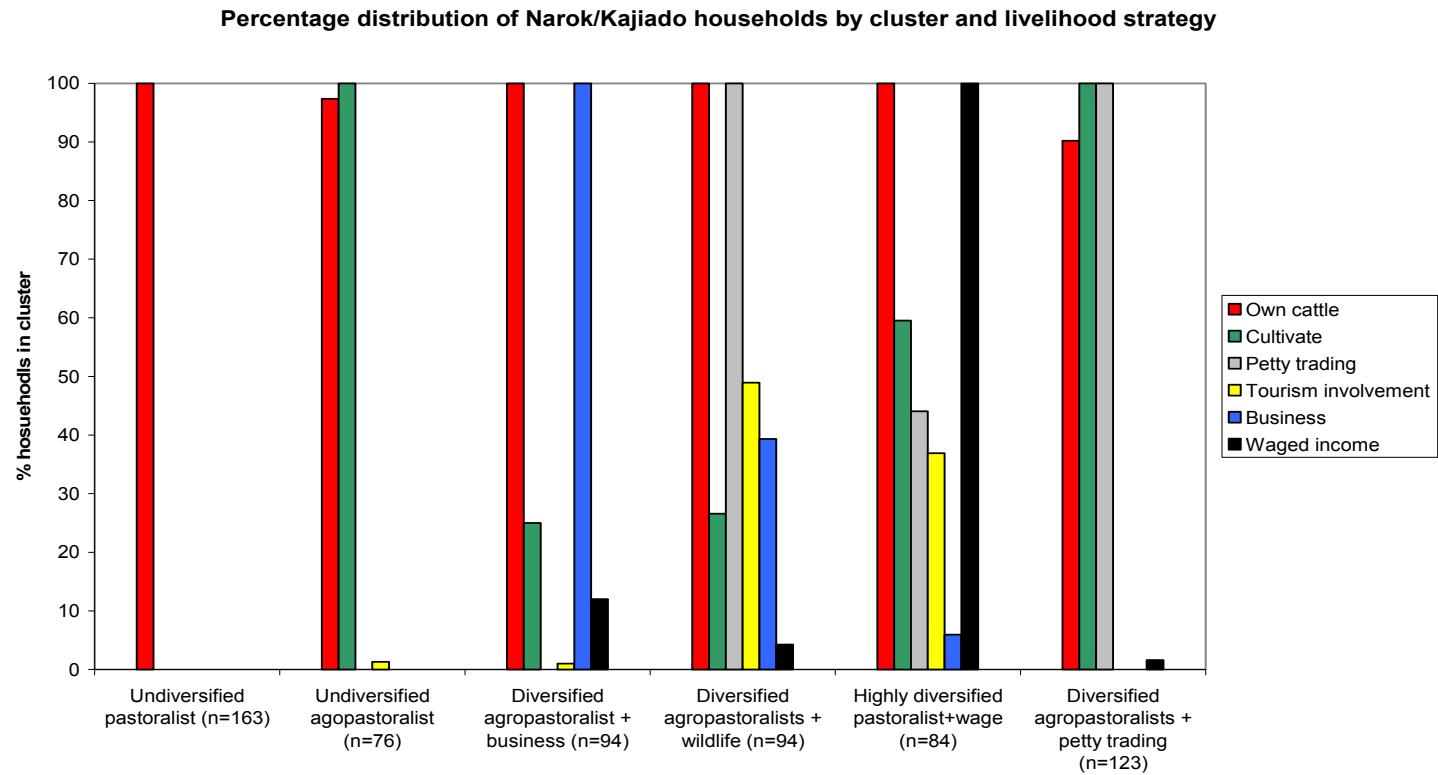
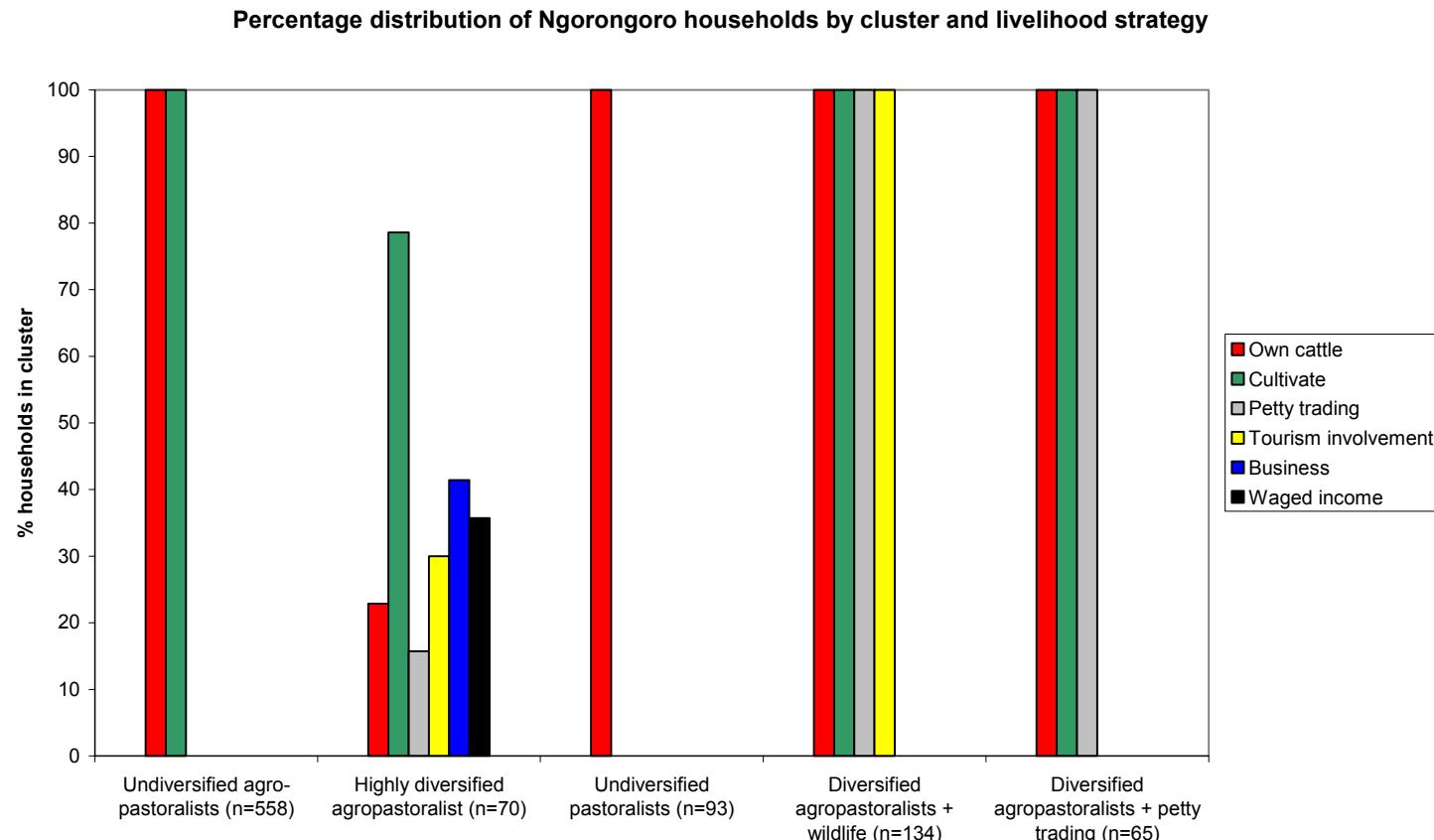


Fig. 2



Mara / Longido studies (2002-4)

Eight clusters of livelihood strategies were identified for Longido. The two smallest had no reported income at all other than remittances and for the purposes of our analyses were combined in one cluster of “Poorest”. The five poorer clusters average less than \$1/person/day in terms of gross mean income. Five livelihood strategy clusters were identified for the Mara study area. All households were involved in livestock keeping and trading. Table 3 shows the gross annual income per cluster, and the gross income generated through different activities. Fig. 3 shows the proportion of the total income that comes from the different activities the cluster households are involved in.

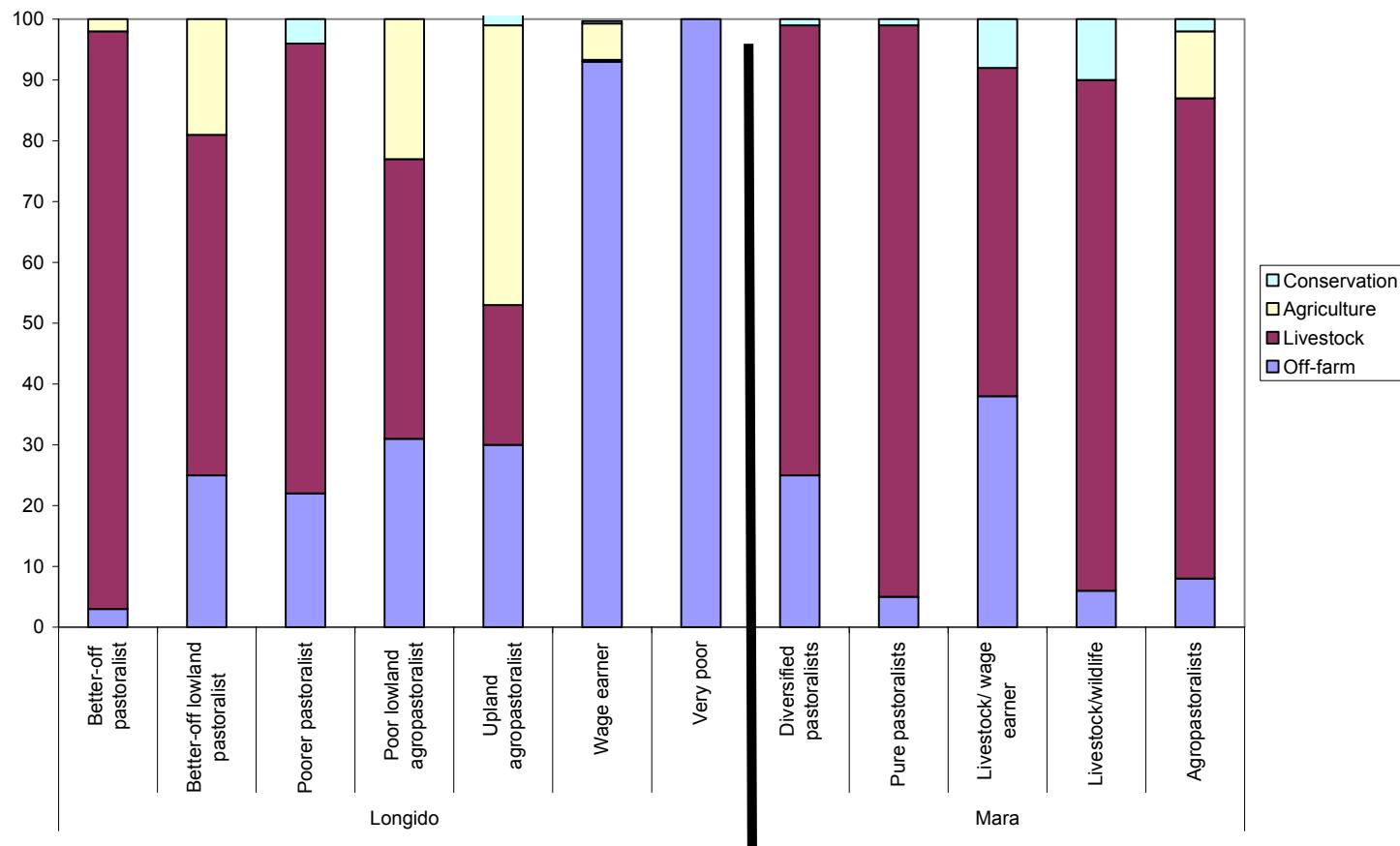
Out of the land-use strategy clusters in Mara, only the livestock/ wage earners had near-significantly lower incomes than households in other clusters ($p < 0.06$). In Longido, the high variance within each cluster and the non-normal distribution of the data, even excluding zero values, is such that only the well-off lowland agro-pastoralists have a significantly higher gross income than all other clusters ($P < 0.05$, Tukey’s HSD). Low median values relative to the means show the degree to which a few very wealthy households skew the data, particularly for the wealthier clusters

Table 3: Cluster-level gross annual income and relative contribution of livelihood strategies, Mara and Longidoⁱⁱⁱ

| | Longido | | | | | | | Mara | | | | |
|---|-------------------------|--------------------------------------|--------------------|-------------------------------|-------------------------|-------------|-----------|--------------------------|-------------------|------------------------|--------------------|-------------------|
| | Better-off pastoralists | Better-off lowland agro-pastoralists | Poorer pastoralist | Poor lowland agro-pastoralist | Upland agro-pastoralist | Wage earner | Very poor | Diversified pastoralists | Pure Pastoralists | Livestock/wage earners | Livestock/wildlife | Agro-Pastoralists |
| Number of households | 21 | 46 | 29 | 25 | 70 | 29 | 8 | 45 | 27 | 43 | 60 | 44 |
| % households with income | 100 | 100 | 100 | 74 | 93 | 89 | 22 | 100 | 100 | 98 | 98 | 100 |
| Mean gross annual income/hh (\$) | 1413 | 1978 | 413 | 358 | 229 | 291 | 23 | 2153 | 2736 | 1700 | 3041 | 2721 |

ⁱⁱⁱ In this table, the % contribution of different activities to mean annual income is calculated across the entire cluster sample in each case, including zeros

Fig 3: Percentage of total household income from different sources by cluster and study site, Mara and Longido.



The significant difference in levels of diversification between the Tanzanian and Kenyan sites in the large-scale cross-border study is not repeated for the Longido/Mara sites. Table 3 shows rather comparable levels of diversification, though encompassing very different opportunities and levels of income in Mara and Longido. In terms of proportional contribution to income, some of the Mara and Longido clusters bear close comparison. “Better-off pastoralists” in Longido average 95% of their income from livestock, 3% from off-farm and 2% from cultivation. This is strikingly similar to the Mara “pure pastoralists” cluster, averaging 94% income from livestock, 5% off-farm and 1% from conservation. Longido’s “poorer pastoralists” derive a mean 74% income from their livestock, 22% from off farm and 4% from wildlife/conservation. Mara’s “Diversified pastoralists” derive 74% from livestock, 25% from off-farm and 1% from wildlife/ conservation. This close comparability of proportional contributions from different income streams does not carry through to income levels, with Longido mean annual incomes averaging from 1/2 to 1/4 of the annual incomes in the Mara for these two pairs of clusters. None of the other clusters show such close comparison between Mara and Longido. However, it is striking that diversification, as measured by a greater spread of proportional contributions across income streams, is if anything more marked in Longido for most other clusters. The exceptions are the Longido very poor, who are completely dependent on off-farm income, and the Longido wage earners who derive virtually all their income off farm, unlike the Mara wage earner cluster for whom off farm contributes just 1/3, with livestock contributing over half annual income. In Mara, although median gross annual income is more even across clusters, mean and median annual

income are significantly lower for the livestock/wage cluster, and higher for the livestock/conservation cluster, relative to all others.

In summary, in Longido diversification away from pastoralism is high among both the wealthy and the poor, and differences in income levels suggest qualitative differences in the types of diversification these different groups are pursuing. A similar pattern is seen in the Mara, although for these wealthier households on balance pastoralism remains the most significant source of annual income compared to other activities.

Box 1. Longido Livelihood clusters

Well off pastoralists (n=21). Members of this cluster own, sell, buy and slaughter livestock. A few households cultivate lowland plots (14%), but their returns are small. They average a relatively high gross annual income although within the cluster variance is high (mean: \$1413; median \$682). 95% of this income is derived from livestock and livestock products, with little or no income from agriculture and other sources. There is a wide range of wealth in terms of livestock holdings (3-490 TLU, mean: 85). Diversification into off-land activities is relatively low: 14% of households have income from business and petty trade, 10% from conservation, and 5% from wage but the contribution to the household income of these activities is very low, just 3%.

Well off lowland agropastoralists (n=46). 100% of households in this cluster owned, sold and slaughtered livestock and 93% also cultivate lowland plots, with 87% harvesting. These households average the highest gross annual household income (mean: \$1978: median: \$1032). These households were highly diversified with 54% earning income from business, and 26% from wage and petty trade activities. Households in this cluster are significantly better off than other clusters on a range of measures, mean household size is higher than other clusters (14 AUE/household), meaning high labour availability reflected by the high number of productive workers (i.e. household members older than 6 and not in school). All households in this cluster received some income during the course of this study, and the sources of this income were distributed more evenly between livestock and livestock products (56%) off-land activities (25%) and agriculture (19%). Livestock holdings on average were high, but again numbers were highly skewed, with a few households owning the majority of livestock (mean TLU/household: 113; median: 48, range: 6-830.)

Poorer pastoralists (N=29). All households in this cluster have livestock, and virtually all get an income from livestock or livestock products (97%). However, relatively few bought livestock (10%) and none slaughtered livestock. Only one of these households cultivated and they did not get any harvest. On average, households in this cluster rely more on off land income than their wealthier counterparts: around one-third households have wage income and one in five have some wildlife income, and these sources account for 26% of the overall income. Like wealthy pastoralists, all households in this cluster receive some income, although that income is considerably lower (mean: \$413; median: 245). Livestock holdings are also lower (range: 1-267 TLU; mean: 20)

Poor lowland agropastoralists (n=25). 96% of households in this cluster own livestock but only a third received an income from their livestock and none slaughtered livestock. 93% cultivate lowland areas of land no different in size from their wealthier counterparts, but only 36% harvested. Among those that did harvest, there is no significant difference in the value of harvest sold. However the *well- off lowland agropastoralists* cluster has a significantly better harvest as reflected in the value of the crop consumed by the household (perhaps reflecting their better labour availability and access to better quality land). Only 74% of households in this cluster reported an income during the year, split relatively evenly between livestock sources (46%), off-land sources (31%) and agricultural production

(23%). Mean gross income was much lower than their wealthier counterparts (mean: \$358; median: \$193) as were livestock holdings (mean TLU/household: 32; median: 9, range: 0-300.).

Upland agropastoralists (n= 70). As the name suggests, the great majority of households (85%) in this cluster cultivate land. They have significantly higher income from crops than any other cluster, but the value of harvest consumed is less than that of *well off lowland agropastoralists*, implying a greater reliance on the sale of harvest for cash needs, irrespective of longer-term food needs. The majority own livestock (91%) and 93% reported some income during the year, although gross income levels were low (mean: \$229, median: \$128). This is the only cluster that on average earns a greater proportion of income from agriculture (46%) than other activities. 30% of income is from off-land activities compared to just 23% from livestock. Livestock holdings are again relatively low (mean TLU/household: 36; median: 17, range: 0-290.)

Wage earners (n=29). Households in this cluster rely almost exclusively on off-land activities for their income, with 86% of households having a wage earner contributing to household income. 93% of the gross income in this cluster is from off-land activities: mostly wages, with a couple of households (7%) also receiving significant income from remittances. Gross income is again low (mean: 376; median: 243) and livestock holdings are also similar to the previous two clusters (mean TLU/household: 34; median: 8, range: 8-314). 11% of households in this cluster reported no income during the course of the study.

Poor (n=8) Only 25% of households in this cluster reported any income from any of the sources investigated, all of which came through remittances and averaged just \$23/year. These households are thus entirely dependent on others. All households in this cluster own livestock, but mean livestock holdings were very low compared to other clusters (mean: 4.1 TLU/household; median: 3.2).

Box 2: Mara livelihood clusters

Diversified pastoralists (44 households). These livestock keeper/traders also work off-farm in either businesses or petty trade (mean annual income from petty trade \$254). About half these households generate income through wages from formal employment (\$749) and a few (n=7) received some conservation income. None derived income from cultivation. Herd sizes average 79 TLU/household (median 30 TLU per household, 8.8 TLU/AE). The total value of animals leaving the herd on average is considerably higher than the value of the animals entering the herd.

Pure pastoralists (26 households), have very few other activities. Average herd size is significantly lower than the other cluster means at 50 TLU per household and median herd size is even smaller, (27 TLU; 4.8 TLU/AE). These households have the highest average livestock sales activities, and spend much less on purchasing animals. Livestock gifts into the household are generally high, on average almost equivalent to the value of the animals sold, though the median value of livestock gifts received (482\$) is less than one third of the mean value (1730\$). This indicates that for half of the households, livestock sales are not compensated by gifts. Again, the total value of the animals leaving the herd through sales, slaughter or gifts is on average larger than the value of animals entering the herd.

Livestock/wage earners (43 households), are all involved in livestock trading and mostly gain additional income from wage employment. This averages \$ 711/household/yr, considerably higher than the income generally derived from businesses and petty trade. Livestock purchases exceed sales.

Average herd size is intermediate at 65 TLU (median 50 TLU; 6.2TLU/AE). Overall this cluster has significantly lower incomes than all other clusters.

Livestock/wildlife (60 households) have the largest average (and median) herd size (84 TLU and 59 TLU respectively), and are active traders. The value of animals leaving the herd almost equals the value of animals entering the herd. The average income derived from conservation is \$326/household/yr, but the variability amongst cluster members is large, with the maximum income from conservation reaching \$4583/household/yr compared with a median of only \$90/household/yr. About one-third of these households are also involved in off-farm activities, generating additional income comparable to the average amounts derived from conservation.

Agro-pastoralists (42 households) are involved in small-scale and/or mechanized farming or leasing land to outside contractors. 40 out of 42 members of this cluster cultivate and 70% of them also harvest. Land leasing generates large and guaranteed income for the very few households (n=7) involved. Returns from small-scale cultivation are much lower (median \$100/household/yr). About 35% of these households manage to get income from conservation despite their involvement in cultivation, but the rents received are considerably lower (median \$62/yr) than for those in the livestock/ wildlife cluster

Determinants of income: factors influencing poverty

Longido Maasai are poor relative to their neighbours in Kenya, although the cost of basic necessities (grain, school fees, etc.) is lower in Tanzania. The average gross annual income across all households in Longido was just \$809 (8.9 AU), with mean livestock holdings of 4.2TLU/AE. This figure includes the value of livestock and crops consumed within the household as well as those sold, and works out at considerably less than the international poverty datum line of \$1/person/day. It compares poorly to a mean gross annual income of \$2495 (7.4 AE) with 12.8 TLU/AE in Mara. In both areas, these means are inflated by a few very wealthy households, and median values for both study areas are much lower, as the distribution of income and assets are highly skewed. In Longido, the clusters group households by wealth as well as by livelihood strategies. In Mara only the livestock/wage earner cluster have near-significantly lower mean and median annual income than the others, while the livestock/wildlife cluster have (non-significantly) highest incomes and holdings.

Opportunities are limited in Longido but necessity has driven diversification nonetheless. On average, 43% of Longido household income came from livestock and livestock products; 22% came from agriculture and 34% from wages or salaries. By contrast in Mara around 70% household income overall comes from livestock for the great majority of households (95%), with two-thirds of households deriving on average a further 30% from petty trade and wage labour. Cultivation is significant for only a few Mara households (on average ca 22% gross income for ca 13% households). Around 50% all households in Mara earn wildlife income, averaging 14% total income for those involved. By comparison in Longido conservation income amounts to barely 1% of all income (0-4% depending on cluster) and is concentrated in fewer than 5% households. Regression analysis determined the extent to which a range of factors might influence wealth and conversely poverty, in terms of gross annual income/household.^{iv} Overall the models for Longido is significant, although accounts for only 39% of variation in income (F=9.01, df. 15,175, P<0.001). Similarly in Mara the regression model was a

^{iv} The number of cases in the Longido analysis was reduced by 25 to 204 households due to missing data in any one of the variables in the analysis. Backwards regression was used so as to retain factors that might have been lost from a stepwise regression.

significant improvement to the null model, but there remained an important amount of unexplained variance in the residual error (Table 4).

Table 4: Significant determinants of income, Longido and Mara (multinomial regression)

| | Longido | | | | Mara | | | |
|--|-----------------------|--------------|-------------------|-------------|---------------|----------------|---------------|--------------------------|
| | Estimate ^v | S.E. | T | Sig. | Estimate | S. E. | T | Sig. |
| Constant | 5.238 | 1.493 | 3.51 | .001 | 71.390 | 11.095 | 6.43 | .000 |
| Household size | | | | | 0.0306 | 0.0162 | 1.89 | .061 |
| CVNDVI | -0.132 | 0.051 | - 2.585 | .011 | | -0.3321 | 0.1206 | - 2.75 .007 |
| Distance to major town | 0.038 | 0.021 | 1.851 | .066 | | | | |
| % income from livestock | 0.265 | 0.048 | 5.485 | .000 | | | | |
| Total number of off-land activities | 0.591 | 0.12 | 4.942 | .000 | | | | |
| Livestock holdings (LnTLU) | | | | | 0.2920 | 0.04439 | 6.58 | .000 |
| Wildlife density (LnWLTLU) | | | | | 0.1404 | 0.04634 | 3.03 | .003 |
| Livestock density (LnLSTLU) | | | | | 0.1067 | 0.04021 | 2.65 | .009 |

For Longido, the proportion of income derived from livestock and the number of activities a household is engaged in (a crude measure of diversification) emerge as the strongest and most significant predictors of income overall and of poverty in particular. The greater the proportion of gross income from livestock, and the greater the number of off-land activities the wealthier the household. For Mara, the main predictor of income emerges as livestock holdings. Both these results confirm just how much Maasai still rely on pastoralism and, for Longido, the prediction that better-off households are diversifying to successfully buffer risk and spread investment, alongside poor households diversifying out of necessity. Other socio-economic factors were less clearly associated with income. Smaller household size (lower AE) was a near-significant determinant of lower incomes in Mara ($p<0.06$), while education levels were not significant in either site.

In both areas, the agro-climatic potential of the immediate surroundings of the homestead is significantly associated with income. Households living in an area with a large variability in NDVI, generated significantly less income than households living in an area with less variability in NDVI. Other spatial factors played out in different ways in the two areas. Distance to a major town is near-significant predictor of income in Longido: Income is weakly but positively correlated with distance from town, suggesting that in Longido, poorer households were more likely to be located near a settlement.

In Mara, rather different spatial relations emerge. Households living in areas with lower densities in wildlife, and/or livestock were likely to generate less income. These variables are effectively proxies for the livestock ranching and conservation potential of a given area. High wildlife densities increase the conservation potential and thus the chances for a Mara household to derive income from conservation. We do not have exactly comparable density data for the Longido area, but there are extremely low levels of income from conservation in Longido under current circumstances. The very

^v Unstandardised Beta Co-efficient

poorest villages and households were those that reported high densities of elephant and other wildlife, and had experienced such severe crop damage as to make villagers abandon attempts at cultivation.

In Mara, each resident household nominally received 100-150 acres at group ranch subdivision, and people have manoeuvred to consolidate far larger family holdings. Involvement in small-scale cultivation or private land ownership did not emerge as influencing gross annual income in Mara, though earlier analyses have shown clear links between wealth and land ownership across a wider (multi-ethnic) sample of Mara and the adjacent in-migrant enclave areas of Sikrar and Emarti (Homewood et al 2004).

Land tenure and access in Tanzania Maasailand is very different from the Kenya situation. Two-thirds (67%) of Longido households cultivated (cf 20% in Mara), all of these being primarily smallholder cultivation. On the face of it, Longido households display little differentiation in terms of household access to cultivable land. However, looking beyond the regression analyses, this apparent uniformity masks significant differentiation. In Longido, the total number of livestock (TLU) per household is strongly correlated with total (log transformed) acreage (combining upland and lowland plots). When leadership roles are taken into account, the mean area of lowland cultivated by leader/gatekeepers is higher than that of non-gatekeepers, but not significantly so. However, access to high value farmland, including upland, is strongly differentiated. The only two sample households cultivating irrigated land in Longido were both gatekeeper households, and the area of upland cultivated by gatekeeper households was more than two times that for non-gatekeeper families (1.30ha compared to 0.57 ha, $t = -3.4$, 94df, $P < 0.001$).

Out of the land-use strategy clusters in Mara, only the livestock/ wage earners had near-significantly lower incomes than households in other clusters ($p < 0.06$). The regression results suggest no one land use strategy guarantees higher incomes than any other in Mara. Each of the land use strategies encompasses a wide range of variation in incomes and is also spatially dispersed across the whole area. The secondary factors associated with income in Mara are wildlife densities, variability of NDVI, and livestock densities, all of which denote agro ecological and ultimately productive/income generating potential of a household's site location. Comparable biomass density data are not available for Longido.

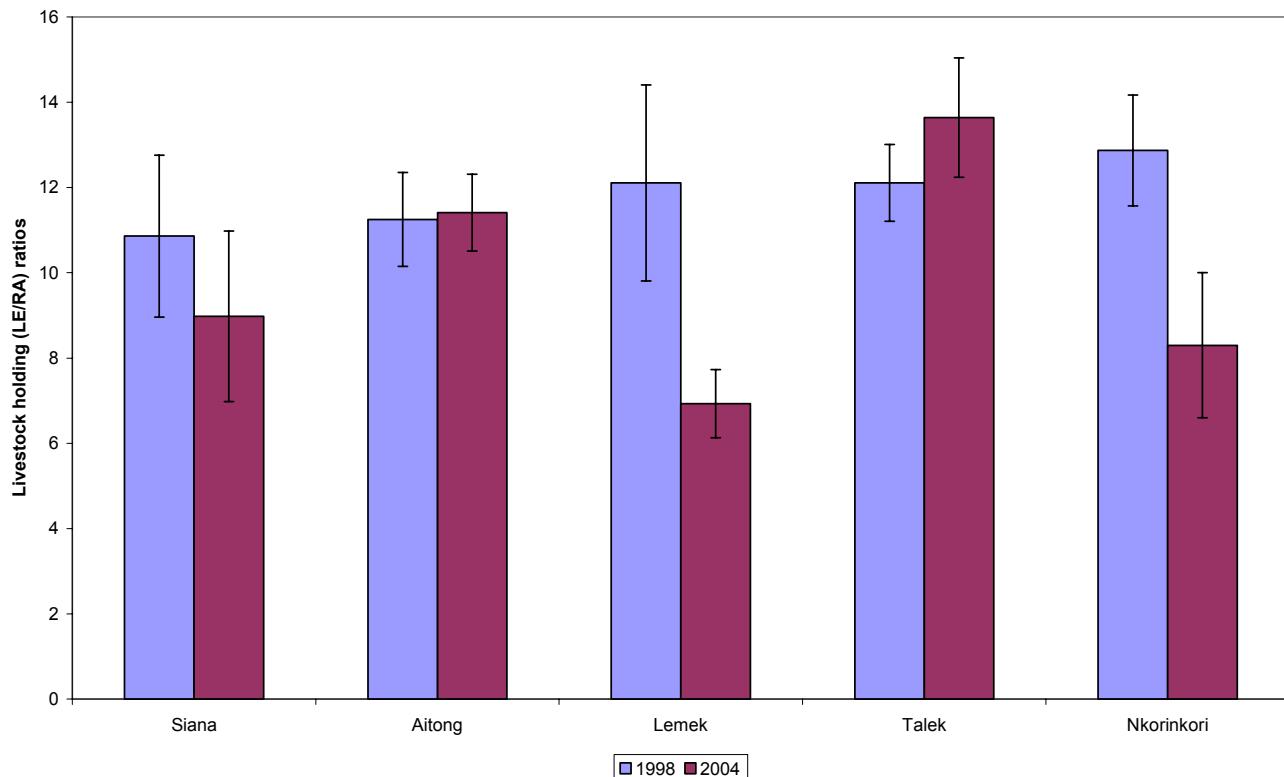
Change through time: Mara, 1998-2004

Mara households average relatively high livestock holdings, but trends in livestock per person (LE:RA)^{vi} from 1998/2000 to 2004 show a decrease at Lemek Centre where LE:RA declined from 12.11 in 1998-2000 to 6.93 in 2004, (Mann Whitney, $n_1=52$, $n_2=44$, $U=853$, $Z=-2.14$, $p = .032$) and at Nkorinkori where LE:RA declined from 12.87 in 1998-2000 to 8.30 in 2004, ($n_1=55$, $n_2=52$, $U=1092.5$, $Z=-2.10$, $p = .035$), (see table 6.1). However, the mean figures presented here need to be interpreted with caution. They mask large differences between the livestock rich and the livestock poor.

^{vi} The TLU measure is based on data collected amongst Maasai herds and flock in Kajiado District Kenya by the International Livestock Research Institute (ILRI), each TLU is equivalent to 250 kg, based on the herd and flock structures studies. On average 1 head of cattle = 0.71 TLU and 1 head of sheep or goats = 0.17 TLU (Grandin, et al, 1988). RA equivalents are adult male = 1, adult female = 0.86, children 0-5 = 0.52, children 6-10 = 0.85, male child 11-15 = 0.96, female child 11-15 = 0.86, (Little, 1980). By contrast Livestock Equivalents (Bekure 1991) are derived by multiplying total cattle numbers by 0.71, and total small stock numbers by 0.17 (Grandin et al 1988) Because of the way in which the Mara longitudinal data were collected, conversion to TLU/AE is not straightforward, hence LE/RA are used here.

Lemek and Nkorinkori are the two sites on the former group ranch (Lemek) that have been privatised the longest. The human population of these sites may have increased as households moved to new land holdings. Over the years preceding and since privatisation however, there has been a gradual move of households, which would have peaked around 2000-2001, and which might have been expected to be associated with an increase in household human population in the years to 2004. Another interpretation would suggest an association between privatisation and reduced livestock holdings which would match much contemporary literature on trends in TLU:RA being predominantly downwards (e.g. McCabe 1997, Reid and Lamprey, 2003). Intuitively, if human populations continue to expand rapidly (Coast, 2000), and overall herds remain constant in size, (or even reduce as land privatisation reduces the land available for keeping large herds), then we would expect TLU:RA ratios to decline. This may be happening at Lemek Centre and Nkorinkori. Assuming livestock numbers are unlikely to undergo a long-term increase, this trend can be expected to continue unless or until Maasai household organisation changes or rates of population increase start to fall. At the same time, trends in wealth show progressive concentration of livestock wealth in fewer hands (Graham, 1998; Homewood, 1992).

Fig 4: **Livestock holding (LE/RA) ratios (mean and s.e.) by Mara study site, 1998-2004.**

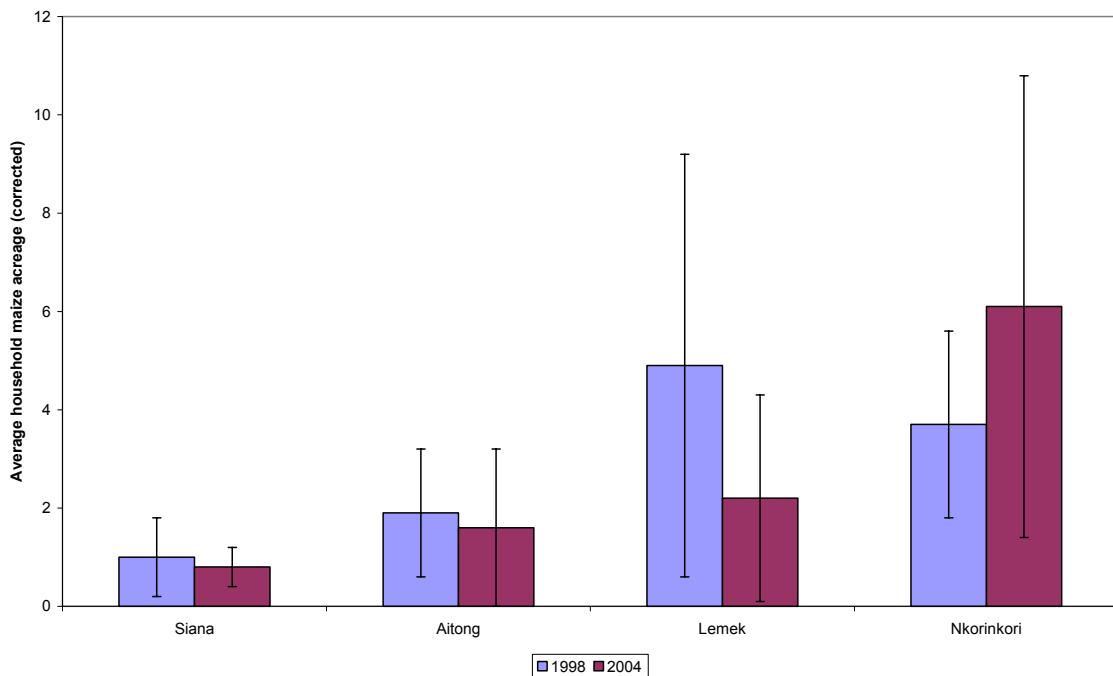


The top 20% livestock rich households have continued to accrue greater wealth. In 1998/2000 the top 20% livestock owning households owned between 43% and 57 % of TLUs. At this time Nkorinkori showing the least differentiation between richest and poorest and Lemek Centre the greatest. In 2004, at Siana and Nkorinkori the percentage of livestock wealth held by the top 20% of livestock owning households had increased further^{vii}. In 2004 in each study site the percentage of the overall herd held

^{vii} At Nkorinkori and Lemek Centre the lowest 50 % owning households have increased the percentage of overall herds held

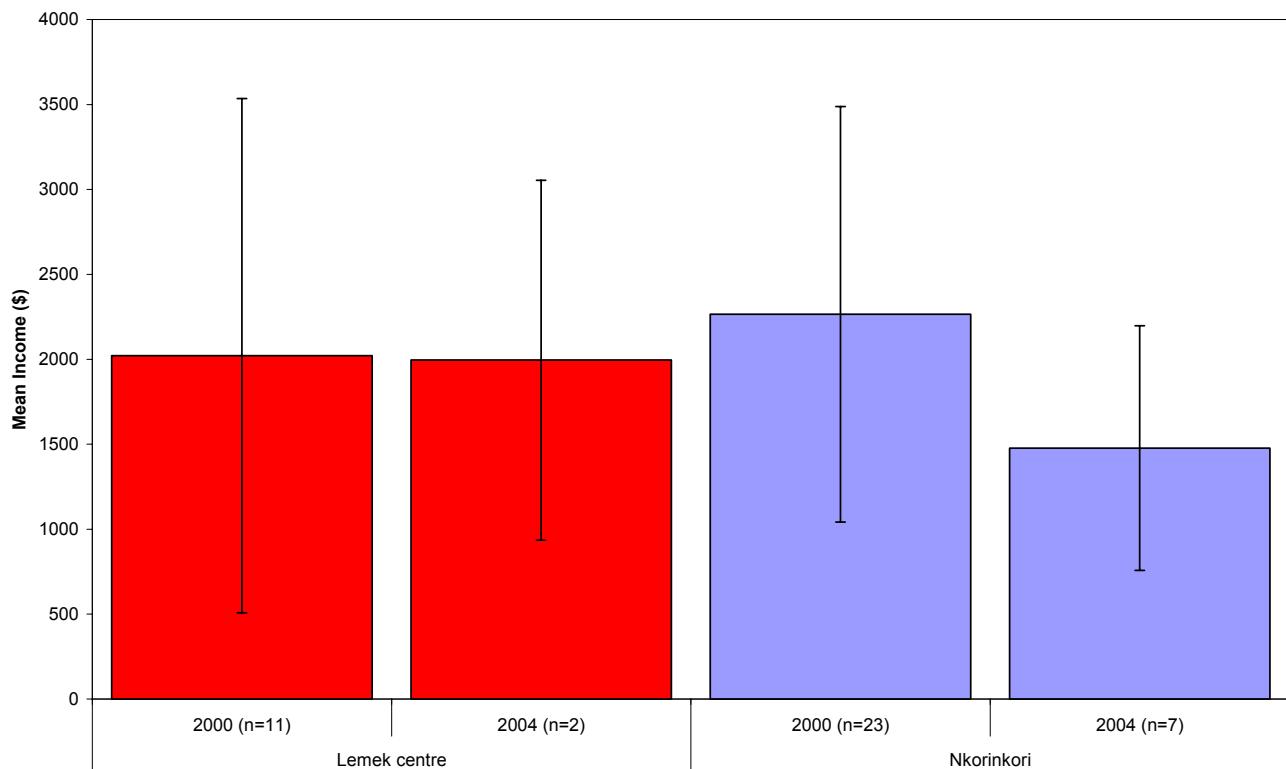
by these households had increased, while at Siana, Aitong and Talek the holdings of the lower 50% of livestock owning households had decreased markedly.

Fig 5: Average household Maize acreage, 1998-2004



Both the numbers of households involved in cultivation and the average acreages cultivated have changed considerably since 1998. In 2004 in all Mara sub-sites, fewer households cultivated their own fields than in 1998. Talek remains a largely pastoral area, its proximity to the park, competition from wildlife, and the reliance on income from the tourism industry, result in no households cultivating there. At Lemek elephant damage is greatly discouraging cultivation, numbers of households cultivating are down, as are sizes of fields, yields, and the months of the year that harvests feed the household. The number of people cultivating at Nkorinkori has halved, but field sizes doubled. Koiyaki and Megwara have not seen large changes in field sizes, but the number of people cultivating has declined in both areas.

Fig 6: Leasing land for mechanised wheat farming 2000-4

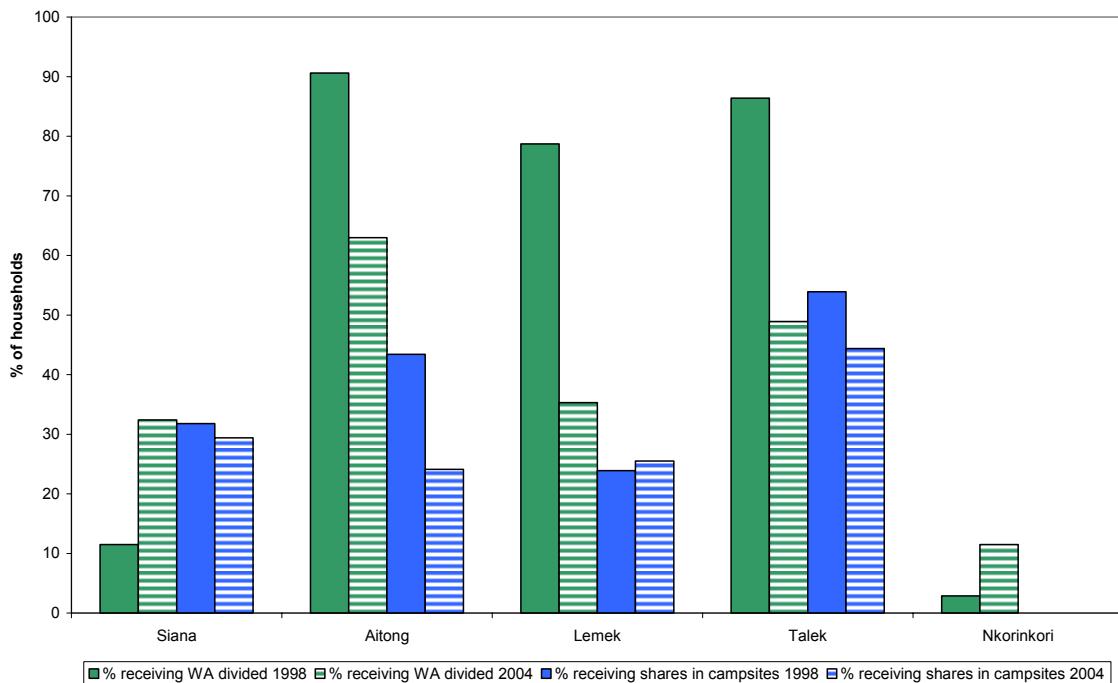


Since 1998, the percentage of households leasing land out for cultivation has dropped (from 23.9 % to 3.9 % at Lemeck centre and from 90.3 % to 26.9% at Nkorinkori). This is probably due to land subdivision as contractors could originally negotiate leases with only one or two spokespersons (typically the area chief and councillor) over large areas of group ranch land. Now, they have to negotiate with many individual land-holders. Once again, what was a significant and widely distributed source of income has been concentrated in fewer hands.

Trends in conservation income

The history of wildlife associations and tourism related activities in the Mara region is dynamic and contentious. The percentage of households deriving income from tourism fell between 1999 and 2004 (Fig. 7).

Fig. 7: Percentage distribution of Mara households receiving income from tourism-related activities, 1998-2004



In Koiyaki GR and at Lemek Centre, the numbers of people benefiting from wildlife association dividends has fallen sharply. At the same time the value of the dividends paid to households has increased, with the three year average annual income (2001-2003) being \$117, compared to \$74 in 2000. Dividends from members of wildlife associations increased at Siana where a wildlife association was newly formed in 2001^{viii}. At Nkorinkori, dividends from associations remain available to only a few households. The average income from rents from campsites over the years 2001/3 was down compared to 1998/2000 (\$158 and \$663, respectively). 2004 data do not show the big dividends paid to the few “elites” as recorded in the earlier surveys- partly due to constraints on survey sample, and partly due to declining tourism income received from 2001 onwards. The original Koiyaki-Lemek wildlife association has fragmented into five sub-set associations each with 10 –15 board members, and 2004 data show fewer members getting an increased dividend. This is consistent with the trend observed in 1999, whereby more members of the wildlife associations are gradually excluded, leaving a greater dividend for those that remain in the association.

Discussion

This discussion firstly relates the findings to the hypotheses. Secondly it draws comparisons between the study areas. Finally, it examines the implications for pastoral development policy and practice.

Poor pastoralists eventually cease to be pastoralists as they lose access to livestock and key resources of grazing and water. The study of poverty in pastoralist societies therefore becomes the study of diversification away from pastoralism. The process of diversification encompasses well-off as well as poor families, as better off households seek to balance risks, buffer shocks and spread investments across a wider portfolio. Our first hypothesis predicted that livelihood diversification for Maasai pastoralists should demonstrate close parallels with the broader process of rural livelihoods diversification taking place across sub-Saharan Africa^{3242,20}, in terms of three dimensions. These are

^{viii} In 2000 no association existed - any members shown as receiving a dividend then were registered on the neighboring Koiyaki Wildlife Association

changing economic occupation/activities; changing main sources of income; changing location or residence. A fourth dimension, of changing social identity and aspirations is not dealt with in this paper, though it is clear from ethnographic³⁸ and development⁴⁵ work that pastoralist identities and aspirations shift with diversification, even while other elements of pastoral culture are strongly retained³⁹.

In both Kenya and Tanzania, across a range of study sites, livelihoods remain strongly focused on pastoralism, with 100% of Mara households, 98% of Narok/Kajiado households, 95% of Longido households and 98% Ngorongoro households having some livestock. Livestock remain the main source of income overall in all areas. However, Longido is much poorer, as evidenced by mean household and per capita incomes being less than one-quarter, and mean TLU/AU less than one-third, of those in Mara.

Our first hypothesis suggests that the poorer the pastoralist household the more likely it is to rely on sources of income other than livestock. This is borne out by the cross-border comparison between the Mara and Longido sites, with livestock contributing 70% gross mean annual income overall in wealthier Mara as opposed to 43% in poorer Longido. It is also borne out by within-site analyses, which demonstrate that the proportion of gross income derived from livestock (in Longido) and the scale of livestock holdings (in Mara), is respectively the single most important predictor of income in each case.

Despite the enduring importance of livestock, and as suggested by the wider literature on rural diversification, the patterns of livelihoods activities observed in our Maasai study areas show that other activities have come to form an important part of households livelihoods strategies. This is the case for all sites. In Narok/Kajiado and Ngorongoro, 74% and 90% of households report livelihood strategies other than pastoralism. Livelihood diversification is most marked in the poorer clusters in Longido and Mara. Apart from pure pastoralist households, all clusters in Mara averaged 75-80% income from livestock, except for one cluster (livestock/wage) which averaged 50% income from livestock and 50% from non farm activities. Livestock form the primary source of income for fewer than half all households in Longido. Here, four out of seven livelihoods clusters, and 132 out of 229 households on average gained less than half their income from livestock. In the case of upland agropastoralists (n=70) less than 1/4 of income on average came from livestock, with 46% coming from cultivation and nearly 1/3 from non-farm activities. In the case of wage-earner households (n=29), and the very poor (n=8), 93% and 100% income respectively came from non-farm activities. It can be inferred that alternative activities in Longido do not provide an alternative source of cash of equivalent value to livestock, and wealth still correlates to livestock income.

Based on the wider literature, our hypothesis suggests that location changes with diversification, as new activities require new patterns of residence. The regression analysis shows a positive relation between wealth and distance to settlement in Longido. Elsewhere⁴⁰ we show that poorer livelihood clusters in Longido are more likely to be found closer to towns. Clusters doing moderately well from farming or livestock are more likely to be at a greater distance from settlements and well-off agropastoralists tend to be near all-weather roads.

A further prediction suggested by the broader literature is that both poor and wealthy diversify, with the poor diversifying into unskilled, low-status activities with low returns, and little or no job security, while the better-off diversify into skilled, individually specialised work that commands secure, well-paid jobs ensuring a diverse and complementary portfolio⁴² for the household. While cluster analysis identified a reference group of undiversified pastoralists in each area, the best-off on average in

Longido were the cluster of diversified agropastoralists who derive around half their income from livestock and the rest of their income from crops and non-farm activities. In Mara, the livestock/wage-earner cluster is significantly less well-off than the rest, but the general prediction of diversification across the wealth spectrum is strongly borne out by the fact that median gross annual incomes are comparable for all the other clusters, that each of these clusters contains a wide range of incomes, and that (other than the pure pastoralists) all these clusters get 20-25% of their annual income from sources other than livestock. The highest earning cluster in Mara on average were those able to combine livestock with conservation returns (and in some cases land leasing).

The further corollary of this prediction, that the poor diversify into unskilled, low-status activities with low returns, and little or no job security, is borne out by Longido data which differentiate between the types of non-farm activities open to (and taken up by) poorer as opposed to better-off households. Poor households are most likely to have members working as casual labourers (very insecure, mostly unskilled, poorly paid, unpredictable, \$27-\$162 p.a.) and/or watchmen (unskilled, low returns, regular, \$108-\$243p.a.). The very poorest Longido households are effectively destitute, and fail to diversify even into wage work. Any income that they receive comes from remittances. This suggests firstly that the very poorest are unable to get work, because they lack even the social capital which might give them openings. Secondly, it may be that, unlike well-off households which develop multi-local bases retaining some shared identity, individuals leaving the poorest households to find wage work elsewhere are effectively no longer household members, even when they send occasional remittances. The patterns here bear out the prediction that the poorer the household, the lower-return and less secure the jobs available. By contrast comparatively better-off agropastoralist households, as well as those still able to support themselves in pastoralism (though not well-off) are more likely to have members in relatively secure and better-paid employment as teachers and government staff.

The wider literature also predicts that better-off households develop multi-local urban/rural households, giving individuals an urban base to seek jobs, education and health services, and a rural home base (particularly for young children and old folk) where the household can buffer shocks in the prices of food and other commodities, through cultivation and livestock as well as free access to gathered resources of fuel, fibre, and construction materials. As a corollary, pastoralist households are expected where possible to develop multi-local rural/rural bases in different agro-ecological environments, suited to agricultural and pastoral land use respectively. While these connections are not well sampled or documented by the data presented here, family portrait case studies associated with the main quantitative study demonstrated these processes clearly at work**Error! Bookmark not defined.**

Our second major hypothesis, suggested by the broader literature is that within pastoralist groups, pressures on access to key resources including cultivable land result in an accelerating differentiation. Increasingly, the defining characteristic of the pastoralist and agropastoralist is possession of (or negotiated access to) enough land, of good enough potential, to be able to manage livestock and crops under changing seasonal and inter-annual fluctuations. Poorer individuals and households are likely to be pushed permanently out of pastoralism. This process of differentiation is very clear in earlier Mara data and analyses on the links between ethnicity, wealth and land access in a broader sample encompassing in migrant enclave areas as well as former group ranches adjacent to MMNR²⁸. It is also borne out by the Longido sample, which shows that even in a system where land allocation is supposedly rather equitable there are clear differentials in amount and quality of land available to better-off as opposed to poorer households, and that those differentials are further exacerbated by labour constraints. The very poorest are unable to cultivate land for themselves, are unlikely to get work even as casual wage labour, and are effectively dependent on remittances or food aid.

A further dimension of this hypothesis illustrates the process of progressive differentiation, as evidenced by the diachronic analysis of Mara baseline and follow-up data. In this relatively better-off community, livestock holdings, cultivation opportunities and conservation revenues all underwent rapid progressive concentration into the hands of better off households in the short but intensively dynamic period 1998-2004 subsequent to land subdivision and allocation.

These patterns bear out the expectation that the poorest diversify by necessity, not so much by strategy as through a downward spiral of progressive loss of access. Better off households by contrast are likely to diversify for risk management, and the wealthiest diversify as a means of investing wealth for profit maximisation. Finally, the presence of high-earning wildlife resources should create special opportunities for Maasai outside pastoralism. The comparable data for 1988 for Narok/Kajiado and Ngorongoro show that 12% and 17% of households report some involvement in tourism activities. In Longido, conservation income is negligible and limited to less than 5% of households. Mara is the highest-earning conservation area in Kenya and offers considerable opportunities for the well-placed. However, those opportunities are subject to rapid differentiation and wealth related to conservation is becoming increasingly concentrated in the hands of a few⁴¹.

As a result of the processes taking place in these areas, poor individuals and households are losing access to the land, livestock and labour central to pastoral and agropastoral livelihoods. The poorer household clusters show a wide range of occupations, typically sporadic, insecure, unskilled and low paid⁴². These people may resort to gathering honey and plant medicines for sale, brewing and selling beer, gathering and selling firewood, making and selling charcoal, hiring out their labour for farm or construction work. Though some find such casual labour locally, most young Maasai men with little prospect of a pastoral livelihood migrate out to find risky, poorly paid, unskilled, casual work as night watchmen and miners^{43, 44}.

Pastoralists on the margins may be poorly qualified to engage in diversified livelihoods. A combination of lack of familiarity with the national language, low literacy/educational qualifications, and powerful cultural divides, make livelihoods at the margin particularly precarious for pastoralists. Increasingly they cease to be pastoralists – “the poor are not us” **Error! Bookmark not defined.** These people who have lost their footing in the pastoral system may have aspirations to re-establish themselves as herding families, or may prefer to see their children’s future as outside pastoralism, because the only alternative is insecure, poorly paid work as a hired herder⁴⁵.

Impoverishment in general, and privatisation and enclosure of the rangelands in particular, are driving a massive cultural and economic shift. While the privatization process is already far advanced in some parts of Kenya Maasailand, elsewhere it is still being played out. The process is only just getting underway in Longido, where it is brought to a head by the setting aside of large areas of the land of several villages as Enduimet Wildlife Management Area. There are concerns that the interplay of international conservation with large scale commercial enterprise and State interests drive progressive enclosure of key resources for extraction on the one hand and for environmental mitigation and conservation set aside on the other⁴⁶. Though literacy, and a wider understanding of human and civil rights, may be making people more aware not only of the risk of dispossession but of the possible ways to combat it, the political economy of land and the scramble to control key resources of fertile soil, permanent water, and potential tourist campsites make this a pressure that can only be contained, not removed.

¹ Spear T. & Waller R. Ed. (1993). *Being Maasai*. London, Dar es Salaam, Nairobi, Athens. James Currey, Mkuki na Nyota EAEP.

² Waller R 1999 Pastoral poverty in historical perspective pp20-49 in Anderson D and V Broch-Due *The poor are not us*. James Currey

³ Lane C 1996 *Pastures lost: Barabaig economy, resource tenure, and the alienation of their land in Tanzania*. Nairobi: Initiatives publishers

⁴ Bonfiglioli AM 1992 *Pastoralists at a crossroads: survival and development, issues in African pastoralism*. Nomadic pastoralists in Africa project (NOPA) UNICEF, UNSO, Nairobi

⁵ Galaty J.G. & P. Bonte. 1992. *Herders, Warriors and Traders. Pastoralism in Africa*. Westview Press

⁶ Brockington, D. 2002. *Fortress Conservation: the preservation of the Mkomazi Game reserve, Tanzania*. James Currey, Oxford

⁷ Toulmin, C. and J. Quan Eds. 2000. *Evolving land rights, policy and tenure in Africa*. IIED, London

⁸ Homewood K 2004 Policy, Environment and development in African rangelands. *Environmental Science and Policy* 7, , 125-143

⁹ Markakis J 1993 (ed) *Conflict and the decline of pastoralism in the Horn of Africa*. Macmillan

¹⁰ Hogg R. (1986). The New Pastoralism: Poverty and Dependency in North Kenya. *Africa*. 56:317-333.

¹¹ Hogg R. (1987). Development in Kenya: Drought, Desertification and Food Scarcity. *African Affairs*. 86:47-58.

¹² Hogg R 1991 Should pastoralism continue as a way of life? *Disasters* 16, 131-7

¹³ Galaty, J.G. & P. Bonte. 1992. *Herders, Warriors and Traders. Pastoralism in Africa*. Westview Press

¹⁴ Little P 2003 Somalia: economy without State. James Currey, Oxford

¹⁵ Little P, K Smith, B. Cellarius, D. Coppock and C. Barrett 2001 Avoiding disaster: diversification and risk management among East African herders. *Development and Change* 32: 410-433

¹⁶ Baxter P. & Hogg R. 1990 *Property, poverty and people: changing rights in property and problems of pastoral development* Dept of Social Anthropology and International Development.University of Manchester

¹⁷ Fratkin Elliot; Roth Eric Abella; Nathan Martha A. (1999) When nomads settle: The Effects of Commoditization, Nutritional Change and Formal Education on Ariaal and Rendille Pastoralists *Current Anthropology* 40(5) 729-735

¹⁸ Fratkin E. and Smith K. 1995 Women's changing economic roles with pastoral sedentarisation: varying strategies in alternate Rendille communities *Human Ecology* 25, 433-453

¹⁹ Fratkin E 2001 East African pastoralism in transition: Maasai, Boran and Rendille Cases. *African Studies Review* 44 (93), 1-25

²⁰ Fratkin E., Roth E., M. Nathan (2005) *As Pastoralists Settle: Social, Economic, and Health Consequences of Pastoral Sedentarization in Northern Kenya* (Kluwer/Plenum)

²¹ Igoe, J. and Brockington, D. 1999. 'Pastoral land tenure and community conservation in East African rangelands: a case study from northeastern Tanzania'. *Pastoral Land Tenure Series* 11. IIED, London

²² Rutten, M. 1992. *Selling wealth to buy poverty. The process of individualization of land ownership among Maasai pastoralists of Kajiado District*. Verlag Breitenbach, Germany

²³ Galaty, J. 1999 'Grounding pastoralists: law, politics and dispossession in East Africa' *Nomadic peoples* 3 2., 56-73

²⁴ Homewood, K, E. F. Lambin, E. Coast, A. Kariuki, I. Kikula, J. Kivelia, M. Said, S. Serneels, M. Thompson 2001. 'Long-term changes in Serengeti-Mara wildebeest and land cover: pastoralism, population or policies?' *Proc Nat Acad Sci.* 98 22., 12544-12549

²⁵ Southgate, C. and D. Hulme. 2000. 'Uncommon property: the scramble for wetland in southern Kenya.' In D.Hulme, P Woodhouse and H Bernstein (eds) *African enclosures? Social dynamics of land and water*. James Currey

²⁶ Coast, E. 2000. *Maasai Demography* Unpublished PhD University of London

²⁷ Coast, E. 2002. 'Maasai socio-economic conditions: cross-border comparison' *Human Ecology* 30 No. 1 pp.79-105

²⁸ Homewood K, Thompson M and Coast E (2004) In-Migrants And Exclusion: tenure, access and conflict in east African rangelands. *Africa* 74 (4), 567-610

²⁹ Klopp, J. 2001. "Ethnic clashes" and winning elections: the case of Kenya's electoral despotism.' *Can.J. Afr Studies* 35 3. 473-515

³⁰ Waller R 1999 Pastoral poverty in historical perspective pp20-49 in Anderson D and V Broch-Due *The poor are not us*. James Currey

³¹ Potkanski T 1999 Mutual assistance among the Ngorongoro Maasai pp 199-218 in Anderson D and V Broch Due *The poor are not us*. James Currey

³² Bryceson, D.F. and Jamal, V. 1997. *Farewell to Farms. De-agrarianisation and employment in Africa*. Ashgate, Aldershot.

³³ K.Homewood, M Thompson, P. Trench, S.Kiruswa and E. Coast (in press) Community- and State-based natural resource management and local livelihoods in Maasailand . Special issue on Community based Natural Resource management. *Afriche e Orienti*.

³⁴ Coast, E. 2002. 'Maasai socio-economic conditions: cross-border comparison' *Human Ecology* 30 No. 1 pp.79-105

³⁵ Thompson, M. 2002. *Livestock, cultivation and tourism: Livelihood choices and conservation in Maasai Mara buffer zones* Unpublished PhD thesis. Anthropology, University of London

³⁶ Homewood,K.,Trench, P, Kiruswa S in prep *Longido*. In K Homewood, P Kristjansen and P Trench *Land use and Livelihoods Change in Maasailand*

³⁷ Coast, E, *In press*, "Local understandings of, and responses to, HIV: Rural–urban migrants in Tanzania" *Social Science and Medicine*

³⁸ Hodgson D (2001) *Once Intrepid Warriors: Gender, ethnicity and the cultural politics of Maasai development*. Bloomington IN: Indiana University Press

³⁹ Hutchinson S 1996 *Nuer dilemmas. Coping with money, war and the State* University of California Press

⁴⁰ Homewood,K., P Kristjansen and P Trench *Land use and Livelihoods Change in Maasailand*

⁴¹ Thompson M and Homewood K 2002 Elites, entrepreneurs and exclusion in Maasailand. *Human Ecology* 30 (1), 107-138

⁴² Iliya M. and K Swindell 1997 Winners and losers: household fortunes in the urban peripheries of Northern Nigeria. Chapter 5 pp 85-100 in D.Bryceson and V.Jamal *Farewell to farms. De-agrarianisation and employment in Africa*. Ashgate, Aldershot

⁴³ Coast, E, *In press*, "Local understandings of, and responses to, HIV: Rural–urban migrants in Tanzania" *Social Science and Medicine*

⁴⁴ May, A, and McCabe, J. T . 2004 City Work in a Time of AIDS: Maasai Labor Migration Africa Today, 51, 3-32

⁴⁵ Heffernan C., F Misturelli and L Nielsen 2001 *Restocking and poverty alleviation: the perceptions and realities of livestock-keeping among poor pastoralists in Kenya*. Veterinary Epidemiology and Economics Unit, Department of Agriculture, Reading.

⁴⁶ Homewood and Thompson (in press) Conservation areas as contested spaces. Occasional Paper, University of Copenhagen Geography Dept. Ed. DA Wardell