



## The impact of Land Fragmentation/Segmentation on Production and Food Security (Case study: Three major regions in Kenya)

Nandwa J.Musambayi

School of Business and Management Sciences, Chepkoilel University College – a constituent college of Moi University, Eldoret, Kenya.

### ARTICLE INFO

#### Article history:

Received: 16 January 2013;

Received in revised form:

11 March 2013;

Accepted: 14 March 2013;

#### Keywords

Land,  
Fragmentation,  
Food,  
Productivity,  
Security.

### ABSTRACT

Land is critical to the economic, social and cultural development of Kenya. It is crucial to the attainment of economic growth, poverty reduction and gender equity. Its importance is recognized by various Government initiatives including the initial Poverty Reduction Strategy Paper (PRSP), political party manifestoes and the Economic Recovery Strategy for Wealth and Employment Creation (2003-2007). Land was a key reason for the struggle for independence and Land issues remain politically sensitive and culturally complex. The Republic of Kenya has an area - approximately 582,646 sq.km comprising of 97.8% land and 2.2% water surface. Only 20% of the land area can be classified as medium to high potential agricultural land and the rest of the land is mainly arid or semiarid. Forests, woodlands and national reserves and game parks account for ten percent (10%) of the land area, i.e. 58,264 sq. km. Approximately seventy five per cent (75%) of the country's population lives within the medium to high potential (20% of land area) and the rest in the vast Arid and Semi-Arid Lands (ASALs). One consequence of this is that size and distribution of land varies quite widely just as population density which ranges from as low as 2 persons per sq. km. in the ASALs to a high of over 2000 in high potential areas. This leads uncontrolled subdivision of agricultural land, leading to reduced productivity and hence a likelihood of food insecurity. As the old saying goes, 'the devil is in the detail' - in our case FRAGMENTATION.

© 2013 Elixir All rights reserved.

### Introduction

#### Sustainable Production Principles

Key problems that need to be resolved at the level of policy and law include:

- Underutilisation of land particularly in large farms;
- Land deterioration due to population pressure, massive soil erosion and variability in climatic patterns among other things;
- Poor infrastructure leading to abandonment of agricultural activities;
- Emergence of land use conflicts as a result of competing land uses;
- Uncontrolled subdivision of agricultural land;
- Indiscriminate sale and purchase of land;
- Overstocking in rangelands; and
- Limited extension services and shortage of agricultural finance.

The Kenya Government has had to grapple with major challenges in matters dealing with land. It was faced with the problem of ensuring that all land is put into productive use on a sustainable basis by facilitating the implementation of key land policy principles on sectoral land use, productivity targets and guidelines as well as conservation of land quality. Notwithstanding the remarkable success of the land reform process in Kenya, land fragmentation emerging as a side effect with detrimental implications for private and public investments, sustainable economic growth and social development. Consequently less-favoured and least-developed regions with economies still depending on agriculture have been witnessing

negative growth rates, soaring unemployment, mounting rural poverty and as a result, serious social and economic disintegration and wide-spread disappointment among local actors and stakeholders.

Land-use regulations are generally established either through an Act of Parliament or local bylaws. In most of post independence Africa, land-use regulations were inherited from the colonial era (Shivji et al., 1998; Okoth-Ogendo, 1991) and enshrined in the country's constitution at independence. For example, in the Kenyan constitution, there were a series of safeguards that permitted settlers to convert all agricultural leases into freehold, made property sacrosanct and outlawed expropriation except on payment of prompt and full compensation. The issue in the Kenyan case, continuity of the system into the post independence period was granted through the inclusion of elites who had already started to identify with the system's basic principles, even before independence, in the Swynnerton Plan. "The act -African participation in estate farming in the highlands, for example, was a purely elitist exercise, is evident in the fact that the new settlers were almost exclusively local and national level politicians, civil servants, businessmen, the managerial cadres in private industry and later, the armed forces." (Okoth-Ogendo 1991:163). Demarcation:

#### Research Questions:

- How is land fragmentation/demarcation affecting land productivity?
- Are there ways of curbing land segmentation despite the increasing population?

3-Is food security in the country guaranteed given the continued subdivision of the meagre arable land?

4- Which other sectors of the economy are being adversely affected by the continued land segmentation?

5-Is government making any meaningful land reforms to curb this menace?

### **Land and Agricultural Development**

For the time being Africa remains predominantly rural. Poverty is concentrated amongst rural people and the rural poor continue to depend substantially on agriculture and related natural resources for their livelihoods. Across sub-Saharan Africa 78.6 percent of exports are primary natural resource products, providing 21.2 percent of GDP and much more in some West and Central African countries. In practice, smallholders make an immense contribution to agricultural output, generally holding land under customary tenure systems. African agriculture faces many challenges in a globalizing world with increasing competition and barriers to both local and global markets and the difficulties are particularly acute for smallholders.

Cheap foodstuffs produced by heavily subsidized farmers are dumped in Africa's domestic markets, displacing local produce, which is unable to compete.

In European and US markets, imports from Africa are facing rising barriers, through imposition of new standards and regulations by governments, and private sector actors. Smallholders, although central to the agricultural economies of most African nations and very responsive to new markets and opportunities, are unable to guarantee production at sufficient scale, quality and regularity to meet the needs of global markets dominated by supermarket chains. Despite the advantages of agribusiness in terms of market integration, smallholder farming makes efficient use of labour, generates the bulk of produce in many countries for domestic and regional markets especially for food crops, and, in the absence of widespread industrialization, provides a critical source of employment and the foundation of food security.

### **Family Ventures**

Families now need to be encouraged to run their land parcels as trusts or businesses. This can be enabled by formulation of better land policies towards that end.

The African governments could for instance, make huge subsidies to farmers as a way of motivating them to efficiently manage the use of land. This would be a real incentive.

In most of Africa, land-use regulations and planning frameworks have been an ideological tool for maintaining the unequal distribution of land and inequitable security of tenure. The regulation of land-use is usually rationalized on the basis of the need to protect the public interest. While there is a legitimate public interest in the way land and the natural resource base is used, the application of regulations to different tenure systems, and thereby to different land-use systems, is often unfair and inequitable. In analyzing the various forms and types of regulations governing land-use, it is important to go beyond the rationale and seek to uncover the origins and value systems implicit in such regulations. In many cases, the imposition of regulations is a way of protecting certain interests for which the claim of national or public interest is a smoke screen. In other cases, the regulations may, in theory, protect the public interest but, because of the nature of land distribution, the impact of such regulations might be to deny the legitimate rights of those affected.

### **Population Increases vs. Need for food**

Rapid population growth, widespread poverty, persistent food insecurity, and alarming rate of environmental degradation have fuelled an increasing debate on land tenure systems and land reforms in Africa. Some expert and donor circles have attributed the interrelated problems of rural poverty, poor agricultural performance and low levels of economic growth to the persistence of farming systems based on customary tenure. This view has inspired a variety of land reforms with a general trend toward market-oriented access to, and privatization of, land through private entitlement, on the premise that individualized tenure offers the best certainty in land rights, which provides incentive and facilitates access to credit for investment in agriculture and natural resources and, thereby, contributes to increasing agricultural productivity and improving natural-resource stewardship. The rural populace for whom agriculture is the primary source of direct and indirect employment would be most affected due to the vulnerability to global change processes (Ringler, 2008). Additionally the human alteration of land use patterns, elimination of wetlands and other biophysical changes could affect the water cycle ability to support the needed food production.

### **Rural-Urban migration**

Again, this is a scenario that governments ought to encourage. I am told that in the West, majority of citizens live in urban areas. This leaves on a few on the agricultural land to continue food production to feed the urban majority. My honest view is that this is way to go in Africa—a paradigm shift must take place immediately.

### **Land Policies**

In Malawi for example, perennial hunger had reached unprecedented levels. There had to be a change in government policy. It is worth noting that President Bingu Wa Mutharika had to appoint himself Minister for agriculture in order to push the necessary reforms in food production GOM (Government of Malawi) and World Bank (2006). The situation in that country now is different- they are exporting maize! and a word has it that their reserves hold an amount that can last them seven years even if it were not to rain in that period (Chinsinga B.2008).

### **Food Insecurity**

The communities in arid and semi-arid lands of the country are particularly vulnerable to food insecurity because of the recurring natural disasters of drought, livestock diseases, animal and crop pests, and limited access to appropriate technologies, information, credit, and financial services.

Food security revolves around complex issues that encompasses a wide range of interrelated environmental (and climatological), economic, social and political factors. In 2003, FAO defined food security as existing when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Devereaux and Maxwell (2001) defined food security as the success of local livelihoods to guarantee access to sufficient food at household levels. Agriculture has been identified by the food and agricultural organization (FAO) as having a vital role to play in food security. In Kenya weak land laws have been blamed for chaos since 1992. In recent public hearings on land laws complaints of corruption in land registries dominated the discussion.

Kenya's average poverty level exceeds the 50% mark. The number of the absolute poor increased from 10 million in 1994

to 13.4 million in 1997 and by the year 2000, the overall poverty situation in Kenya was 56% of a population estimated at 30 million people. The reasons for the worsening situation are many and varied. The causes of poverty and food insecurity in Kenya include low agricultural productivity, inadequate access to productive assets (land and capital), inadequate infrastructure, limited well functioning markets, high population pressure on land, inadequate access to appropriate technologies by farmers, effects of global trade and slow reform process.

Poor planning results in available resources being directed to interventions that does not give sustainable impact. For example when North Eastern parts of the country experienced extended drought for four consecutive seasons, the Kenyan Government, United Nations Agencies and NGO.s spent a total of 27.2 billion Kenya shillings or US \$340 million, on the provision of famine relief food to the affected 4.1 million people from March 2000 to September 2002. Approximately 20% of the amount was spent on food distribution and logistics. Properly planned, this amount of money would go a long way in establishing sustainable food security measures in the country.

#### Methodology:

This research was a survey research which is applicable from the view of aim. This study sought to describe impact food security as a result of continued land family land fragmentation in Kenya. Survey researches describe existing phenomena and pay attention to existing conditions or relationships, current processes or the resultant effects. The statistical population of this study are families who own land for agricultural purposes. Based on the target population size which is 120 families, the sample size is 90 in three different regions in Kenya. Also the purposive sampling method is used. In order to gather data, questionnaires and interviews were used.

In order To assess the reliability, a pilot study was carried out on 15 families aiming at confirming the clarity of the questions. The pilot project was very successful. Data was analysed by using SPSS computer program by aid of a simple regression model.

#### Findings and Conclusions

##### The correlation and regression:

We used the simple regression model to investigate the significance relationship between land fragmentation (as independent variable) and food productivity and security (as dependent variables) based on data obtained from the questionnaires and interview schedules.

$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon_i \dots\dots$$

$Y_1$  = Land Fragmentation

$X_1$  = Land Productivity

$X_2$  = Food Security

$X_3$  = Increasing Population

$X_4$  = Land Reforms

$X_5$  = Other Sectors like Ecology and so on

$\beta_0$  = Constant of the model

$\beta_i$  = Coefficients of the independent variables

$\varepsilon_i$  = Error term of the model

In this investigation at first we determined the correlation coefficient in which the relationship between the independent

and dependent variables are examined. Based on simple regression model the results were summarized in Table 4.2 given. The results show that there is a significant relationship between land fragmentation and food productivity & security.

1. There is a significant relationship between land segmentation and adverse effects on other sectors of the economy
2. There is a significant relationship between land segmentation and productivity
3. There is a significant relationship between land fragmentation and food security
4. There is a significant relationship between land segmentation and population increases
5. There is a significant relationship between land fragmentation and government land reforms

**Table 4.2: Factors that influence Food Productivity & Security in Land Matters in Kenya-2010**

Factor	Coefficient	S.E.	T-Test	Prob. (%)	Sig.
Land Productivity ( $X_1$ )	0.177	0.670	3.130	89.1	0.002*
Food Security ( $X_2$ )	0.462	0.502	1.181	35.6	0.007*
Other Sectors ( $X_5$ )	1.25	0.412	0.623	42.7	0.003*
Increasing Population ( $X_3$ )	2.097	0.329	0.538	45.6	0.051*
Land Reforms ( $X_4$ )	0.203	0.218	0.931	44.9	0.002*
Constant	3.634	2.318	1.568	02.6	0.117
-2 Log likelihood	105.198				
Chi-square	16.219				
Cox & Snell R Square	47.382%				
Nagelkerke R Square ( $R^2$ )	69.174%				

Field Data, 2010

The \* indicates that the variable of factor is significant.

#### Recommendation

It is recommended that action needs to be taken given that land fragmentation has an impact on all dependent variables. As the study has unearthed, all factors like food security, land productivity, population increases, reforms and others like environment – they depend on how land factor is handled. An immediate action is the only remedy.

#### References:

- Chinsinga, B. (2008) 'Exploring the politics of land reforms in Malawi: a case study of the Community Based Rural Land Development Programme'. (Unpublished paper), Zomba: Chancellor College.
- Deressa, T., Hassan, R. M., and Ringler, C. (2008). Measuring Ethiopian Farmers Vulnerability to Climate Change Across regional States, IFPRI Discussion paper 00806.
- Devereux S, Maxwell S. 2001. *Food Security in Sub-Saharan Africa*. London: ITDG
- GOM (Government of Malawi) and World Bank (2006) 'Malawi poverty and vulnerability assessment: investing in our future'. Lilongwe: Ministry of Economic Planning and Development.
- Okoth-Ogendo, H.W.O. (1991) *Tenants of the Crown: Evolution of agricultural law and institutions in Kenya*, Nairobi: African Centre for Technology Studies Press.
- Shivji, I., Moyo, S., Ncube, W., Gunby, D., (1998), Draft National Land Policy for the Government of Zimbabwe, Discussion Paper, Harare