Africa Journal of Technical and Vocational Education and Training

Alleviating Food Insecurity and Landlessness through Plantation Establishment and Livelihood Improvement Scheme (PELIS) in Kenya

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Abstract

Plantation Establishment and Livelihood Improvement Scheme (PELIS) is a modified form of non-residential cultivation that was practiced in earlier years in Kenya as a method of plantation establishment. PELIS was initiated with the objectives of fully rehabilitating and protecting the forest and improving the livelihood of the forest adjacent communities. PELIS is a Kenyan government scheme recognized under the Forest Act (2005) and managed by the Kenya Forest Service (KFS). The introduction of PELIS started in 2008 in some forest zones and is to be continued in other forest stations. The expected benefits from PELIS were numerous. First, there would be increased forest cover; increased volume of water from the catchment areas; increased food production, and there would be improvement in living standards of the communities living adjacent to forests due to increase in household incomes. More arable land would also be available on short term rotational basis. However, few studies have been conducted to show the status of PELIS in Kenya. Therefore, there is need to take stock of the contributions of PELIS on its expected benefits. This study investigated the contribution of PELIS towards alleviating food insecurity and landlessness. Purposive sampling was used to select the forest zones where PELIS is practiced and Community Forest Associations (CFAs) that participate in PELIS. Questionnaires were administered on the CFAs members to document arable lands given and food crops produced. IMB SPSS Statistics was used in the analytical process. Results showed that the arable land provided by PELIS to the Landless CFAs members over the years increased from 852.6 Ha in 2008 to 2,049.6 Ha in 2016. This represents an increase of about 0.04% of the national Arable land available in Kenya. The CFAs members grew 7 types of crops namely Potatoes, Maize, Cabbage, Peas, Beans, Carrots and Sukuma Wiki. Results also showed that PELIS in some forest stations produced up to 3 million bags of potatoes per year which contributed an annual total average of up to 3 million bags of potatoes from the forest zones investigated. This study has shown that PELIS is improving the livelihood of the forest adjacent communities by providing more arable land and food and consequently recommends that KFS should establish PELIS in the other remaining forest zones in order to provide more arable land especially to the Landless CFAs members and increase food production.

Keywords: **Food insecurity, landlessness, PELIS**

ISSN 2518-2722

Introduction

Plantation Establishment and Livelihood Improvement Scheme (PELIS) is a modified form of non-residential cultivation that was practiced in earlier years in Kenya as a method of plantation establishment (GOK, 2005; GOK, 2006; FAO, 2006). PELIS was initiated with the objectives of fully rehabilitating and protecting the forest and improving the livelihood of the forest adjacent communities (GOK, 2005).

PELIS is a Kenyan government scheme recognized under the Forest Act (2005), managed by the Kenya Forest Service (KFS). Its implementation targets communities with access to the forest for short-term cultivation and ensures achievement of the 10 per cent forest cover target as provided for in the Constitution. The regulations stipulate the creation of CFAs which draws membership from communities living adjacent to forests. Only members of CFAs can benefit from PELIS. The CFAs enter into an agreement with the KFS so that members proactively protect the forest against any destruction, including forest fires, illegal logging and burning logs for charcoal. Members become the watchdogs of the forest reinforcing the vigilance of forest guards. Under PELIS, KFS is bound by law to allocate CFA members acres of land where commercial trees have been harvested by industrial timber traders. The farmers are allowed to intercrop short-term crops such as Irish potatoes, beans, maize and green peas with tree saplings for a period of three to four years.

The introduction of PELIS started in 2008 in some forest zones and is to be continued in other forest stations. The expected benefits from PELIS were numerous Kenya Association of Forest Users, (KAFU). (2000). First, there would be increased forest cover; increased volume of water from the catchment areas; increased food production, and there would be improvement in living standards of the communities living adjacent to forests due to increase in household incomes (GOK, 1994). More arable land would also be available on short term rotational basis. However, few studies have been conducted to show the status of PELIS in Kenya. Therefore, there is need to take stock of the contributions of PELIS on its expected benefits. This study investigated the contribution of PELIS towards alleviating food insecurity and landlessness.

This paper presents the findings of a study conducted to document and analyze the contributions of PELIS in the forest zones and community where it is being practiced.

Methodology

Purposive sampling was used to identify Forest zones that practice PELIS in Kenya and these formed the study area. This area is Nyandarua, Nyeri, Meru, Baringo and Kiambu. CFAs that participate in PELIS in the study area were purposively sampled. Questionnaires were administered on the members of the CFAs to document the arable land that was given to CFAs from the year 2008 to 2016 and the resulting food produced from these lands. IMB SPSS Statistics was used in the analytical process. According to IBM (2016), this analytical tool addresses the entire analytical process from planning, data collection, analysis, reporting, and deployment.

Results and Discussion

Land given to CFAs

Results showed that during the period 2008 to 2016, Nyandarua County gave the highest hectarage of arable land to CFAs (8,524.4 Ha), followed by Nyeri (1,800 Ha), Meru (1,290 Ha) and Kiambu (1,140 Ha). Results also showed that the total annual arable land given to CFAs over the years increased from 852.6 Ha in 2008 to 2,049.6 Ha in 2016.

Availability of Agricultural land for crop production in many parts of Kenya has been challenging over the years because of increasing land use related problems over the years. According to Musa and Odera (2015), in the last four decades the emergence of new technologies and effects of rapid population growth around the globe have necessitated a tremendous shift by managers and planners on how to tackle land use and land cover (LULC) changes. Geospatial technologies have been used extensively in many areas of the world for generating valuable information on the forest cover, vegetation type, land use change detection and general environmental monitoring. Kiambu County is one of the most affected counties in Kenya by LULC changes due to its proximity to the capital city (Nairobi), good climate, fertile soils and improved infrastructure. PELIS is a potential scheme to reduce the effects of LULC.

New Arable Land made Available to Households/Landless People

The percentage of new arable land made available to the people who are landless is shown in Table 1.

Table 1: Percentage of New Arable Land made Available

	2008	2009	2010	2011	2012	2013	2014	2015	2016
PELIS Totals	852.6	1,078.4	1,593.4	1,428.6	2,049.6	1,078.4	1,593.4	1,428.6	2,049.6
National Arable Land (in '000)	5,300	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400
% New Arable Land	0.016	0.020	0.030	0.026	0.038	0.020	0.030	0.026	0.038

Results showed that the percentage of arable land allocated to CFAs increased from 0.016% in 2008 to 0.038% in 2016 (Table 2). Creation of extra arable land by PELIS is very commendable. Land is the most important resource in Kenya. However, of the total area of 582,646 km2, only 17% is suitable for rain-fed agriculture. About 2.2% of the arable land is covered by forest reserves. Arid and semi-arid lands (ASALs) comprising grassland and savannah rangelands cover the remaining 82%. The rangelands are home to 85% of total wildlife population, and 14 million people practicing dry-land farming and pastoralism (Mwichabe, Gitau & Lekupe, 2000; Wenner, 1983). Hence the contribution of PELIS in increasing arable land availability in Kenya is very significant.

Agricultural land particularly arable land is decreasing as human population increases. According to World Bank (2015) Arable land includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded. PELIS provides more arable land continuously on a short term rotational basis for crop production.

Food Contributions of PELIS

Results showed that the CFAs grew 7 types of crops namely Potatoes, Maize, Cabbage, Peas, Beans, Carrots and Sukuma Wiki (Table 3a and 3b). Results also showed that PELIS in some stations produced up to 3 million bags of potatoes per year which contributed an annual total average of up to 3 million bags of potatoes from the forest zones investigated. PELIS will contribute to making these CFAs members food secure. For instance, PELIS will help mitigate the fact that about 8.4 per cent of the population of Kiambu County often and/or always have no food at all in their households owing to lack of adequate resources for sustenance while 6.0 per cent of the population or members of their Households, often and/or always went to sleep at night hungry because there was not enough food (AWSC., 2014). Given that Kenya is one of the countries in sub-Saharan Africa that is not able to feed its population sufficiently and it, therefore, relies on outside assistance and that many food security projects have been funded by both the Kenyan government and other development partners in an effort to mitigate against food insecurity (Wabwoba & Wakhungu, 2013), PELIS is considered one such government project that is aimed at mitigating food insecurity.

The food contribution by PELIS is very significant. According to Owino (2012) and Zener (2014), official estimates indicate that over 10 million people in Kenya are food insecure with majority of them living on food relief. Households are also incurring huge food bills due to the high food prices. Maize being staple food due to the food preferences is in short supply and most households have limited choices of other food stuffs. PELIS is a promising strategy of helping to alleviate food insecurity.

The food crops grown and food produced from PELIS significantly adds to the food security measures taken by the Government of Kenya. The achievement of national food security is a key objective of the agricultural sector. Food security in this case is defined as "a situation in which all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life". In the recent years, and especially starting from 2008, the country has been facing severe food insecurity problems. These are depicted by a high proportion of the population having no access to food in the right amounts and quality. The current food insecurity problems are attributed to several factors, including the frequent droughts in most parts of the country, high costs of domestic food production due to high costs of inputs especially fertilizer, displacement of a large number of farmers in the high potential agricultural areas following the post-election violence

which occurred in early 2008, high global food prices and low purchasing power for large proportion of the population due to high level of poverty (KARI, 2015).

The yield of the various crops grown on the arable land given to CFAs is shown in Tables 3a and 3b.

Table 3a: Food contributions from Land allocated to CFAs under PELIS in bags (b) from 2008 to 2012

	2008	2009	2010	2011	2012
Nyandarua	Potatoes- 7,257.6 b Maize- 3,628.8 b Cabbage- 5,040 b Peas- 151.2 b	Potatoes- 9,072 b Maize- 3,628.8 b Cabbage- 6,047.8 b Peas1- 81.4 b	Potatoes- 21,686.4 b Maize- 9,036 b Cabbage- 1,389.3 b Peas- 502 b	Potatoes- 21,072 b Maize- 8,428.8 Cabbage- 14,633.3 b Peas- 526.8 b	Potatoes- 29,242.8 b Maize- 12,184.5 b Cabbage- 1,949.5 b
Nyeri	Potatoes- 5,000 b Maize- 1,200 b Beans- 800 b	Potatoes- 5,600 b Maize- 1,200 b Beans- 900 b	Potatoes- 6,000 b Maize- 1,400 b Beans- 1,000 b	Potatoes- 5,000 b Maize- 1,000 b Beans- 800 b	Potatoes- 5,000 b Maize- 1,200 b Beans- 800 b
Meru	Potatoes- 6,120 b Beans- 900 b	Potatoes- 5,850 b Beans- 720 b	Potatoes- 5,130 b Beans- 630 b	Potatoes- 5,850 b Beans- 900 b	Potatoes- 5,400 b Beans- 630 b
Baringo	Potatoes- 1,744 b Maize- 1,090 b Cabbage- 1,816.7 b Peas- 54.5 b Beans- 327 b	Potatoes- 1,526.4 b Maize- 848 b Cabbage- 997.3 b Peas- 37.7 b Beans- 2,544.4 b	Potatoes- 475.2 b Maize- 198 b Cabbage- 308 b Peas- 8.8 b Beans- 59.4 b	Potatoes- 500 b Maize- 200 b Cabbage- 555.6 b Peas- 12.5 b Beans- 25 b	Potatoes- 270 b Maize- 105 b Cabbage- 200 b Peas- 5 b Beans- 15 b
Kiambu	-	Potatoes- 244,444.4 b Cabbage- 555,555.6 b Carrots- 75,000 b Peas- 5,555.6 b Sukuma- 750,000b	Potatoes - 3,128,888.9 b Cabbage - 1,422,222.2 b Carrots - 160,000 b Peas - 28,444.4 b Sukuma - 1,920,000 b	-	-
Total	Potatoes- 20,121.6 b Maize- 5,918.8 b Cabbage- 6,856.7 b Peas- 205.7 b Beans- 2,027 b	Potatoes- 266,492.8 b Maize- 5,676.8 b Cabbage- 562,600.7 b Peas- 5,774.7 b Beans- 4,164.4 b Sukuma- 750,000b	Potatoes- 3,162,180.5 b Maize- 10,634 b Cabbage- 1,423,919.5 b Peas- 28,955.2 b Beans- 1,689.4 b Carrots- 160,000 b Sukuma- 1,920,000b	Potatoes- 32,422 b Maize- 9,628.8 b Cabbage- 15,188.9 b Peas- 539.3 b Beans- 1,725 b	Potatoes- 39,912.8 b Maize- 13,489.5 b Cabbage- 2,149.5 b Peas- 64,989 b Beans- 1,445 b

Table 3b: Food Contributions from Land allocated to CFAs under PELIS in Bags (b) from 2013 to 2016

	2013	2014	2015	2016
Nyandarua	Potatoes- 9,072 b Maize- 3,628.8 b Cabbage- 6,047.8 b Peas1- 81.4 b	Potatoes- 21,686.4 b Maize- 9,036 b Cabbage- 1,389.3 b Peas- 502 b	Potatoes- 21,072 b Maize- 8,428.8 Cabbage- 14,633.3 b Peas- 526.8 b	Potatoes- 29,242.8 b Maize- 12,184.5 b Cabbage- 1,949.5 b Peas- 64,984 b
Nyeri	Potatoes- 5,600 b Maize- 1,200 b Beans- 900 b	Potatoes- 6,000 b Maize- 1,400 b Beans- 1,000 b	Potatoes- 5,000 b Maize- 1,000 b Beans- 800 b	Potatoes- 5,000 b Maize- 1,200 b Beans- 800 b
Meru	Potatoes- 5,850 b Beans- 720 b	Potatoes- 5,130 b Beans- 630 b	Potatoes- 5,850 b Beans- 900 b	Potatoes- 5,400 b Beans- 630 b
Baringo	Potatoes- 1,526.4 b Maize- 848 b Cabbage- 997.3 b Peas- 37.7 b Beans- 2,544.4 b	Potatoes- 475.2 b Maize- 198 b Cabbage- 308 b Peas- 8.8 b Beans- 59.4 b	Potatoes- 500 b Maize- 200 b Cabbage- 555.6 b Peas- 12.5 b Beans- 25 b	Potatoes- 270 b Maize- 105 b Cabbage- 200 b Peas- 5 b Beans- 15 b
Kiambu	Potatoes- 244,444.4 b Cabbage- 555,555.6 b Carrots- 75,000 b Peas- 5,555.6 b Sukuma- 750,000b	Potatoes- 3,128,888.9 b Cabbage- 1,422,222.2 b Carrots-160,000 b Peas- 28,444.4 b Sukuma- 1,920,000b	-	-
Total	Potatoes- 266,492.8 b Maize- 5,676.8 b Cabbage- 562,600.7 b Peas- 5,774.7 b Beans- 4,164.4 b Sukuma- 750,000b	Potatoes- 3,162,180.5 b Maize- 10,634 b Cabbage- 1,423,919.5 b Peas- 28,955.2 b Beans- 1,689.4 b Carrots- 160,000 b Sukuma- 1,920,000b	Potatoes- 32,422 b Maize- 9,628.8 b Cabbage- 15,188.9 b Peas- 539.3 b Beans- 1,725 b	Potatoes- 39,912.8 b Maize- 13,489.5 b Cabbage- 2,149.5 b Peas- 64,989 b Beans- 1,445 b

The contribution of PELIS towards increasing food production in Kenya enhances the capacity and significance of the agricultural sector in the country. The agricultural sector is the mainstay of the Kenya's economy. The sector directly contributes 24% of the Gross Domestic Product (GDP) and 27% of GDP indirectly through linkages with manufacturing, distribution and other service related sectors. Approximately 45% of Government revenue is derived from agriculture and the sector contributes over 75% of industrial raw materials and more than 50% of the export earnings. The sector is the largest employer in the economy, accounting for 60 per cent of the total employment. Over 80% of the population, especially those living in rural areas, derive their livelihoods mainly from agricultural related activities. Due to these reasons the Government of Kenya (GoK) has continued to give agriculture a high

priority as an important tool for promoting national development (KARI, 2015).

Conclusions and Recommendations

In conclusion, the study has shown the following: The arable land provided by PELIS to the Landless CFAs members over the study period increased from 852.6 Ha in 2008 to 2,049.6 Ha in 2016. This represents an increase of about 0.04% of the national Arable land available in Kenya.

The CFAs members grew 7 types of crops namely Potatoes, Maize, Cabbage, Peas, Beans, Carrots and Sukuma Wiki. 3. PELIS in some forest stations produced up to 3 million bags of potatoes per year which contributed an annual total average of up to 3 million bags of potatoes from the forest zones investigated.

This study recommends that the Kenya Government and KFS should establish PELIS in the other remaining forest zones in order to provide more arable land especially to the Landless CFAs members and increase food production.

Acknowledgements

The author wishes to acknowledge the forest officers who helped in collection of data for this study.

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