



Land Tenure Changes, Agricultural Productivity and Resource Conservation in Transmara Sub County, Kenya

Joseph O. Otieno

Department of Humanities and Social Sciences, University of Kabianga, Kericho, Kenya

Email: jotieno@kabianga.ac.ke

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Abstract

Land is a fundamental resource in the development process, especially in developing countries where land based extractive activities are the main basis of livelihoods in the rural areas. Land tenure is defined as a system of rights and institutions that govern ownership, access and use of land is critical in determining agricultural productivity and management of land-based resources. Understanding tenure systems and their effect on agricultural production is important in any country's efforts to achieve sustainable development. The study's objective was to look at how tenure changes in Transmara sub county from 1970's have affected agricultural production and resource conservation. The sub county has diverse agricultural systems with occasional conflicts based on competing land ownership claims. The study was conducted using a cross survey design with a multiplicity of data collection techniques that included administering questionnaires to sampled respondents, focus group discussions and key informant interviews in the sub county between 2011 and 2012. It also involved a review of secondary data on changes in land tenure systems, agricultural productivity and resource management. Data analysis was largely descriptive and meant to show the nature and trends in land ownership and its' impact on agricultural production and resource management. The findings of the research show that within the sub county land adjudication has led to ownership changing from group ranches to individual ownership leading to agricultural intensification in some parts of the county that includes cultivation of different crops and lesser role of livestock raising. The research also contributes to the literature gap by focusing on the dynamism of tenure systems from group ownership to private individual ownership.

Subject Areas

Geography

Keywords

Land Tenure, Agricultural Productivity, Resource Management

1. Background to the Problem

Land is an asset for billions of rural people around the world and the nature of rights to land vary greatly from one country to another. This variation is dependent on many factors that include the relative scarcity of land, the institutional and political contexts that define rights and access as well as the historical circumstances that shape ownership and access over time. In Kenya land is considered a fundamental resource and is the basis of livelihood directly and indirectly for a majority of Kenyans and the Constitution of Kenya 2010 has a whole chapter (chapter five) devoted to land and environmental issues [1].

There is a growing realization amongst policy makers and other stake holders in the land sector that understanding land tenure systems and the various rights they define is important for a country in its effort to achieve sustainable development. Consequently, there is a need to consider land policies with the aim of adopting tenure systems that promote security of tenure that would enable land users to feel secure enough to invest in land [2]. Kenya's national land policy notes that land ownership or tenure structures must not only address issues of tenure security but include equity, efficiency of resultant land use and long term ecological sustainable use of such land [3]. The policy also stresses that the country's land policy needs to enhance peace amongst the land using communities, promote harmony and national unity and contribute to poverty alleviation. The call for land users to promote peace is in recognition of the many land-based conflicts associated with access and control of land in the country between communities and individuals.

Secure tenure systems have been argued as a pre-condition for intensifying agricultural production and sustainable management of natural resources. The security of tenure is often equated with private ownership, either individually or in a corporate sense and having the rights to that piece of land registered under various pieces of legislation. Kenya has seen a decline in agricultural productivity, in comparison to the increase that were registered in the 1960's and 1970's partly due to declining farm sizes, land fragmentation and low uptake of agricultural technologies and inadequate agricultural infrastructure that would lead to increased productivity [4]-[6] The result of this decline in productivity has been increasing food shortages in parts of the country, occasional famines and hunger as well as deepening poverty levels amongst different segments of the Kenyan population.

In Transmara sub county in Narok County, the land question has been framed

more in terms of transiting land ownership from group ranches and the subsequent sub divisions to individual ownership accompanied by adjudication and titling. As a sub county, Transmara was considered as an agro-pastoral area and land was initially registered under the Group Ranches Act (1968). The problem today manifests itself as a contestation between different clans that have claims to same pieces of land or land-based conflicts between communities and individuals that claim ownership over a given area. These conflicts have arisen inspite the fact that the main objective of changes in tenure system undertaken in the sub county was meant to promote efficiency in land use, bring harmony between communities that would otherwise be feuding over land and provide a basis for sustainable land use and conservation [7].

The sub county's tenure system includes individual ownership, group ranches, public land and community owned or controlled land. These forms of ownership are often spaces for contestation by individuals and groups alike that lay claim to a given parcel of land based either on historical, heritage or legal basis.

2. Research Problem

This research was premised on the fact that declining agricultural productivity, increased food insecurity and land degradation that results from poor agricultural practices are often attributed to various factors without critically looking at how land ownership and access can be considered as determinate factors. The nature of land ownership determines land users' decisions on how to invest in land and its subsequent management which in turn affects overall agricultural productivity. Where tenure systems are unclear or lead to a sense of insecurity or "temporarieness", then investments on such land is limited as the owners are not sure whether they will still be on the same land to gain benefits from their investments. Where claims to land tend to overlap and transactions on land may be backed by legal or statutory powers that are not acceptable to the communities or parties concerned then they may lead to land based conflicts. In the case of this study area, these conflicts may involve people from different clans or communities who may have different livelihood systems and often may take an ethnic dimension as often reported in local print and electronic media in Kenya.

Some scholars have argued that in order to increase agricultural productivity and ensure long term environmental conservation of land in Africa, there is need to transform customary or indigenous systems of land ownership or rights to private holdings with titles. Such titles do not only act as proof of ownership but are meant to entrench security of ownership and make land be considered as an asset that can be transacted in an evolving land market. Land registration and titling are meant to encourage landowners to undertake long-term investments in land, secure credit to improve agricultural production and adopt sustainable management systems. It helps to allay the fear or doubts that the individual will relinquish their claims over such land after some time. The counter arguments against individualization of land ownership from predominantly customary based systems is

that while it tends to address productivity issues of land, it does so at the expense of equity often leading to landlessness and social tensions.

It is important to note that tenure structures, including those based on customary rights or even those based on statutory rights, have neither been static nor exclusive. Claims to land based on customary or community rights often overlap with statutory tenure systems. The tenure systems therefore overlap, especially in areas where land adjudication is incomplete [8]. Governments have at times laid claim and exercised control over land that is often classified as communal. Similarly land that was previously classified as government land has been alienated in some parts and allocated to individuals. Community held lands have also been sub-divided in some cases to create individual titles (as the case of group ranches), while individual held lands have seen changes associated with selling and buying of land that makes what was land inherited as part of one's lineage move to members from other areas/communities. These changes have resulted in cases of multiple or overlapping claims to land or land-based resources that are in many cases not tackled by individualizing land titles. What is not clearly understood is the nature of these changes and their overall impacts. The impacts of these tenure changes and multiplicity of claims over land in terms of agricultural production, food security and environmental conservation in the study area form the basis of this research.

3. The Study Area

Trans Mara sub county is part of Narok county (formerly Narok District) and was set up as sub county (district at the time) in 1994. It borders Kisii county to the west, Migori County to the South and Kericho county to the north. It covers approximately 2932 square kilometers and at the time of the research had five administrative divisions, viz Kilgoris, Logorian, Pirrar, Keiyan and Kirindon. Politically the sub county has only one constituency (Kilgoris) [9]. The district had an estimated population of 209,537 in 2008, which had grown to 271,838 by 2019, a majority of whom were engaged in farming activities. [10]. Narok county has a population growth rate of 4.7% which is higher than the national average of 2.7% which creates pressure on available land resources, The relatively high population growth is exacerbated by migration of people to the county [11].

Figure 1 below is a map showing the study area.

The topography of the sub county is characterized by the highlands that rise to over 2000 meters above the sea level in the upper parts of Olokurto and Mulot to lowlands that range from 900 meters above sea level to 1500 meters above the sea level. The highlands are the main source of the various permanent and seasonal rivers that traverse the districts. The major rivers that flow through the districts include the Mara that originates in the Mau ranges and flows through Kenya into Tanzania before emptying its waters into Lake Victoria, Ewaso Nyiro, Narok River and Siapai and their tributaries. The terrain allows for crop cultivation, especially in the highlands as well as livestock raising which is traditionally concentrated in the lowlands.

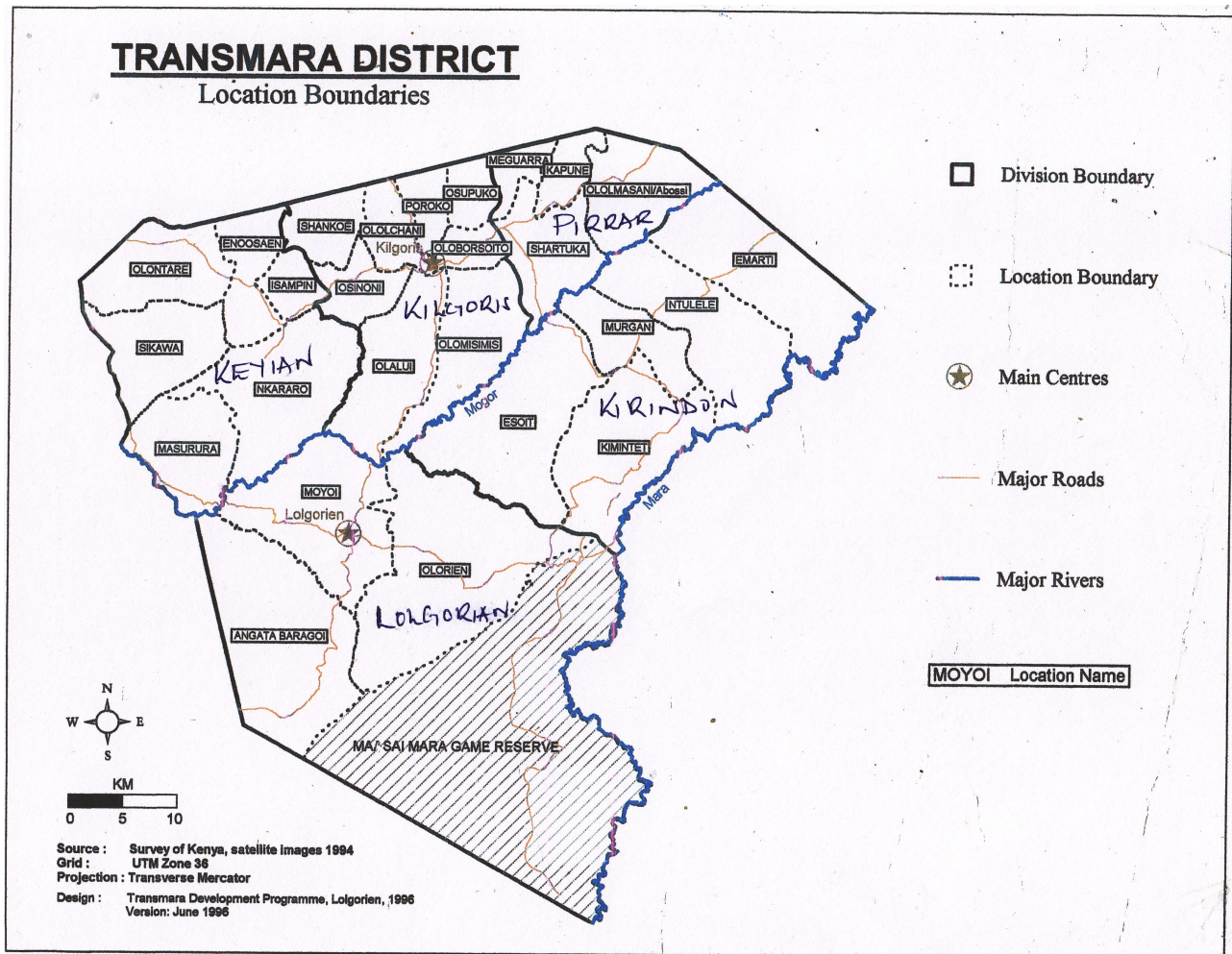


Figure 1. Study area.

The diversity of the topography and the passage of Inter-Tropical convergence zone in the district as well as breezes from Lake Victoria affect the climatic conditions within the area with rainfall distribution being uneven and bi-modal. The main elements of climate that are significant for various activities in Trans Mara are rainfall and temperatures. Annual rainfall averages range from 500 mm in the lowlands to 1800 mm in the highlands though there is great variability within the districts and temporally. The main wet season begins from mid-March to June. The temperatures within the region are generally cool and range from 10°C to 15°C.

The soils are diverse with the highlands having dominantly rich volcanic soils that are suitable for a variety of agricultural activities such as the cultivation of wheat, barley, maize, potatoes and beans. Most of the soils in the highland areas are well drained while the lowlands are characterized by black cotton soils that range from deep to very deep and in some cases marshlands. The lowlands are normally used for livestock raising although there is an increasing trend towards cultivation especially of wheat and maize in some parts of the districts [12].

The sub county has a diverse population with the Maasai people being the

majority, followed by the Kalenjin's (Kipsigis), the Kisii and other ethnic groups. Agro ecologically, most of Transmara is considered as high and medium potential that allows the cultivation of a variety of crops and livestock. Crops grown include maize, sugar cane, sweet potatoes

4. Existing Land Tenure and Land Use in the Sub County

The sub county has a history of land ownership that ranges from being communal to registered group ranches and eventual adjudication and titling for individual ownership [12]. There are also parts of the sub county where land is government owned and controlled as well as trust land under the county government at the time of the research, which reflects the constitutional principles and classification of land ownership in the country [1]. The changes in land tenure have led to increase in land subdivision and the development of land markets with unclear consequences on agricultural productivity and sustainable management of land resources. The reality of different forms of ownership has acted as spaces for contestation by individuals and groups alike that lay competing claims to a given parcel of land based either on historical facts, lineal heritage or legal basis. While communal land ownership was more dominant in the past and enabled the keeping of large herds of livestock under free range grazing, the recent changes have seen, crop cultivation being more pronounced in many parts of the sub county. Other forms of land use include areas designated for wildlife conservation and community forests.

The multiplicity of tenure systems that confer different levels of security to the landowners has posed a major challenge for agricultural production and overall resource conservation in the sub county. At the time of the research (2011), adjudication process and sub-division of group ranches had been completed in some divisions and still on going in others. Where adjudication had been completed the process of issuing individual land titles under freehold tenure systems was continuing, especially in Keiyan and Kilgoris divisions. The adjudicated land accounted for approximately 18% of the total land area. A majority of the remaining group ranches were found in Lolgorian, Kiridon, and Pirrar divisions. While adjudicated land where titles had been issued at the time of this research accounted for approximately 18% of the total land area [13].

The group ranches were established in the then Narok district as in other pastoral areas after the enactment of the Group Ranches Act in 1968 and were intended to not only prevent landlessness amongst the Maasai but also encourage improved communal services and increased productivity by promoting rational grazing and better disease control and control of herd sizes. The subdivision of group ranches, while providing the individual landowners with increased security of tenure and encourage investment and development of the land, it has at times led to subdivision of land to uneconomical levels, especially where livestock keeping is the main economic activity.

Other than gazetted forests and institutional land, government owned land is

limited. The increasing demand and pressure for land has seen the degazettement of some forest land for human settlements resulting in serious deforestation in some parts of the greater Mara ecosystem that has mainly been felt by those who live downstream.

The fragile nature of the ecosystem and the competing land uses in the area has meant that land use conflicts are increasing and that conservation measures are threatened by expansion in human activities within the larger Mara ecosystem. Managing these conflicts as well as preserving the unique Mara ecosystem means that tenure systems that caters for both medium and long-term developments must be promoted. In migration of communities who traditionally did not practice pastoralism has often led to conflicts between the pastoralists (“indigenous”) and the newly settled community of agriculturalists. Changing land ownership and access has its’ own political ecology that defines who really gains and losses when such changes occur and how it affects existing social and power relations in the community. These changing dynamics call for attention on the likely impact of such tenure changes and how the lessons learnt can be up scaled to national policy making levels.

5. Research Method and Data Collection

I undertook a pre-field visit in July 2010 and pre-tested the questionnaire in Poroko location in Kilgoris Division. Given the sensitivity of the land question, especially in the constitutional debate leading to the enactment of 2010, constitution, I was not able to proceed with data collection until after the promulgation of the constitution. Secondly the fieldwork research permit from National Council for Science and Technology (NACOSTI) was released in May 2011, which is a requirement in conducting field-based research in Kenya. The permit to conduct the research was extended to cover up to 2013.

The first phase in the data collection involved interviews with key informants who were in charge of agriculture and livestock production at the district, division and locational levels, provincial administration, land adjudication and registration officers, the district surveyor, Kenya Forestry Services, officers who were involved in the Arid Lands Management Project and Kenya Wildlife staff. These interviews were mainly done in the months of June and early July before administering questionnaires to sampled respondents.

The main finding from these discussions helped in refining the questionnaire and understanding some of the key issues facing land tenure changes and agricultural productivity in the district. It was observed that nearly the whole of the district was at one time under group ranches and the groups had been deregistered and individual titles issued in parts of Kilgoris Division. The process of deregistration of the groups was complete or ongoing in Lolgorian division and the adjudication process was still active so that few farmers had individual titles. It was noted that the district had less than ten percent of its’ land area under forests, most of it managed by the community through the county council so that most of the

conservation activities had to focus on the farm level.

The only division that had an active group ranch at the time of the research was Keiyan and arrangements were made to have focus group discussion with Keiyan farmers group.

I trained the research assistants who would administer the questionnaires and went through the pre-tested ones for clarity before embarking on data collection

The field work for data collection was conducted between July 18th 2011 to July 30th 2011.

6. The Sampling Framework

The population for the study consisted of individual landowners in the sub county, groups ranches, the local authority (county council in charge of trust land) and the central government. In drawing out the sampling framework, it was necessary to stratify respondents to include all these different categories of landowners and to interview them variously to ascertain changes in land tenure systems and impacts of such changes on agricultural production and resource conservation. Sampling had also to consider the diversity of agro-ecological zones and the proportionality in different tenure systems in the selected three divisions out of the five in the sub county.

Two of the five divisions, *i.e.* Kilgoris and Lolgorian were selected for purposes of administering questionnaires to individual farmers. While adjudication was ongoing in parts of Keiyan, division, it was selected for purposes of group discussions and interviews since it still had an active group ranch organization. After selecting the two divisions where data collection was to be undertaken, I randomly sampled locations and sub-locations where respondents would be selected for questionnaire interviews, Given the estimated population (Olorien 4500, Oleleko 6000, Oloimismis 5000 and Shankoe 4500) at the time, Lolgorian had the largest population, followed by Oloimismis and Shankoe, although the population density in Shankoe was the highest.

The sampling was random and systematic, with research assistants asked to select every fifth homestead in Lolgorian division where population densities were low and farm sizes were relatively large and every tenth homestead in Kilgoris division. Where the household head in a selected homestead was unwilling to participate in the research, then the questionnaire was administered to the net or adjoining home. A total of one hundred and fifty respondents were selected in the two divisions. Of these, 72% were male respondents and 28% were women.

Shankoe location was selected because it is considered as an ecologically high potential area where different farming activities that include mixed farming, dairy, sugarcane cultivation and maize growing were undertaken. At the time of the research land had already been adjudicated and registered in individual owner's name in the location. Agriculture activities in the location are generally intensive with farmers keeping livestock for both meat and dairy, cultivating a variety of crops that include maize, sunflower, tea, and sugar cane. The intensity of

agricultural activities was also evidenced by the fact that a number of farmers were keeping dairy cows under zero grazing and there were already proposals to put up a tea factory under Kenya Tea Development Agency (KTDA) in the location. At the time of the research, local agricultural extension officers were concerned with issues of food security since a number of farmers were growing or leasing their farms to those who wanted to grow sugar cane to supply the Transmara Sugar Company that had been established in Ensoo location. A total of forty five questionnaires were administered to the location.

Oloimismis location on the other hand was selected to represent the ecologically medium potential areas and at the time of the research, land adjudication process was on-going to change tenure from group ranch ownership to individual ownership. A sample of forty farmers were selected and identified for questionnaire administration. On the other hand, in Lolgorian division, two locations, Moyoi and Olorien, were selected to represent low potential areas and a total of forty questionnaires were administered in Moyoi location where land adjudication had just been completed in 2010 and still had active land disputes arising from the adjudication exercise. In Olorien location a total of thirty-six questionnaires were administered.

In Keiyan division, members who were engaged in group discussion pointed out that they wanted the adjudication and registration process to be hastened to allow individual farmers undertake sugar cane farming or lease part of their land to Mara Sugar Company that was establishing a mill in the division.

Table 1 below shows the distribution of respondents per location and sub location.

The demographics of the population were also varied with farmers' age ranging from twenty-seven to over 70 years in some locations. **Table 2** below illustrates the age variations amongst the respondents in Shankoe location.

Table 1. Sampled respondents per division and location.

| Division | Location | Sub Location | Male | Female | Total |
|--------------|------------|--------------|------------|-----------|------------|
| KILGORIS | Shankoe | Olereko | 15 | 0 | 15 |
| | | Shankoe | 12 | 3 | 15 |
| | | Emanyieny | 12 | 3 | 15 |
| | Oloimismis | Olesento | 10 | 5 | 15 |
| | | Oliomismis | 9 | 5 | 14 |
| LOLGORIAN | Olorien | Kawai | 8 | 10 | 18 |
| | | Olmongi | 12 | 6 | 18 |
| | Moyoi | Olmotonyi | 9 | 4 | 13 |
| | | Lolgorian | 10 | 3 | 13 |
| | | Olkisoito | 10 | 4 | 14 |
| Total | | | 107 | 43 | 150 |

Source: Field Data 2011.

Table 2. Age composition in Shankoe location.

| Age | Olereko | Emanyieny | Shankoe |
|---------|---------|-----------|---------|
| 20 - 30 | 1 | 1 | 0 |
| 31- 40 | 5 | 5 | 0 |
| 41 - 50 | 7 | 2 | 3 |
| 51 - 60 | 2 | 5 | 4 |
| >60 | 0 | 2 | 8 |

Source: Field Data 2011.

7. Research Findings

7.1. Occupation

A majority of respondents considered their main occupation as being agro-pastoralists (60%), 22% as farmers, 15% as pastoralists and the remaining 3% as others that included teachers, traders and religious leaders.

7.2. Land Ownership and Tenure Changes

A majority of the respondents (97%) had acquired their lands as part of inheritance from the original group ranches or as initial shareholders who were allocated shares. The others stated that they purchased their lands or were given as gifts by relatives. Land holding sizes were varied by location, being relatively small from 3 acres to 12 acres in Oleleko sub location in Shankoe, while in Moyoi individual land sizes ranged from 48 acres (which was equivalent to one share) up to 200 acres.

A key finding of the research is that there have been major changes in land tenure in the sub county and most of the registered group ranches were being subdivided to allow for adjudication and provision of individual titles to different land parcels. This process was, however, facing the challenge of leadership wrangles partly based on clan affinity and time of joining the group. Group members who were there at the initial registration of the group were demanding larger share and a greater say in how the land would be sub divided and allocated to members, especially those who joined the group ranches later on. There were also court cases filed and injunctions issued by different courts challenging the process in adjudication and titling in some parts of the sub county, especially in Oloimismis and Olorien locations. It was also observed that the emphasis on livestock keeping is often presumed rather than being reality on the ground. Many changes have and are taking place amongst the Maasai (dominant) community that has generally enabled a more tangible shift to crop cultivation even as livestock is still valued and within the study area, the move is more towards agro-pastoralism rather than pure pastoralism.

Many people (98%) viewed the changes in land tenure to individual ownership as being positive since it gave the land owner more freedom, security and control

over their parcels of land, arguing that this contributed to increased agricultural productivity and overall development of the region. The two percent who viewed the changes as negative argued that adjudication and titling had favoured the educated members and the leadership of the group ranches. A minority of respondents argued that while group ownership (communal tenure system) was not good for investments on land, it had the positive aspects, especially in managing community-based resources such as the need to protect water catchment areas, forests and wildlife corridors. Individual ownership, that translates to absolute ownership of freehold nature, tends to remove the community safeguards on these resources as individuals focus on maximizing their returns from their titled parcels [13]. Only four percent of respondents stated that they owned land elsewhere and this included land in urban areas and purchased agricultural land.

Land tenure changes were attributed to a number of factors. These factors ranged from pressure from increasing population, government decision to deregister and wind up the group ranches, influence from neighbouring communities who were largely farmers, increasing land conflicts amongst the group members and competition over land between groups as well as ease of land management.

It was also noted that the sub county has been sub-divided to create Transmara East and West districts, partly to accommodate the two main ethnic groups in the sub county (the Maasai and the Kipsigis) who at times have political tensions [12]. Adjudication had been progressive in Transmara West Divisions where 90% of land had already been adjudicated and titling was on going.

The adjudication process and sub divisions have led to notable inequality in land holding sizes. While it was not possible to establish actual acreages per sampled households as a majority had not collected their title deeds that would show exact acreages, field data estimates showed that the average holding in Shankoe location at the time of the research was 10 acres and around 15 acres in Oloimismis, which was in line with the county average holding size of 16 acres [11]. Land sizes were relatively larger in parts of Moyoi and Olorien locations in Lolgorian division where some respondents estimated their land sizes to be 200 acres or more. Those who had relatively large land holdings in the high and medium potential areas tended to lease them out to immigrant communities, especially the Kisii, Kikuyu, Kalenjin, Kuria communities who are traditionally cultivators.

While individual titles had been issued in some locations such as Shankoe, apparently it had not led to land market with 98% of the respondents indicating that they had not sold land. There were only 3 respondents (2%) who had sold land and their main reason for selling was to raise school fees for their children who were in secondary schools. Selling land was viewed as a way to entrench poverty and to disinherit their children. Land leasing was however quite common and 68% of respondents in Shankoe had leased their land for periods that from six months to one year at a cost of Kenya shillings eight thousand to Kenya shillings ten thousand. While leasing was fairly common, it faced challenges that include the fact that one could lease to multiple parties, fail to honour terms of the lease and even

conflicts when one had to harvest the crops.

Leasing was seen as not only profitable but flexible and still gives the land owner full control after the lease period that ranged from a year to five years for those who are cultivating sugar cane. In Shankoe, 90% of respondents valued farming but some pointed out that money from renting/leasing was quite attractive to many old people who may not have the resources to directly farm on their own. While most of the land had already been subdivided and people had a strong sense of individual ownership, few had collected their title deeds and no one amongst the respondents had used the issued title as a collateral to access credit from banks or other financial institutions. This finding tends to back the arguments of Pickney and Kimuyu in regard to using titles as collaterals to access credit [14].

Land sales were also limited by the fact that at the time of research, the Land Control Boards (LCB) that have to approve sale of freehold land (mainly in agricultural areas) were not operational in most of the divisions. Where land was being sold, the prices ranged from Kshs. 20,000 per acre in Moyoi location in Lolgorian division to a high of Kshs. 100,000 in Poroko and Pirrar areas in Kilgoris division, reflecting the emerging relative scarcity of land in the high potential locations where agricultural intensification was taking place. Influential or persons from prominent families had large tracts of land and in some cases in Kawai were establishing wildlife conservancies.

Transmara is considered to be food secure and at the time of the research was able to provide 200,000 tonnes of maize to the World Food Programme. The sub county's maize requirement at the time (2010-2012) was 400,000 bags yet the production was at 2.2 million bags, hence being a net exporter of maize, the country's staple [Interview with Ministry of Agriculture Officials]. Most of the maize was grown by small holder farmers in different locations, especially in Angata Barakoi location [not directly part of the study area] This situation [of food security] was likely to change given continued land sub divisions and the impact of establishing a sugar processing mill in Keiyan division at Enoosaen that would see many farmers shift to sugar cane growing or leasing their farms to those who would engage in sugar cane farming rather than growing traditional food crops such as maize. In fact, the County Integrated Development Plan [CIDP] notes that acreage under maize has been declining, partly due to competing crops, climate change and emergence of diseases [11]. According to the local agricultural officers, there was need to encourage commercialization of agriculture in the sub county as a measure of increasing farm incomes and wealth creation and tap into emerging industrial crops such as sugar cane growing. The local officials were also discouraging the selling of green maize to traders arguing that it would contribute to short term food insecurity within the sub county and at individual household levels.

The change in tenure from group ranches to individual ownership has created a vibrant market for land leasing that in turn has led to increased agricultural activities, hence improving productivity in those locations where land adjudication and registration was complete. While it was not possible to measure the exact

changes in levels of productivity, it was considered in terms of increase in cropped land and commercialization of agriculture such as sugar cane farming, raising dairy cattle under zero grazing and maize production for the local market. Policy makers have noted that increase in agricultural productivity is critical in helping poor households who are dependent on agriculture move out of poverty and that both state and non-state actors should actualize policies that would remove barriers to increasing such productivity [15]. These measures include uptake of inputs such as fertilizers by small holder farmers, streamline marketing channels, increased access to agricultural financing and stronger farmer organizations, amongst others.

Community owned land included community managed forests, the Mara conservancy, water springs or catchment areas while government owned land was confined mainly to government institutions such as schools, hospitals, Kenya Agricultural Research Institute and markets.

8. Conservation

In regard to conservation, wildlife-based tourism plays a major role in the economy of the county because it hosts the world famous Maasai Mara Game Reserve. The Maa has a unique conservation culture that respects nature and minimizes the human-wildlife conflicts [16]. In case of Transmara sub county, it was noted that parts of the sub county were designated as wildlife reserve and was being managed as Mara Conservancy, being part of the greater Maasai Mara Game Reserve ecosystem. The Conservancy was required to send at least 19% of its earned revenue to the affected group ranches that normally use it in building of schools, hospitals and providing bursaries to children from those areas.

A majority of the respondents considered the conservation challenge to be more farm based in terms of maintaining soil fertility or land productivity. They achieved this by practicing crop rotation, paddocking their farms so as to have zero grazing and access animal manure, agro-forestry and terracing in some cases.

On the wider community scale, wildlife conservation was generally accepted but there were increasing cases of human wildlife conflicts. As pointed out in Narok County Physical and Land Use Development Plan for 2023-2032 [13], these conflicts are a key challenge to the tourism sector. The conflicts is attributed to increased competition for pasture between wildlife and rapidly increasing livestock population and as a result of the contraction of wildlife range due to increased human population density. Other scholars have looked at the impact of these conflicts on economic well-being of the communities and in turn how they affect wildlife movement, especially the elephant [16]-[18]. The threat to forest cover in the wider county is attributed to human activities that include grazing, charcoal burning, extraction of wood fuel and expansion of cultivation into lands that were previously used for grazing by wildlife [13].

In Moyoi location, land owners whose lands bordered the conservancy and the game reserve were being encouraged to set aside part of their land as private

conservancies and partner with communities, though this was yet to pick traction at the time of the research and 40% of respondents complained that they were affected by human-wildlife conflicts.

The sub county also has Leila forest, Nyekwere and a community-based forest in Kiridon division. Leila forest is a breeding ground for elephants from Mara and there was a corridor that the elephants usually follow, unfortunately the land where the corridor was had been allocated to an individual when the group ranch was being sub-divided creating a barrier on the migration route for the elephants. Forest conservation in the sub county faces a number of challenges that include encroachment, clearing of land for agriculture, charcoal burning, illegal logging, financial challenges and political interference by people who have interest in controlling the forests. These conservation areas have not been affected by land sub division and to a large extent remain intact although there are cases of human-wildlife conflicts that arise, especially where former wildlife corridors have been blocked by farmers. To mitigate the effects of land subdivisions on forested areas, the local forest officers and administration were encouraging farmers who had been issued with titles to practice agroforestry and at least set part of their land for forestry activities.

9. Limitations

While changes in tenure and individual ownership of land have led to increased agricultural production in the sub-county, many of the respondents' cited drought, changes in climatic calendar and declining land sizes as factors that constrain overall production. The establishment of Transmara sugar company mill at Enosaen has also affected land use with a number of respondents leasing their land to sugar cane farmers, reducing the acreage that would traditionally be under food crops.

10. Conclusion

In spite of the sensitivity of the research topic given that land issues are usually emotive and contentious, the research was able to establish that tenure changes were taking place in the subcounty at the time and the process of adjudication and registration was in various stages in different locations at the time. In Transmara, partly because of historical factors, questions on land ownership and transactions were suspiciously considered by respondents who feel that such questions may be setting a stage for appropriating and allocating the land to people from outside the community.

The study also concludes these tenure changes have resulted in increased agricultural productivity based on land leasing, expansion in cropped areas, commercialization of agriculture such as sugar cane farming and increased use of fertilizers. However, there is a need to be cautious in the levels of land sub division's as continued fragmentation and limited farm sizes can reduce a farmers' ability to adapt to climate change and attendant challenges [14]. These findings resonate

with the county government's efforts to increase agricultural productivity in the sub county that has focused on commercialization, value addition, provision of inputs, improved animal genetics and access to markets [19]. The findings also tend to support literature that argues that land registration in Africa that confers individual ownership can positively contribute to agricultural production even though it is necessary to take measures that will minimize chances of some members in the community becoming landless. [20].

The greatest challenge to conservation was human-wildlife conflict, blocking of wildlife migration corridors by individual land owners [21], unregulated timber harvesting and charcoal burning within protected forests and those on individual farms. As pointed out by [22], land sizes and their management are also a critical factor in forest conservation in the sub county.

Conflicts of Interest

The author declares no conflicts of interest.

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