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Tegemeo Institute Of Agricultural Policy and Development

Kenya Agricultural Monitoring and Policy Analysis Project

TAMPA
Measuring Income and The Potential For Poverty Reduction In Rural Kenya

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Introduction

Agricultural policy in Kenya often is made with little reference to statistics and hard data. Tegemeo Institute of Egerton University has been filling part of the information gap in the agricultural sector for the last decade, largely through sector specific pieces of work. Beginning in 1997 Tegemeo, in collaboration with a new partner, Michigan State University, began undertaking large household surveys. Michigan State has a long tradition of undertaking large household surveys to inform policy makers in different parts of Africa.

Household survey work by Tegemeo in Kenya began with two surveys, in 1993 and 1995 focusing on urban household consumption. These surveys focused on measuring the impact of maize market liberalization on urban consumption patterns. These surveys were followed with a large rural household survey in 1997. The present paper presents results from a 2000 update of the same survey.

The household surveys allow the calculation of household incomes in 9 representative zones of rural Kenya. The data also allow the decomposition of that household income into its key constituent parts such as income from crops, livestock, off-farm salary and informal business income. The spatial distribution of the study sites, and the fairly large sample within the zones also allow for the sampled households to be analyzed and differentiated based on zone and income, but also according to education and gender, for example, of the household head. It is a rich data set whose surface is only scratched in this single paper.

Large household surveys are expensive to mount, and very involving. But it is possible to generate the majority of key indicators using a Proxy Methodology that is introduced in this paper. Using that method, good econometrically derived estimates of indicators of interest can be generated without the full cost and logistical problems of collecting full information from thousands of households. Proxy methods are particularly useful as they can be updated annually. This is the kind of information that Kenya will need to generate regularly in order to fully monitor the outcomes of its poverty reduction strategy.

Monitoring poverty cannot only be done through household surveys. In this paper Tegemeo will also present in summary form, a methodology called the PAPPA - Policy Analysis for Participatory Poverty Alleviation - that combines the numerical and statistical techniques of the large or proxy survey, with participatory techniques. The combination of the two methods provides more insight into poverty, and how to deal with it, than either the either statistical or participatory approaches on their own.

This paper begins by presenting the findings of the 2000 survey in terms of household income and income sources. The proxy methodology is then presented followed by an introduction to PAPPA. The paper closes by linking the different methods used in Tegemeo to the monitoring and evaluation work that government along with the private sector and civil society will be undertaking as part of the Poverty Reduction Strategy - PRSP- process.

Methodology
Information and data presented in this paper is drawn from two sources.

1. Household Surveys
The survey was done in 2000 and covers 24 Districts in Kenya within which are 39 Divisions and 120 villages with a total sample of 1512 households.

The main objectives of the survey are:
a) Monitoring trends in growth and performance of the agricultural sector in Kenya.
This involves:
- Assessing the direction and magnitude of change in agricultural productivity.
- Identifying the major factors affecting changes in agricultural productivity.
- Assessing the impact of market reform on household welfare.

b) Identifying cost effective strategies likely to promote future agricultural intensification and productivity growth in Kenya's agricultural sector in the post-reform period.

c) Identifying key household income indicators that could be used to monitor changes in incomes levels as a result of policy changes and public investment. This could be used to inform debate on poverty reduction strategies

Sample Design and Selection

The sample was based on proportional sampling based on population. Census data was used to find the populations of all non-urban divisions in the country. The populations in all these divisions were assigned to one or more agro-ecological zones (AEZ) based on secondary data [1] and in house experience. This process resulted in dividing Kenya's rural population into its make up by AEZ. Within each AEZ, two or three divisions were chosen on the basis of their importance (population) within their AEZ. Diversity in cropping patterns was allowed to influence the selection of divisions where it was not clear which divisions to choose.

These divisions fell within 24 districts. The divisions were regrouped into the 9 agro-regional zones – a hybrid of broad agro-ecological zones, administrative and political boundaries -- presented in Table 1.

[1] This exercise depended heavily on the 1990 Census, District Development Plans and The Farm Management Handbook. CBS was not willing to share its sample frame.

Table 2. The Sample

Zone	District	% of Population 2000	HH in Sample 2000	
Northern Arid		4.37		**66**
	Garissa		32	
	Turkana		34	
Coastal Lowlands		5.22		**79**
	Kilifi		54	
	Kwale		25	
Eastern Lowlands		10.65		**161**
	Taita Taveta		11	
	Kitui		19	
	Machakos		22	
	Makueni		75	
	Mwingi		34	
Western Lowlands		11.71		**177**
	Kisumu		103	
	Siaya		74	
Western Transitional		10.98		**166**
	Bungoma(Kanduyi)		47	
	Kakamega (Kabras,Mumias)		119	
HP Maize Zone		26.39		**399**
	Bungoma (Kimilili,Tongaren)		37	
	Kakamega (Lugari)		28	
	Bomet		41	
	Nakuru		108	
	Narok		25	
	Trans-Nzoia		61	
	Uasin-Gishu		99	
Western Highlands		9.99		**151**
	Vihiga		60	
	Kisii		91	
Central Highlands		17.13		**259**
	Muranga		72	
	Nyeri		102	
	Meru		85	
Marginal Rain Shadow		3.57		**54**
	Laikipia		54	
Total				**1512**

A team of researchers visited the selected divisions in order to select locations, sub-locations and villages in which the survey was to be conducted. This was normally done through a blind equal chance ballot where a local official, usually the DO or DAEO helped chose the location, the Chief helped choose the sub-locations and Assistant chiefs chose the villages. The process of choosing households was a little more tedious but followed a similar pattern. Where a list of all the households was available (e.g. in famine relief areas) this list was used. Where other lists were available, e.g. coffee societies, those were used (but ultimately discarded due to bias – not all households grow coffee, and co-operative members tended to be older members of the community). Most commonly the team would collect together a group of community members and list all households in the village. Extra care was taken that e.g. households of unmarried mothers and widows were included.. The resulting list was divided by the number of households required. This gave us a step between households in the list. Balloting was used to determine at what position in the list the selection would begin, then e.g. every 5^{th} house would be chosen for interview. Appointment were made immediately but followed up through some local link person two weeks in advance of the visit.

Implementing the survey

The actual administration of a survey of 1512 households proved to be a major organisational and logistical operation. The questionnaire was administered by a team of 20 enumerators organised in 4 teams each led by a supervisor. The enumerators were hired from the recently graduated 1998/1999 class in Agricultural Economics and Agri-Business Management of Egerton University and other local Universities. The supervisors were Tegemeo research assistants. All undertook a period of training that involved understanding the questionnaire in English, Kiswahili and, where possible, the local language in the areas they would be operating in. The enumerators were grouped to reflect the different tribes in different regions of the country. Once the instrument was understood by all in the same way, and each question could be asked to elicit the required response from the respondents, the team went out on a series of pre-tests where all involved had several chances to try out the questionnaire on farmers. The iterative process of pre-test and office based trouble shooting was important to minimising enumerator based errors in data collection, through misunderstanding the question, asking it in the wrong way, or being misunderstood by the respondent. Each evening the teams and their supervisor would go over the filled questionnaires looking out for such problems.

The 4 teams of supervisor, 5 enumerators, driver and 4 wheel drive vehicle averaged about 13 interviews per day over a period of Seven weeks in Mid June to early August 2000. Each interview took anywhere from one and a half to two and half-hours. The combination of early starts, long travel distances, 21 page interviews, and checking in the evenings was quite demanding a needed a young and motivated team.

Data entry was done in SPSS and took 8 weeks. Data cleaning was a long and involving process that is still continuing. The data is organised in 18 files.

The survey instrument

The questionnaire was composed of 21 A4 pages covering a wide range of topics. Finalising it was a difficult process as different researchers had different ideas and last minute brain-waves about what should or should not be included, and how. The final document had the following components

- Identifying Variables
- Crop Inventory table for field, vegetables and tree crops, which were in the farm during 1999/2000 seasons.
- Crop enterprise table for the main and short season 1999/2000. Table gave details on acreage, land tenure, land preparations, seed type, fertilizer use, production, sales and price, buyer type.
- Expenses on hired labor for 1999/2000 cropping activities
- Expenses on salaried farm worker for cropping and livestock activities
- Fertilizer purchase, quantities, source and prices
- Credit sources and purpose
- Cropping alternatives (maize)
- Participation in grain markets
- Access to Infrastructure: distances to fertilizer seller, veterinary and extension services, telephone, roads piped water etc.
- Purchases for home consumption from June 1999 to May 2000.
- Livestock output and revenue (products and animals) for 1999/2000
- Demography: information of household members name, gender, age, education, number of months living at home, which year the member left, where they went to, and whether the persons engaged in business/ informal labor activities or salaried employment.

- Off-farm income earning tables which included:-
  1. Salaried employment in the formal and informal sector, this also captured remittance and pension.
  2. Business and informal labor activities.
- Ranking of economic activities: crop production and sales, livestock production and sales, farm kibarua, non-farm kibarua, salaried labor, business activities and remittance.
- Household Agricultural Assets: Type, quantity and value
- General observation question of the building material for the main house

Note: In this survey a 'household' comprise of members living in the same house, eat together and contribute to income. This excluded unmarried sons/daughters working and living away from home. However any contribution they made to the family was captured as remittance to the household.

The household composition also includes non-relatives e.g. house helps, shamba boy eating and sleeping in that house. Any income generated by the non- relative was not included in the household income.

2. Policy Analysis for Participatory Poverty Alleviation (PAPPA) Methodology

This approach is a combination of quantitative and qualitative analysis using the PRA tools to come up with a community action plan (CAP) and Economic analysis of the problems identified in the CAPs using site-specific household surveys and enterprise budgets.

The PAPPA study was carried out in Nyandarua, Kajiado, Mwea, Kilifi and Migori (Gunga).

Household Income Levels

Increasing levels and depths of poverty coupled with stagnating or declining income growth are the two major challenges facing Kenya today. With more than half of the rural population living below the poverty line (Ministry of Planning and Finance 2000a) and with meager incomes incapable of sustaining any meaningful livelihood, all efforts must thus be geared towards fighting this common enemy of development.

To achieve this goal effectively, it is important to understand the causes of the prevailing situation, its depth and the existence, if any, of signs of hope. Incomes, (both cash and in kind) earned by households are an important aspect in the livelihoods and well being of these households. In kind incomes are a source of food to rural households while cash income represents the household's purchasing power for the other basic necessities e.g shelter and clothing. Rural household incomes are complex owing to the multiple sources that it comprises of. However, the main sources of income for the rural people are crops, livestock and off farm.

Note that the incomes presented in this paper includes both cash and in kind. Total household income means the total value of all the productive and income earning activities of the household, both cash and in kind. The figures presented are all 'net' to the extent that was possible, but do not include the value of family labour particularly for crops and to some extent livestock, hence the figures are a return to both owners' management and labour. Inclusion of these costs, though important, would have made an already overwhelming exercise a gigantic task.
Per capita income was computed at the household level by dividing the total household income by the household size as per the household definition given in the methodology. Note that all the income figures are stated in Kenyan shillings (Ksh.).

Crop Income represents the 'net' value of all crops cultivated during the 1999/00 year. It is disaggregated into three components:

1. Cereals, Tubers and Pulses: this includes the value of all crops that fall under the three categories. This represents most of the crops mainly grown for home consumption with very little expected sales.
2. Fruits and Vegetables: this broadly encompasses horticultural crops for home consumption and for the market.
3. Industrial Crops: this includes all permanent crops and those that are purely grown for the market with very little or nothing for home consumption e.g tea, coffee, sugarcane, pyrethrum, among others.

Livestock Income includes the sum of the net sales of livestock plus the net value of livestock products. Net sales of livestock income is the difference between sales and purchases of livestock over the year while net value of livestock products is the difference between value of the different livestock products and the variable costs involved over the same year.

Off Farm Income is the sum of all non-farm incomes of the household. It includes:

- Informal and business income, which is the net incomes from all business and informal labour activities that the household engaged in. Share dividends earned over the year are also included here.
- Salaried Income, which is the gross value of all salaried (regular) employment of the household members as per the given definition. It also includes remittances and pensions.

Table 2 shows average levels of total and per capita incomes during the 1999/2000 year by zone. Generally, these incomes are low owing to the declining economic status of the country, which is affecting all sectors. The national average per capita income of ksh 22,112 (meaning about ksh. 1843 per capita per month) is barely adequate to maintain an individual in terms of food, shelter, clothing, education and health among others. This is however close to the provisional national GDP per Capita for 2000 of ksh 22,943 as given in the Economic Survey, 2001.

The high potential agricultural areas have relatively high incomes as compared to the less productive marginal areas. This shows high correlation/relationship between rural incomes and agriculture, due to the earlier national campaign to promote agriculture across the whole country. According to Table 2, Central Highlands leads followed by the High Potential Maize zone with the Western Lowlands coming last with only ksh. 47,750 for the whole year. Ironically, the highest income zone has incomes of up to four times the poorer one. The income structure seen below is mainly due to the different agro-ecological conditions and natural resource endowments across regions

Table 2: Mean Household and Per Capita Income by Zone

Zone	Total Income	Per Capita Income
Central Highlands	178,455	34,819
High Potential Maize Zone	171,609	24,297
Western Transitional	155,251	22,474
Eastern Lowlands	138,209	20,756
Western Highlands	113,675	18,423
Northern Arid	113,115	16,621
Coastal Lowlands	106,855	13,973
Marginal Rain Shadow	96,685	20,727
Western Lowlands	47,750	8,669
National	**138,704**	**22,112**

Source: Authors computation

Only Central Highlands, Western Transitional and the High Potential Maize zones are above the national mean income and per capita incomes. Far from expectations, the Eastern Lowlands precedes the Western Highlands, this being a result of the bumper harvests in the eastern region that followed the el-nino rains of 1997. On the other hand, all of the zones with the exception of the Central Highlands and the High Potential Maize

zone have their per capita incomes being less than the average national per capita income per month of ksh.1912. This is insufficient to meet the daily basic requirements let alone the need to meet the educational and health expenses of the individual. The Western Lowlands seem to lag well behind all the other zones with less than Ksh. 1000 per month per person. This is due to its relatively poor performance in all income earning activities as shown in Table 3.

Table 3 gives the total and per capita incomes by quintiles (defining the 20^{th} percentile) of the sample, showing the means by each of the quintiles. The highest quintile defines the top 20% of the sample and so on for the rest of the quintiles. From the table, it is clear that the highest quintile is on a class of its own, having a mean of more than double the mean household income of the next 20% of the sample. The lowest percentile also seems to be on its own defining a mean of about ksh. 20,000 for the whole year and a per capita income of about ksh. 400 per month. This is really a pathetic situation, for such incomes cannot even meet the daily food needs let alone the other basic needs. Out of the 302 households that are in the lowest quintile, about 31 % are from the Western Lowlands.

From the foregoing, it is worthwhile to say that even in the rural areas, the gap between the rich and the poor is so big hence the need for specific pro-poor policies at a nationwide level. Needless to say then that even within those said to be below the poverty line, there are those very needy households that may need urgent attention even as policies/ strategies to reduce poverty are implemented. These could be those under the category that the Welfare Monitoring Survey (WMS) unit refers to as the 'hardcore poor' who are distributed all over across regions.

Table 3: Mean Household Total and Per Capita Income by Income Quintile

Income Quintile	Total Income	PC Income
1 -Highest	354,010	51,592
2	159,859	26,811
3	99,068	16,981
4	58,766	10,330
5 -Lowest	21,149	4,831

Source: Authors computation

It is interesting to note that not even the Central Highlands, which has the highest incomes, seems to get closer to the mean income by the highest quintile. It is actually 50 percent of the highest income quintile and only fits into the second quintile. The mean income for the poorest zone (Western Lowlands) is also far above the mean for the lowest quintile, which means that these so called hard core poor are distributed across all the zones as opposed to being concentrated in the poorest regions. This is an indication that apart from the regional differences in income levels, there does exist major income disparities within zones. This means that the 'rich' and 'poor' live together and are just neighbours. Even within the same village, there are those that have access to inputs and services like credit, fertilizer, education, electricity etc, while others are not. Overall, this is an indication that with appropriate and relevant policies and intervention (pro-poor as

well as regional), there are still hopes that even the poorest of the rural folks could rise above the poverty line.

Composition Of Household Income

Table 4 shows the breakdown of total income by source. From the table, Western Transitional leads in crop income, this being mainly from the sugar belt followed closely by the Central Highlands with tea and coffee. The High Potential Maize zone follows with a major contribution from cereals. The Western Highlands have a higher crop income thus coming ahead of the Eastern Lowlands.

Table 4: Composition of Household Income by Source and Zone

Zone	Crop Income	Livestock Income	Off Farm Income
Central Highlands	94,048	25,579	58,829
High Potential Maize Zone	64,652	43,483	63,474
Western Transitional	97,775	12,896	44,580
Eastern Lowlands	51,773	18,506	67,930
Western Highlands	63,938	17,452	32,285
Northern Arid	41,860	57,168	14,087
Coastal Lowlands	33,302	3,838	69,716
Marginal Rain Shadow	13,202	24,525	58,958
Western Lowlands	15,602	8,000	24,148
National	**61,641**	**25,488**	**51,369**

Source: Authors computation

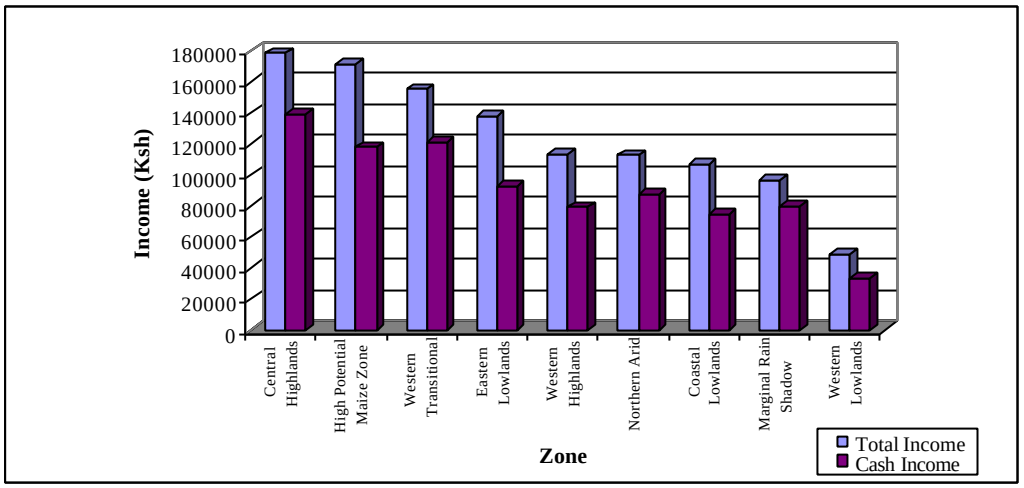
The table clearly shows the role that both agriculture and off farm activities play in the income earning capacity of rural households hence both should be seen as entry points in increasing incomes and reducing poverty. However, in the Northern Arid zone, livestock is the most important source of income. It is important to note that zones with highest total income seem to also have the highest income from crop production thus emphasizing the role crop production plays in the economy, particularly within the regions well suited and endowed for this activity. A close look at the percentage contribution of each of the three sources of income indicate a need to have regional specific interventions/policies so as to take advantage of the regional disparities that do clearly exist.

Cash Incomes

The incomes presented are both cash and in kind. However, cash incomes are an important aspect in the overall well being of households in terms of enabling the household to purchase basic necessities from the market as well as meet the daily expenses of clothing, education and health among others. The amount of cash incomes received by households depends on the amount and value of marketed production and the

level and nature of off farm activities of the household. Figure 1 shows the level of both total and cash incomes by zone.

Figure 1: Total Vs Cash Income by zone



In all the zones, the proportion of cash income to total income is between 67 and 82 percent. The high potential zones of the highlands benefit from sales of crops while the low potential zones get most of their cash incomes from off farm activities, which contribute greatly to their total incomes. The general trend is that those regions with higher crop incomes also double up as having higher proportions of cash income with the exception of the Northern Arid and the Marginal Rain Shadow zones. Northern Arid has the highest percentage of cash income due to the production under irrigation while the Marginal Rain Shadow experienced serious drought during the survey year hence most of their incomes are from off farm activities which is usually paid in cash. The high cash income across regions is an indication that the rural people do not rely on the market for non-food items only, but also for a good proportion of food items.

Crop Income

Kenya has predominantly been an agricultural based economy, where almost every household is involved in some agricultural activity particularly crop production. The contribution of crop income to total income is high and an effective target for raising incomes through appropriate policy direction in the sector. It is an important entry point for income growth and poverty reduction in the high potential areas of Central Highlands, Western Highlands and Transitional and the High Potential Maize zone, among others. Crop incomes in the 1999/00 season are generally low compared to other years due to the dry weather/lanina period that followed the 1997 El-nino rains.

Taking account the importance of different crop categories/types to different regions of the country can help guide poverty alleviation efforts targeted to specific regions as shown in Table 5 below.

Table 5: Composition of Crop Income by Type and Zone

Zone	Cereals/Tubers/ Pulses	Fruits/Vegetables	Industrial	Cultivated Acreage
High Potential Maize Zone	44,961	10,293	9,399	7.5
Central Highlands	23,531	8,085	62,431	3.5
Western Transitional	21,773	12,977	63,025	5.7
Eastern Lowlands	20,964	27,184	3,625	7.6
Coastal Lowlands	19,347	13,920	35	5.1
Western Highlands	14,607	18,562	30,768	3.4
Western Lowlands	9,038	3,685	2,879	3.6
Marginal Rain Shadow	2,346	10,630	226	2.9
Northern Arid	2,320	39,531	9	1.1

Source: Authors computation

As expected, the High Potential Maize zone had the highest value of cereals and tubers, this being the major maize-surplus region. Income from maize contributed about 64 percent of income from cereals, tubers and pulses and about 54 percent of total crop income in the High Potential Maize zone. The Eastern and Coastal Lowlands produce more cereals, tubers and pulses than the Western Highlands due to the smaller land sizes in the latter necessitating production of high value crops e.g. horticulture and industrial crops as shown in Table 5. The Marginal and the Northern Arid zones both earn meager incomes from cereals due to the harsh weather conditions. Introduction of drought tolerant crop varieties suitable to these drier areas could help in raising their incomes.

For fruits and vegetables, high incomes are earned from the less productive areas of the lowlands and the Northern Arid zone. This is a result of irrigation especially in the Northern Arid where horticultural production is practiced along the riverbanks. A case in point is the irrigated farming along the Tana River in Garissa district, resulting to the unusually high incomes (about ksh. 40,000) from fruits and vegetables in the Northern Arid as shown in Table 5. This shows the benefits of promoting and encouraging irrigated farming especially in the marginal areas as an alternative source of livelihood in drier areas. Fruits and vegetables are not a major cropping activity in the high potential areas hence the minimal incomes from this category of crops from these zones. Western lowlands perform poorly with the three crop categories. This western region and indeed the other lowland zones have potential for cotton which could be a cash earner and could also benefit from drought resistant varieties of maize and other cereals as a way of raising their crop incomes.

The role of industrial/cash crop production is vital as shown in the table. Central Highlands, Western Transitional and Highlands have relatively high incomes from the industrial crops, which explains their higher crop incomes resulting in relatively high-income levels shown in Table 2. It is clear that zones with high incomes are those with relatively high industrial crop incomes. Streamlining the performance of these major agricultural sub-sectors will significantly raise rural incomes in Kenya. As shown in Table 6, coffee, tea and sugarcane contribute over 45% of crop incomes from central and

western transitional respectively. The 2 zones, with the addition of the high potential maize zone, are leading in total income levels (see Table 2). The current restructuring of these major sub-sectors will go a long way towards improving the incomes of these households and the country at large since these crops are the major foreign exchange earner.

Consequently, zones with lower incomes namely the Marginal Rain Shadow, Coastal Lowlands and the Northern Arid have negligible incomes from industrial crops. Western Lowlands have some income from the industrial crops, which is basically from the sugar belt. Sugarcane would be an entry point for the people of Western Lowlands if the current constraints facing the industry could be addressed as well as the revival of the cotton industry.

Table 6: Contribution of Crop Income to Total Income

Zone	Contribution of Crop Income to total income	Contribution of Industrial crop to crop income	Contribution of the major crop to crop income
Western Transitional	63	64	46
Western Highlands	56	48	20
Central Highlands	53	66	47
High Potential Maize Zone	38	15	54
Eastern Lowlands	37	7	25
Northern Arid	37	0	-
Western Lowlands	35	25	17
Coastal Lowlands	31	0	30
Marginal Rain Shadow	14	2	-

Source: Authors computation

Coastal and Eastern Lowlands have no industrial crop but have maize contributing about 30 and 25 percent respectively of their crop incomes. These two regions with the addition of the Western Lowlands used to and could still benefit from cotton as a cash crop if the industry is revived. Any positive intervention targeted to increase the incomes of these lowland marginal areas must thus focus on their comparative advantage. Sunflower too is a potential cash earner in some of these marginal areas especially the Eastern Lowlands, but with the collapse of the domestic edible oil industry, the enterprise has ceased to be.
Western Highlands has about 20 percent from coffee and tea, the contribution being low due to small land sizes. The Northern Arid and the Marginal Rain Shadow could most benefit through higher productions of horticultural crops through irrigation and use of drought resistant varieties of maize and other cereals. The Northern Arid zone has a comparative advantage in beef production; hence policies geared towards improving particularly the livestock marketing in these areas would assist in improving the incomes hence livelihoods of this region.

Crop Incomes by Income Group of Households

The disparity in crop incomes does not only exist across different zones, but does also exist between the less poor and the poorest. Table 7 shows the level of crop income by tercile (33rd percentile).

Table 7: Crop and Crop Component by Income Group

Tercile	Crop Income	Cereals/Tubers/Pulses	Fruits and Vegetables	Industrial
Highest	124,998	46,106	25,209	53,683
Middle	43,992	18,420	10,137	15,434
Lowest	16,017	8,166	5,268	2,583

Source: Authors computation

Again, the mean crop income by the highest tercile is greater than the mean of the 'richest' zone, indicating that even the best performing zone is not yet attaining its potential and there is still room for improvement even in the Central Highlands and Western Transitional. As expected, industrial crops contributes the highest to crop income within the highest tercile, the percentage contribution declining down to the lowest tercile. The importance of cash crops or high value crops to total income cannot therefore be overemphasized. Contribution of industrial crops is at its minimum in the last tercile , this being representative of the marginal lowland areas with no cash crops.
On the other hand, the mean crop income by the lowest tercile is close to that of the Western Lowlands and the Marginal Rain Shadow, indicating that most of these households are in this lower income group. These areas do however have potential for cotton production, which has since collapsed. The revival of this industry would then help to raise the incomes of these regions.

Table 8: Income from Crops by Income Group and Zone

		Income from crops			
Zone	**Terciles**	**Highest**	**Middle**	**Lowest**	**Zonal Mean**
Western Transitional		157,906	65,194	21,786	97,775
Central Highlands		150,052	59,607	21,216	94,048
Northern Arid		141,035	11,318	9,787	41,860
Western Highlands		139,446	57,657	23,217	63,928
High Potential Maize Zone		113,147	39,230	15,414	64,611
Eastern Lowlands		90,866	41,333	20,382	51,653
Coastal Lowlands		81,396	21,597	18,430	33,302
Marginal Rain Shadow		33,040	10,447	6,066	13,102
Western Lowlands		24,263	28,784	10,839	15,602
National Mean		**124,978**	**43,964**	**15,980**	**61,641**

Source: Authors computation

From Table 8, the high potential areas have high incomes for those in the highest tercile but also very low averages for those in the lower group, meaning that the 'rich' and the 'poor' are all living together as shown by Table 9 below. In the high income earning zone

of Central Highlands, 46 percent are in the high-income tercile while 19 percent are in the lowest tercile with a mean crop income of ksh 15,980 per year. The Western Transitional and the High Potential Maize zone depict a similar trend. The Northern Arid and the Western Lowlands are highly represented in the lower tercile but poorly represented in the highest and middle tercile. A high of 72 percent of households in the Western Lowlands are in the lowest group.

Table 9: Percentage of Households by Income Groups

Zone	Highest	Lowest	Middle
Northern Arid	24	17	59
Coastal Lowlands	22	42	37
Eastern Lowlands	33	39	29
Western Lowlands	5	23	72
Western Transitional	47	28	25
High Potential Maize Zone	42	36	23
Western Highlands	24	38	38
Central Highlands	46	36	19
Marginal Rain Shadow	20	35	44

Source: Authors computation

The table above indicates that although there are serious disparities in the average incomes across regions, there are more serious differences between households in the same regions i.e. neighbours. This means there are very poor households in the high income earning zones and there are also relatively wealthier households in the low income earning regions. The sign of hope being the lessons that can be learnt between household within the same agro-climatic conditions, resource endowments and political and historical backgrounds. Table 10 shows some characteristics of households by tercile.

Table 10: Characteristics of Households by Income Groups.

Tercile	% female headed household	% used fertilizer	% Received credit	% used improved seed	Years of school	Acreage
Highest	8	83	46	87	7.7	8.1
Middle	13	70	32	80	6.0	4.2
Lowest	21	45	17	65	4.3	3.2
Total	14	66	32	77	6.0	5.2

Source: Authors computation

From Table 10, the highest income tercile has the highest percentage of households that used fertilizer, received credit and those that used improved seed. Those in the lower category had less of them with the above characteristics. There is thus a cyclical scenario whereby those who have higher incomes can buy fertilizer hence produce more and have access to credit due to their economic positions and the cycle repeats itself. On the other hand, those with less incomes cannot get credit hence cannot buy fertilizer and their yields are less hence less income and the cycle continues. The heads of households in the

higher income groups have more years of school than those in the lower groups meaning they are able to make informed decisions regarding farming. Better education could also imply opportunities for salaried jobs and other off farm incomes, which could supplement farming activities.

The percentage of female-headed household increases from the highest to the lowest tercile, an indication of the relationship between income levels and gender. In comparison to the male-headed households, female-headed households have less cultivated land, number of livestock and years of schooling that translate into low incomes.

Characteristics of Households by Zone

The level of incomes for rural households depends on several factors that do directly affect the major sources of income. For crop income, use of fertilizer, availability of credit, use of improved seed does highly affect the productivity hence income from crops as discussed previously. On the other hand, the household 's involvement in either informal or salaried activity does affect the off farm income from the household. Table 11 shows the percentage of those households that engaged in one activity or the other by zone.

Table 11: Characteristics of Households by Zone

Zone	% of Female Headed Household	% using fertilizer	% received credit	% involved in Informal Labour	% involved in salaried labour
Central highlands	11	99	74	56	58
High Potential Maize Zone	11	90	18	57	50
Western highlands	21	90	42	40	54
Western Transitional	16	79	52	60	52
Eastern Lowlands	15	45	14	81	80
Marginal rain shadow	15	30	20	61	59
Western Lowlands	24	12	13	57	51
Coastal Lowlands	6	6	3	92	70
Northern Arid	3	0	2	30	21
National	**14.3**	**66.1**	**32**	**59**	**55.5**

Source: Authors computation

It can be seen from the table, that the agricultural areas of the highlands and the High Potential Maize zone have the highest number of households using fertilizer thus explaining the high value of crop per acre in these regions. These areas, with the exception of the High Potential Maize zone are the cash crop areas where inputs like fertilizer are provided by the company on credit. The low potential areas have less of them using fertilizer, this being a result of lack of cash to purchase the input, but more so the returns to fertilizer use are low. There is need develop crop varieties that are suitable to these marginal areas and that can respond to fertilizer usage. For those varieties that already exist, the role of extension then comes in hardy.

Value of Crop Production

Table 12 below shows the value of crop production per acre across regions.

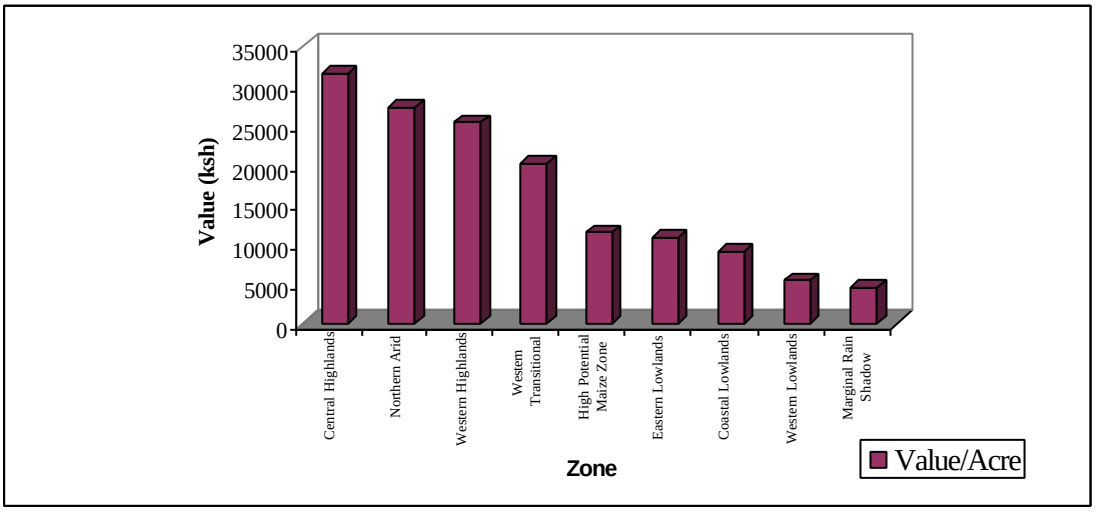
Table 12: Value of Crop Production per Acre

Zone	Value/Acre	Acreage
Central Highlands	31,546	3.5
Northern Arid	27,227	1.1
Western Highlands	25,342	3.4
Western Transitional	20,266	5.7
High Potential Maize Zone	11,489	7.5
Eastern Lowlands	10,769	7.6
Coastal Lowlands	9,123	5.1
Western Lowlands	5,439	3.6
Marginal Rain Shadow	4,569	2.9
National	**16,803**	**5.2**

Source: Authors computation

Acreage does not play any overwhelming role in income levels. Central and Western Highlands, with relatively high incomes, cultivate land well below the national average of 5.2 acres while some of the marginal areas with higher cultivated land have lower incomes. The major difference in crop incomes does occur in the value of crop that is harvested from a one-acre plot of the cultivated land in the different regions as shown by figure 2. This means that areas with high value crops particularly export-oriented cash crops will have high value per acre and high incomes.

Figure 2: Value of Crop Production per Acre

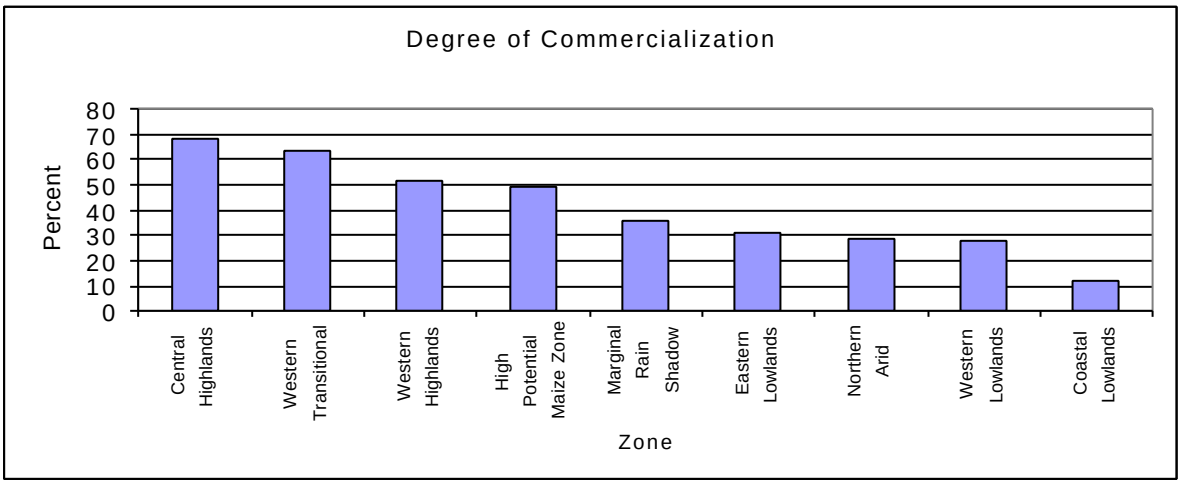


From the graph, Central Highland leads with the highest value per acre followed closely by the Northern Arid, Western Highlands and Transitional zones. With the exception of the Northern Arid where the high value per acre is due to irrigated farming of horticultural crops, the rest are the cash crop zones with tea, coffee and sugarcane. The high potential maize zone surprisingly has a low value of about ksh. 12,000 per acre, indicating that the high incomes are due to large cultivated land sizes averaging 7.5 acres for the region. This is an indication that there is still a lot of untapped potential even within the high potential areas, which can only be realized through agricultural intensification and productivity growth by increasing fertilizer usage, availability of credit and extension. The rest of the lowland zones have low crop values resulting from production of low value crops and low productivity. Increasing the incomes of these marginal areas would have to be through introduction of high value crops that have potential for these areas (e.g. cotton) or through irrigation.

Commercialization of Agriculture

Commercialization defines the proportion of agricultural production that is marketed.
Most of our rural households do not view agriculture as a business hence produce mainly for home consumption. However, for income growth and poverty reduction, the rural households, majority of whom live below the poverty line must start to see agriculture, which is their major occupation, from a commercial perspective. This means a transformation from the traditional subsistence farming to a more market oriented farming. This will mean a shift from some of the indigenous crops (and livestock) to higher value crops that are in demand by the market. This will mean a more flexible pattern of farming as opposed to the current one where a household continues to grow a certain crop year after year irrespective of the market needs. This will require aggressive extension campaigns and credit provision and a well-organized private sector to meet the needs of the farmers. Market information will again come in hardy. Figure3 below shows the extent of commercialization in crop by zone.

Figure 3: Commercialization of Agriculture

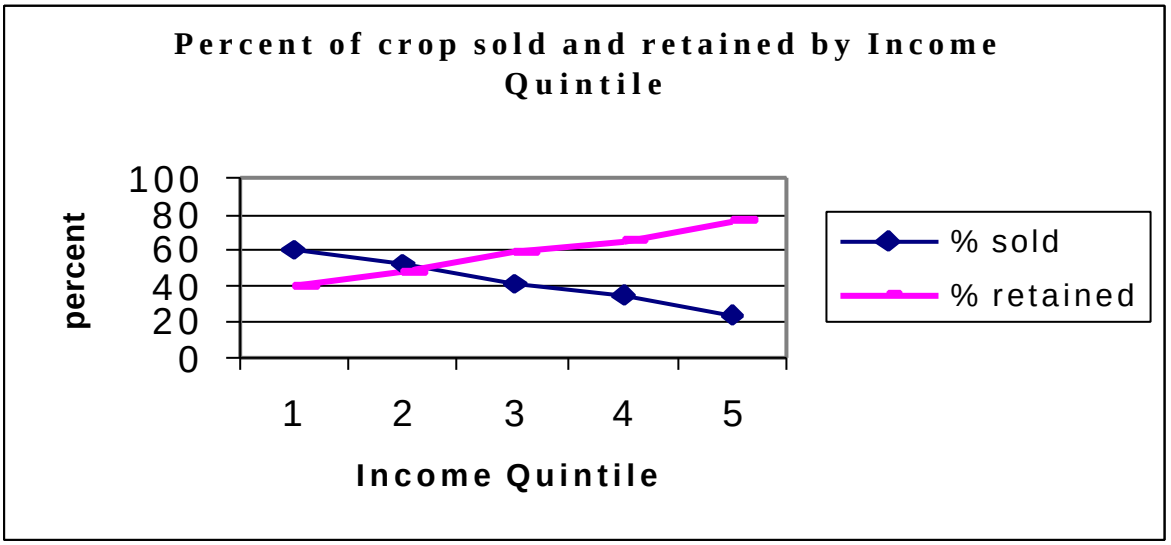


From the figure, the high potential zones of Central highlands, Western Highlands and Transitional have a higher degree of commercialization of over 50 percent. These are indeed the cash crop zones (e.g coffee tea and sugarcane), which are entirely grown for the market. These zones could however do better than this by putting more land under these cash crops and rely on the market for food requirements. The little maize they grow could be grown in the High Potential Maize zone and with every region utilizing their comparative advantage, they could all meet at the market place. This would have an overall improvement in the degree of commercialization and an increase in the incomes of these rural people. The High Potential Maize zone with a degree of commercialization of about 50 percent, would likewise benefit from producing more and improving on their productivity. This mutually beneficial scenario that encompass the theory of comparative advantage, would only work with a well developed marketing system which the households could rely on to provide an outlet for their marketed produce and to provide food at affordable prices when needed. In this era of free market, the main question is whether the private sector can be relied on to perform this role without jeopardizing the food security situation of the household and the entire nation.

The lowlands and the Northern Arid have a degree of commercialization of less than 30 percent with the Coastal Lowland being the least market-oriented. A revival of the cotton industry, as discussed earlier on, and an introduction of other drought resistant crops would help to improve this situation. The degree of commercialization is high for zones with high crop incomes and vice versa, hence as a way of raising incomes of the low income earners, there is need to engage in crops with high marketability.

The proportion of sold crop production not only differs across regions as discussed above but also between different income groups. Figure 4 shows the proportion of sold and retained value of crop production by income quintiles.

Figure 4: Proportion of Sold and Retained Value of Crop Production

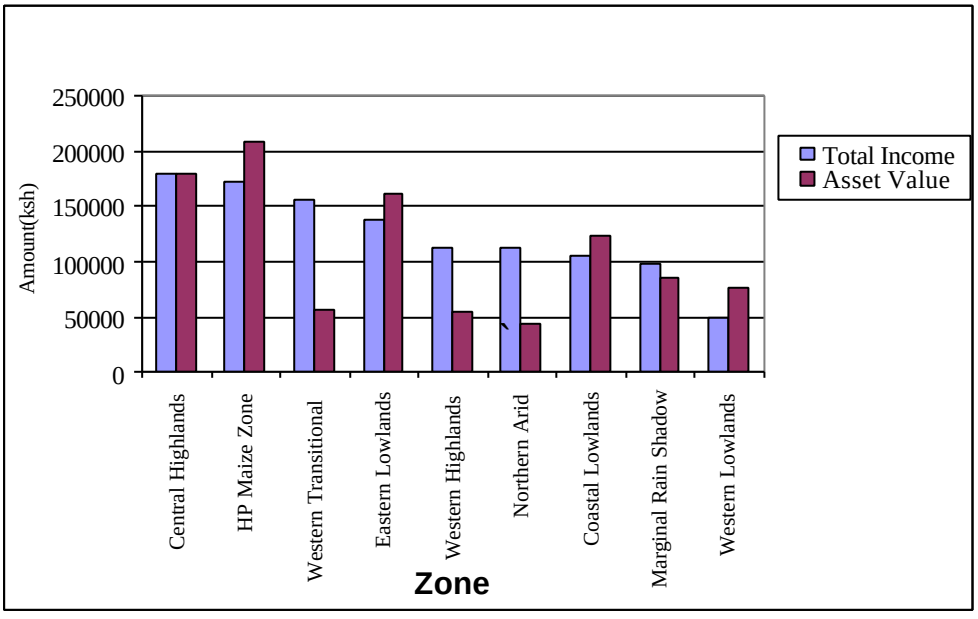


The figure shows that households in the highest income quintile have a higher percentage of sold crop than retained, they sell 60 percent and retain 40 percent for home consumption. The households in the second quintile sell almost as much as they retain, but as we move down to the lowest income quintile, the percentage of sold decreases steadily and the percentage of retained increases by the same magnitude. At the lowest quintile, only 20 percent of crop is sold and 80 percent is retained for home use. The trend clearly shown is that the degree of commercialization decreases steadily from the highest income earners to the lowest. This is due to the fact that the high-income earners have access to vital services e.g. credit, fertilizer, information which hardly get to the poorer households. An improvements and equity in the provision of these vital services and particularly targeted to these poor households would help to move these households upwards on the income ladder. Policies/strategies that could help these households to shift from subsistence–oriented agriculture to a more market-oriented one should be encouraged.

Household Incomes and Asset

The asset worth of a household is a good approximation of past household incomes and a good predictor of current income. The High Potential Maize zone has a high value of assets compared to total income, this being due to the level of mechanization of their production systems particularly for maize and wheat. The lowlands zones also have a high value of assets relative to total income owing to the current low-income levels but depicting the level of past incomes.

Figure 5: Household Incomes Vs Asset Worth by Zone



On the other hand, the Western Transitional has very low asset values. This is the sugar belt where most of the farming operations are done by the sugar companies on behalf of the farmers hence a higher asset income ratio. Western and Northern Arid zones have low asset values. Northern Arid households are mainly pastoralists with hardly any significant permanent assets.

From the above discussion, the current cropping patterns across zones can be made to yield higher incomes while some need a restructuring so as to take cognance of their comparative advantage. In the past, policies to promote income growth in the rural areas have been geared towards agriculture with a further bias on crop production. However, crop production is currently a profitable activity in the high potential areas of the country. This was initially a national strategy to help meet the self-sufficiency goal hence every household was encouraged to grow some crops irrespective of whether they were making any returns. With the change of this goal to a food security one, where access to basic food is emphasized, the rural households have not yet encompassed this due to:

- The unreliability of the marketing system to provide food when required and at affordable prices.
- Lack of other profitable employment opportunities.
- Lack of a similar change in policy towards these other opportunities.

This scenario has resulted in over reliance in agriculture (crops) even in areas where the activity is completely unviable. Table 13 shows percentage contribution of each of the major sources of income hence the role of each of them across regions.

Table 13: Percentage Contribution of Crop, Livestock and Off Farm to Total Income

Zone	Crop Income	Livestock Income	Off Farm Income
Western Transitional	63	8	29
Western Highlands	56	15	28
Central Highlands	53	14	33
High Potential Maize Zone	38	25	37
Eastern Lowlands	37	13	49
Northern Arid	37	51	12
Western Lowlands	32	16	49
Coastal Lowlands	31	4	65
Marginal Rain Shadow	14	25	61

Source: Authors computation

A close look at the percentage contribution of each of the three sources of income indicate a need to have regional specific interventions/policies so as to take advantage of the regional disparities that do clearly exist.

The Marginal Rain Shadow, Coastal, Eastern and Western Lowlands all have off farm income as contributing the largest share of household income. Since these areas represents the marginal areas of the country, then it is vital to have policies that present an enabling environment for off farm activities if these areas are going to rise above the poverty line. Emphasizing only on agriculture in these areas will only have a marginal effect. For the Central Highlands, Western Highlands and Transitional, agriculture contributes the highest percentage hence the emphasis is warranted. However, contribution by off farm activities does tally fairly well behind crop income even in the high potential areas hence must also be recognized and policies enacted to promote these activities. The High Potential Maize zone seems to benefit from policies geared towards all the three sources of income while the Northern Arid have livestock as the intervention point.

Income From Livestock Sales, and Sales of Livestock Products

Livestock production is a significant contributor to incomes in rural Kenya. Income from livestock and livestock products constitutes a low of 3 percent of income in the Coastal Lowlands and a high of 50 percent of income in the Northern Arid zone. The Northern zone has the highest incomes from livestock with average sales of livestock products, but six times the national average in sales of animals. In all zones apart from the Northern Arid zone, sales of livestock products - primarily milk, but also eggs- are far more important contributors to income than sales of the actual animal. Sales of livestock products are undertaken in small lots throughout the year rather than in a few large sales in the case of sales of cattle. Sales of small-stock, goats, sheep and chicken also are undertaken piecemeal as the need for cash arises. Income from sales of animal are net of purchases undertaken during the year so the figures shown do not account for all the cash a household may receive in a year from sales of animals.

Table 14: Livestock Income by Zone

Zone	Total Income	Livestock Income	Net Sales	Product Sales
Northern Arid	113,115	57,168	38,402	18,765
HP Maize Zone	171,609	43,483	9,171	34,312
Central Highlands	178,455	25,579	4,962	20,616
Marginal Rain Shadow	96,685	24,438	11,031	13,407
Eastern Lowlands	138,209	18,506	2,931	15,575
Western Highlands	113,675	17,452	2,110	15,342
Western Transitional	155,251	12,877	1,481	11,396
Western Lowlands	47,750	8,000	1,901	6,099
Coastal Lowlands	106,855	3,838	816	3,022
National	**138,704**	**25,488**	**6,291**	**19,197**

Source: Authors computation

The low incomes in the Western Lowlands comes in part from low incomes from livestock relative to other zones in the country. Western Lowlands is Ksh 5,000 – 70 percent- below the national average in net sales of animals, and Ksh 10,000 behind in sales of animal products. Coastal lowlands fares even worse in livestock income, but as will be shown later, makes up for this with very high off-farm incomes.

The regional story as regards income from livestock is not new to Kenyans. But Tegemeo was able to go one step further and see how income from livestock varies across income classes. There is a sharp difference in the amount of income earned from livestock across income groups within zones. In the key livestock areas of the north, for example, the wealthiest 1/3 of households receive more than 12 times as much from livestock as do the poorest households. In other regions the range is from 3-10 times. The livestock sector shows the same steep gradient in income across income classes as is seen in crop and off-farm income. The presence of high livestock income households among poorer ones

means that even within regions with low income from livestock, there are opportunities that some households have taken up.

Table 15: Livestock Income By Zone and Income Group

	Total Livestock Income		
	High	Middle	Low
Northern Arid	154,046	73,051	12,943
HP Maize Zone	75,521	26,747	10,982
Marginal Rain Shadow	44,366	31,476	9,731
Western Highlands	43,987	14,371	4,009
Central Highlands	38,706	18,470	6,659
Eastern Lowlands	35,535	14,765	3,926
Western Lowlands	24,503	16,415	4,273
Western Transition	19,257	8,284	6,058
Coastal Lowlands	10,927	2,690	987
National	**50,488**	**19,450**	**6,527**

Source: Authors computation

Table 16: Livestock Income By Zone, Income Group and Source

	Highest		**Middle**		**Lowest**	
	Net Livestock Sales	Livestock Products	Net Livestock Sales	Livestock Products	Net Livestock Sales	Livestock Products
Northern Arid	122,144	31,903	26,582	46,470	7,381	5,562
HP Maize Zone	14,266	61,255	7,162	19,585	2,965	8,017
Marginal Rain Shadow	15,038	29,328	14,277	17,199	6,624	3,107
Western Highlands	5,627	38,361	1,848	12,522	184	3,825
Central Highlands	7,818	30,888	3,197	15,272	1,267	5,392
Eastern Lowlands	5,608	29,928	2,084	12,681	989	2,937
Western Lowlands	11,569	12,934	2,900	13,515	977	3,296
Western Transition	3,024	16,233	139	8,145	86	5,972
Coastal Lowlands	3,379	7,548	-36	2,726	283	704
National	**12,508**	**37,981**	**4,446**	**15,005**	**1,920**	**4,607**

Source: Authors computation

The income inequality resulting from livestock activities in the northern zone comes from sales of animals rather than livestock products. The middle-income group in the zone actually sells an average of Ksh 15,000 more of livestock products than the wealthiest group of households. The same applies in the western lowlands. Another insight from the regional and income breakdown is the finding that in the western lowlands the wealthy and middle income households both sell similar amounts of livestock products, but the wealthy group also earn almost 4 times as much as the middle income group from sales of actual animals. The wealthy in Western lowlands should target selling an extra Ksh 25,000 worth of livestock products to reach the national average for their income group. In the western lowlands finding ways to increase herd sizes could be part of a poverty reduction strategy. Very low animal sales also reduces income in across all income groups the Western Transition zone. In the High Potential Maize Zone, the Ksh 40,000

extra of products sold by the wealthy group as compared to the middle-income group suggests increasing milk sales as a key strategy. Further analysis of the data would suggest if the route should be through more production per animal from fewer animals, or also from larger herd sizes. One scenario suggests extension and input finance as key inputs, the other land sizes and long-term finance to purchase more animals.

Productivity per milk cow is directly correlated with income with wealthier households having more milk produced per cow per year than other households. National yields per cow of 985 liters is 1,224 in the highest income group, 964 liters in the middle and only 424 liters per cow per year among the poorest 1/3 of population. Productivity per cow also displays distinct regional differences. Unimproved breeds of cows with no special animal husbandry produce 200-400 liters per year. Improved animals with some supplementation cross the 1,000 liter barrier. Milk productivity per cow in Kenya is well below levels achieved in other countries, or in the best local herds. Improving productivity per animal is a good candidate for inclusion in a poverty reduction strategy.

Table 17: Productivity Per Cow in Litres Per Year

	Mean	**Highest**	**Middle**	**Lowest**
Central Highlands	**1,589**	1,819	1,329	1,059
Marginal Rain Shadow	**1,109**	840	1,403	710
Eastern Lowlands	**870**	1,116	738	264
HP Maize Zone	**853**	1,051	846	446
Western Transition	**725**	746	1,029	446
Northern Arid	**354**	374	432	291
Coastal Lowlands	**294**	345	165	240
Western Lowlands	**253**	405	330	209
National	**985**	**1,224**	**964**	**424**

Source: Authors computation

Off -Farm Income

Off-farm income was first presented in Table 4 together with income from crop and livestock activities. In this section off farm income is examined in more detail in order to find the policy implications of our findings and ways in which the data collected can lead to more targeted interventions to increase it.

Disaggregating off-farm income gives new and interesting insights different from those in the rest of the paper. The most immediately obvious difference is that regions that have been ranking last in income rankings appear at the top of the league in the off-farm income stakes. Off-farm income is highest in the study sites in the coastal lowlands, followed by the eastern lowlands. Table 18 makes it clear that the dominance of coastal lowlands comes from informal activities while for the eastern lowlands salary income is more important than informal business activities. At the other end of the spectrum it is clear that there are limited salaried opportunities in the Northern Arid zone. Western Lowlands has the lowest income of all zones from informal and business activities and is only trailed by the Northern Zone in salary.
To attain the national average, Western Lowlands needs an extra Ksh 10,000 worth of salary, and Ksh 20,000 of off-farm income.

Table 18: Components of Off-Farm Income

Zone	Total Off-farm Income	Informal	Salary
Coastal Lowlands	69,716	40,575	29,141
Eastern Lowlands	67,930	31,503	36,427
High Potential Maize Zone	63,474	33,909	29,565
Marginal Rain Shadow	58,958	21,847	37,111
Central Highlands	58,829	26,129	32,700
Western Transitional	44,580	22,359	22,221
Western Highlands	32,285	9,244	23,041
Western Lowlands	24,148	8,921	15,226
Northern Arid	14,087	10,952	3,135
National	**51,369**	**24,579**	**26,790**

Source: Authors computation

Table 19 decomposes income from informal activities into income terciles. The High tercile covers households within the top one third of households in total income. Off-farm income contributes to that significantly. Incomes from off-farm sources show a clear difference between means in the different income classes.

Western Lowlands has the highest average income among households in the top tercile. Their incomes are double those in the other western zones, and almost 4 times those of the wealthiest households in the Northern Arid zone. High salaries among the high income group in the Western Lowlands account for this. Marginal Rain Shadow is another area boosted by salaries double the national average amongst the high-income group.

Table 19: Off-Farm Income By Zone, Source, and Income Group

a)	Total Off Farm Income		
Zone	**High**	**Mid**	**Low**
Western Lowlands	158,775	44,251	9,294
Marginal Rain Shadow	142,650	59,653	20,048
Coastal Lowlands	141,573	76,900	19,417
Eastern Lowlands	137,557	45,361	18,125
HP Maize Zone	118,912	31,764	11,605
Central Highlands	101,894	28,388	10,409
Western Highlands	77,819	29,451	6,808
Western Transition	70,820	30,449	11,326
Northern Arid	38,785	17,582	2,969
National	**105,848**	**37,152**	**11,107**

Source: Authors computation

b)	Salary Income		
Zone	**High**	**Mid**	**Low**
Western Lowlands	116,638	27,691	4,896
Marginal Rain Shadow	107,673	33,332	7,762
Coastal Lowlands	59,462	31,052	9,191
Eastern Lowlands	70,722	28,953	6,987
HP Maize Zone	56,689	14,397	3,636
Central Highlands	55,558	17,339	5,473
Western Highlands	52,991	24,270	3,243
Western Transition	37,760	12,713	3,776
Northern Arid	8,010	4,255	819
National	**55,316**	**20,352**	**4,701**

Source: Authors computation

c)	Informal Income		
Zone	**High**	**Middle**	**Low**
Western Lowlands	42,138	16,560	4,399
Marginal Rain Shadow	34,977	26,321	12,287
Coastal Lowlands	82,112	45,847	10,226
Eastern Lowlands	66,835	16,408	11,139
HP Maize Zone	62,223	17,367	7,970
Central Highlands	46,336	11,049	4,936
Western Highlands	24,828	5,180	3,565
Western Transition	33,060	17,736	7,550
Northern Arid	30,775	13,327	2,149
National	**50,531**	**16,800**	**6,406**

Source: Authors computation

The difference between the regions when the wealthier households are compared is small relative to the differences between wealthier and poorer households within a zone. Poverty has a regional dimension, but the differences are most severe between households in the same neighborhood. This is true for off-farm income. Perhaps by looking at the differences between households in the off-farm activities they undertake, strategies to improve the lot of the poor can be identified.

If the things wealthier households are doing can be adopted among poorer households, income from off-farm activities can be increased for the region, and for the country as a whole. Not everything wealthy people do can be started tomorrow by the poor. The high income among the wealthiest households in Western Lowlands, for example comes from formal sector salary and remittances that are double those of the high income groups in other zones. To access those opportunities households must have invested in education, either of the household head, or of relatives who work outside the region and send money back home.

Coastal Lowlands has the wealthiest group among all the regions earning high incomes from informal sector off-farm activities. High incomes come from fishing in one of the villages (14 percent of high tercile, 9 percent of middle group). In other sample sites the coconut tree provided opportunities to earn incomes through weaving products from the leaves(4 percent of high, 7 percent of middle, and 22 percent of poor), or brewing and selling coconut wine (11 percent of middle, 9 percent of poor). A third region benefited from opportunities from selling meals to workers in a nearby industrial plant (14 percent of rich group6 percent of middle, 8 percent of poor).

Analysis of income sources can help show signs of hope within regions, and target poverty alleviation efforts to assist those who actually are poor, rather than interventions that help every household in an area, or even worse, help only the rich, or the rich more than the poor. The data makes clear that regionally disaggregated information can be used to enrich the policy intervention design process.

The Use Of Panel Data To Measure and Explain Changes in Income Over Time

The household survey undertaken in 2000 went back to a panel of the same households as were visited, and asked the same questions in 1997. This gives a panel data set which can be used to measure changes over time. It is also useful as a cross check on one time events, like El Nino, or crop failure that affect results in one year. The overall picture is one of incomes reducing, particularly off-farm business (Western and Coastal Lowlands) and salary (Coastal and Eastern Lowlands as well as Central Highlands). Crop incomes rose, more or less in line with inflation, except where there were crop failures in Western Lowlands and Marginal Rain Shadow.

Table 20: Household Income in 2000 and 1997 By Zone and Source

2,000	**Total**	**Crop**	**Livestock**	**Salary**	**Business**
Central Highlands	178,455	94,048	25,579	32,700	26,129
Western Transitional	155,232	97,775	12,877	22,221	22,359
HP Maize Zone	171,568	64,611	43,483	29,565	33,909
Western Highlands	113,665	63,928	17,452	23,041	9,244
Eastern Lowlands	138,088	51,653	18,506	36,427	31,503
Coastal Lowands	106,855	33,302	3,838	29,141	40,575
Marginal Rain Shadow	96,497	13,102	24,438	37,111	21,847
Northern Arid	113,115	41,860	57,168	3,135	10,952
Western Lowlands	47,750	15,602	8,000	15,226	8,921
Real 1997	**Total**	**Crop**	**Livestock**	**Salary**	**Business**
Central Highlands	222,144	90,294	37,598	57,905	36,347
Western Transitional	132,440	62,827	17,598	20,822	31,194
HP Maize Zone	205,442	71,330	53,450	40,033	40,629
Western Highlands	91,313	34,544	14,777	20,499	21,492
Eastern Lowlands	183,373	59,921	18,385	78,747	26,319
Coastal Lowands	235,893	39,849	11,136	77,162	107,746
Marginal Rain Shadow	123,463	32,601	35,642	44,304	10,916
Northern Arid	126,659	40,256	66,302	10,653	9,449
Western Lowlands	87,860	22,591	7,428	24,654	33,187
Difference	**Total**	**Crop**	**Livestock**	**Salary**	**Business**
Central Highlands	-43,689	3,754	-12,019	-25,205	-10,218
Western Transitional	22,792	34,948	-4,721	1,399	-8,834
HP Maize Zone	-33,875	-6,720	-9,967	-10,468	-6,720
Western Highlands	22,351	29,383	2,675	2,542	-12,248
Eastern Lowlands	-45,284	-8,269	120	-42,320	5,184
Coastal Lowands	-129,038	-6,547	-7,299	-48,021	-67,171
Marginal Rain Shadow	-26,965	-19,499	-11,204	-7,193	10,931
Northern Arid	-13,545	1,604	-9,134	-7,518	1,503
Western Lowlands	-40,111	-6,989	571	-9,427	-24,266

Source: Authors computation

It was possible to say something about the HIV/AIDS scourge afflicting the country as it was possible to see who in the 1997 household was no longer there. Respondents were

asked whether they had moved or were dead. For those households where a member had died, we asked whether they had died from an accident, old age or disease.

The results were quite clear. Western Lowlands and Coastal Lowlands had the highest proportion of households where someone had died from a disease between 1997 and 2000. 12 percent of households in the sample had a member die from disease over the period.

Dying from disease does not necessarily mean that those individuals died of AIDS. However this analysis suggests that perhaps the Tegemeo sample provides a database from which, at some time in the future, the impact of HIV/AIDS on agriculture, cultivated area and household expenditure, for example can be computed.

Table 21: Mortality From Disease Between 1997 and 2000

	Total HH	Total Persons	Total # dead	# dead/w disease	# HH with Dead from Disease	% HH/w dead from disease
Western Lowlands	177	1,072	57	55	48	27
Coastal Lowlands	79	714	20	19	16	20
Western Transitional	166	1,328	29	25	23	14
Western Highlands	151	1,046	17	16	15	10
Eastern Lowlands	161	1,138	13	13	13	8
HPotential Maize Zone	399	3,110	38	33	33	8
Central Highlands	259	1,494	23	19	18	7
Northern Arid	66	536	5	4	4	6
Marginal Rain Shadow	54	311	3	0	3	6
National	**1,512**	**10,749**	**205**	**184**	**173**	**12**

Source: Authors computation

Combining Quantitative and Qualitative Participatory Approaches To Analyze Poverty

Tegemeo Institute recently undertook an exercise where the quantitative methods highlighted in the first parts of their paper were combined with participatory analytical approaches to see if the combination might provide more insights into the lives and policy issues facing Kenya than Tegemeo's traditional budget and household survey based approaches. The exercise was called Policy Analysis for Participatory Poverty Alleviation and went by the acronym PAPPA. In the following section that approach, and the analytical insights gained from it are presented. What becomes clear is that combing the two approaches provides far better insight into increasing incomes in rural Kenya than either method would on its own. The method was used in 5 sites around the country, but examples will be developed from a single site in the western lowlands, Gunga sub-location of Migori District. Western Lowlands was the poorest zone in the KAMPAP database.

Table 22: PAPPA Sites

PAPPA Site	Main Economic Activities	% less than $1 per day
Tebere Location, Mwea Div, Kirinyaga	Irrigated rice and vegetables	75
Gunga Sub-loc. Migori	Fishing, livestock, grains	90
Geta Location, Nyandarua	Dairy, peas and potatoes	77
M'bwaka-Kikomani, Kaloleni, Kilifi	Coconut products, off-farm salaries	79
Olgulului, Kajiado	Livestock	76

Source: Authors computation

Traditional Tegemeo budgeting produced the type of information depicted in Table 23 This information was combined with information from a household questionnaire administered on 15 percent of households in the area. This allowed computation of farm incomes from typical farm sizes. The Crop Income figure presented on the following page is analogous to the crop income figures presented in earlier sections of this paper. It is only the computational procedures that differ. The kind of detail collected by PAPPA would have been difficult, but not impossible, to collect using a large household survey. Nyambane (1998) reports of such an exercise undertaken recently by Tegemeo.

Table 24 goes one step further. Crop income is added together with livestock, off-farm, salary and other income (largely rent, remittances and dividends). This is analogous to what was done under KAMPAP as described in the earlier parts of this paper. Some of the other characteristics of households in the different clusters also are noted. In the extended paper such details as water source, types of floor, condition of house, etc are also differentiated by the different attributes on these items among the different types of households. Expenditure on food, education, healthcare and other budget items are laid out in Table 25.

Table 23: Gunga Farm Budgets

Revenues and Costs by Typical Plot Size

Crop	Sorghum	Maize	Maize/ Sorghum	Maize/ Beans	Millet	Sweet Potatoes
Median Acres per HH	1	1	2	2	0.5	0.25
Median Revenues	4000	6400	9600	11200	4000	2250
Input Costs	1510	1670	3310	4040	710	363
Labour Costs	1170	1920	2820	4440	1395	870
Net Income	1320	2810	3470	2720	1895	1018
Crop Income (Profit + Labor Costs)	2490	4730	6290	7160	3290	1888

Source: Authors computation

Table 24: Income And Characteristics Of Representative Households

Household Group	1	2	3	4
Percent of Households	51%	21%	18%	3%
Principle Source of Income	Crops and Livestock	Low Salary + Off-Farm	Salary and Off-Farm	Diversified (High Salary and Other)
Household Size	6	7	8	8
Crop Income	18,047	12,157	20,241	41,637
Livestock Income	17,600	14,400	23,000	162,075
Off-farm Income	8,800	33,770	40,000	10,120
Salary Income	0	40,000	90,000	130,000
Other Income	0	0	0	56,800
Total Income	**44,447**	**100,327**	**173,241**	**400,632**
Acres Owned	6	5	5	18
Acres Used	3.5	3.25	4	12.5
Non-Cash Income				
Own Labour	5,730	5,280	6,610	13,935
Owned Ox-plough	4,550		5,200	9,750
Livestock Inventory				
Cows	2	2	2	10
Bulls	1	1	1	6
Calves	2	2	2	5
Sheep and Goats	2	3	3	22
Chickens	7	7	8	100

Source: Authors computation

Table 25: Average Annual Household Expenditures by Group

Household Group	1	2	3	4
Food				
Maize	16,599	14,000	12,500	23,087
Sugar	4,924	4,000	5,000	7,500
Other food expenses	32557	26300	22450	17858
Meat	6,200	8,000	6,000	12,133
Milk	3,200	3,800	3,700	16,425
Total Food	**63,480**	**56,100**	**49,650**	**77,003**
Education				
Primary	1,200	1,200	1,000	950
Secondary	13,300	9,500	15,500	3,000
University	1,500	0	1,500	6,000
Total Education	16,000	10,700	18,000	9,950
Health	5,000	6,000	7,000	41,500
Social functions	3,000	1,000	2,400	9,000
Clothing	2,000	1,600	1,800	7,500
Household fuel	2,400	2,400	2,700	2,040
Entertainment	4,000	1,200	1,643	0
Other expenses	1,500	1,900	1,500	1,680
Travelling	2,000	2,500	1,200	10,000
Total Expenses	99,380	83,400	85,893	158,673
Total Income	44,447	100,327	173,241	400,632
Net Income	-54,933	16,927	87,348	241,959

Source: Authors computation

Household expenditures are detailed in Table 25. The wealthier group of households spends more on food than the other groups with larger purchases of maize, sugar, meat, and milk. In most other expenditure categories—clothing, social functions, travel,— the wealthiest group spends more than the other groups However, educational expenditures are roughly the same across all four household groups. Health, clothing, social functions and travelling are the expenditure categories where higher incomes apparently matter the most as the wealthy spend several times as much as the poorer households.

The study also noted other indicators of wealth or poverty at the household level and was able to relate income to other factors in the household, such as nutritional status of children, clothing, the condition of the residential house and sanitation. The wealthy group has most of those parameters rated good by the enumerators. Only the wealthiest households used improved seed or extension advice. Many farmers are not using extension advice at all. The study was also able to say which households members undertake trips to fetch water and their frequency. The most common trip in Gunga is the daily trip, by women, to the lake to fetch water - an average of 40 liters and a 4 Km trip.

Ranking Of Community Problems and Community Action Plan.

Following several types of community discussions using Participatory Rural Appraisal techniques in community meetings facilitated by the PAPPA team, the community in Gunga sub-location of Migori District generated the following problems, ranked in order of importance:

Ranked Problems In Gunga
1. Low food production
2. Low income
3. Lack of clean drinking water
4. Human diseases
5. Institutional failure/weak community institutions
6. Low status of education
7. Poor road network

Problems were analyzed to look at their root causes, and the coping strategies currently used. Potential opportunities to solve those problems were enumerated and ranked according to a number of criteria to see which ones are most likely to solve the said problem. The community was then facilitated to generate its own Community Action Plan to deal with the specified priority problems. The problems, problem analysis and top ranked opportunities, together with the associated Community Action Plan are presented over the next few pages and constitute the communities own plans to solve their problems.

From the findings across the 5 sites, three types of interventions seem necessary to bring more Kenyans out of poverty.

- Those that communities can organize to get done by themselves
- Those that the community can help to organize with some outside help
- Those that the community can do nothing about and for which they must depend entirely on the outside. Many of these relate to the policy environment and action, or inaction, by government.

Economic analysis was undertaken on the community's proposals as laid out in their Community Action Plans. Table xx presents the economic analysis of what would happen to incomes in the different types of households if some of the proposed actions were taken. Different interventions have different impacts on the different types of households. In Gunga, for example, improvements in maize cultivation benefit the poor, but benefit the wealthiest cluster the most since they have larger pieces of land, and larger area under maize. In another site, Geta in Nyandarua, reconstruction of a road raised income for all groups, but especially for the already relatively wealthy households that had more land to put under horticultural production. Throughout the country this type of thing where development helped the already wealthy the most exist. It shows the need to think through carefully what exactly pro-poor policies are. But investment in improving access to, and the quality of water were more beneficial to the poorer households who travel shorter distances, have women with more time for alternative income earning activities

(like trading omena in Gunga), and reduce medical costs. Financial services for small businesses also were pro-poor.

Table 26: Cumulative Change from Addressing Problems Identified in Gunga CAP

Household Group	**1**	**2**	**3**	**4**
(1) Baseline Household Income	**44,447**	**100,327**	**173,241**	**400,632**
Improved Maize Cultivation	2,365	2,032	3,595	17,481
Omena Trading	2,136	3,250	11,475	0
Clean Drinking Water	1,334	910	850	375
Improved Malaria Control	1,719	1,750	2,550	2,000
Total of Four Problems	**7,554**	**7,942**	**18,470**	**19,856**
(2) New Net Household Income	**52,001**	**108,269**	**191,711**	**420,488**
Percent Change, (1) to (2)	17%	8%	11%	5%

Source: Authors computation

Problem 1: Low Food Production

Root Causes

Inadequate rainfall
Crop pests and diseases e.g. army worms, locust invasion
Soil erosion
Poor extension services
Inadequate farm implements
Livestock diseases and wildlife menace (hippos, birds)

Coping Strategy

Drought resistant crops
Sale of livestock to buy food

Sale of traditional brews, fish, sisal fibres and ropes, charcoal and firewood, to buy food

Community Action Plan for Low Food Production

	Ranked Opportunity	Action Needed	Resources/ Materials	Who Will Provide	Time To Begin	Follow Up
1	**Irrigation To Sustain Crop production**	Form a committee	pipes, pump, tanks, fuel, oil, barbed wire, cement, labour, capital and a site	Community, Ministry of Agriculture	August 1998	Assistant Chief
2	**Provide extension Services**	Establish fund for travelling expenses	extension officer	Government	August 1998	Peter Magolo and Robert Odoyo
3	**Establish Cattle Dips**		cement, dip wash, stones, barbed wire, ballast, sand, timber, and iron sheet			
4	**Credit for Farm Implements**	Community start account	Bank	Community	Aug. 1998	Gunga Development Committee
5	**KWS Liaison on Hippo Control**	Form committee, raise money	visit KWS, Homa Bay	Community	Aug '98	Martin Odeka and Asst. Chief

Link With PRSP

The PRSP Matrix for Migori also refers to the high cost of farm inputs/implements, the provision of extension services, inadequate livestock health services, lack of capital, soil erosion

Problem 2: Low Income

Root Causes

Lack of credit
Lack of title deeds
Inadequate farming equipment
lack of fishing equipment
theft of equipment

Coping Strategy

Petty trade in fish, firewood, and sisal building poles
Selling sisal rope and thatching grass
Selling traditional brew
Grain trading

Community Action Plan For Low Income

	Ranked Opportunity	Action Needed	Resources/ Materials	Who Will Provide	Time To Begin	Follow Up
1	**Establish Credit Scheme to buy Fishing Gear**	Open bank account.	Funds	Members of fishing group	Aug '98	Group members, Francis Ojola
2	**Issue Title deeds**	Consult Sori Lands Officer	Funds to travel to Migori	Gunga Devpt. Commt. Chief, harambee	Immediately June 25 1998	Development Committee
3	**Provide Cold Storage for fishing industry**	Fishing groups meeting	Site, link to donors	Community, MP donor link	Immediately	Fishing groups, F. Ojola and councilors
4	**Open a Quarry**	Community meeting	Site and labor, machines	Community, donor	Immediate	Gunga Devpt. Committee

Link With PRSP

The Migori PRSP matrix refers to lack of capital/credit, lack of title deeds and problems in the mining industry,

Problem 3: Lack of Clean Drinking Water

Root Causes

Contamination of drinking water
Boiling water is hard work, and some do not boil long enough
Failure to harvest rain water
Inadequate water wells

Coping Strategy

Use lake water
Harvesting water in drums if have a mabati roof
Treat lake water

Community Action Plan For Lack Of Clean Drinking Water

	Ranked Opportunity	Action Needed	Resources/ Materials	Who Will Provide	Time To Begin	Follow Up
1	**Using Boiled Water**		Firewood, sufuria/pot	Households	On-going	Asst. Chief, Gunga Devp. Commt.
2	**Increase shallow wells**	Community meeting	Drilling machine, skilled labor, money, hand pumps,	Community, donors, Lake Basin Devpt Authority	June '98	Asst Chief and Devp.Commt
3	**Rehabilitate Shallow wells**	Devpt committee meet	Funds, skilled and unskilled labor, pipes	NGO's churches, LBDA		Asst Chief and Devp.Commt
4	**Rain water harvesting**		Mabati roof, gutter, tank	households	Jun '98	Will form water groups
5	**Pump water from Lake**		Pump. Pipes, fuel, tank, skilled and unskilled labor	Community, administration/ government or donors	Aug '98	Asst Chief and Devp.Commt DDC

Link with PRSP

The Migori PRSP Matrix refers to inadequate water storage/catchment and treatment facilities, unprotected water sources and catchment areas. Adopting the Gunga Community Action Plan would address the problems raised in PRSP.

Problem 4: Human Diseases

Root Causes

Contaminated water. Mosquitoes. Poor diet
Poor sanitation, especially the lack of pit latrines

Coping Strategy

Boil drinking water, Campaign to build pit latrines
Better food preparation, Increased use of mosquito nets
Reduce sexual contacts with strangers and use condoms

Community Action Plan For Human Diseases

	Ranked Opportunity	Action Needed	Resources/ Materials	Who Will Provide	Time To Begin	Follow Up
1	**Use Clean Water, boiled or treated**	Create Awareness, dig more shallow wells	Fuel/firewood, chlorine, drilling machines, site and water pumps	Public Health officers, Netherlands project, Lake Basin , Ministry of Public Works	ongoing	Asst Chief, community representative go to Public Health Office
2	**Construct and use pit latrines**	Create awareness, construct latrines	Iron sheets, sand, cement, timber , wire mesh, mould and labor	CARE Kenya and Netherlands Project	Aug. '98	Asst. Chief call *baraza* + councilor
3	**Grow more food varieties**	Create awareness of need for balanced diet	Different seed types, extension advice	Individuals, govt. Ministry of Agriculture	Sept' 98	Mr. Ochuonyo to contact DAO
4	**Sick people to go for treatment**	Create awareness	Health Officers	Govt. hospital at Sori	June '98	Asst. Chief
5	**Public Health education**	Community meeting	Health officers	Ministry of Health	ongoing	Asst chief to see Public Health Officer
6	**Change some cultural practices (*Tero*, eating at funerals, churches to hospitalize)**	Create awareness	Public gatherings, funerals	Asst Chief and village elders	immediately	Administration/ Asst. Chief

Link To PRSP

The Migori PRSP Matrix talks about inadequate and untreated water, and that cost sharing in medical facilities makes them inaccessible to the poor. Inadequate drug supplies in medical facilities and poor remuneration of medical personnel also were raised.

Synthesis Of Findings From PAPPA

In the spirit of keeping a focus on poverty, even though most people in the study sites qualify as poor, the summary information is based primarily on the poorest group in each area.

What Poor People Do For Money

Poor people depend more heavily than the non-poor on income from agricultural sources. Across Kenya the poor engage in agricultural production, but either their land holdings or the technologies used limit them to subsistence production in all but the best endowed areas (like Geta). They all grow maize, but are net purchasers from the market meaning they would be better off with lower prices for the staple food.

Table 27: Household Incomes Among The Poor

	Household Income In Poorest Cluster (Monthly Figures)				
	Mwea	**Olgulului**	**Geta**	**M'bwaka**	**Gunga**
Income Source					
Crop	1,128		4,598	2,125	1,504
Livestock		3,937	883	323	1,467
Salary		782		597	
Off-Farm	3,845	1,012	1,279	2,104	733
Other		513		916	
Monthly Income	**4,973**	**6,244**	**6,760**	**6,065**	**3,704**
US $ per Capita/Year	**122**	**153**	**193**	**149**	**106**

Source: Authors computation

Salary income is not a feature of the poorest households. They do supplement their agricultural incomes with activities off their own farms, most commonly working on other peoples farms particularly in Mwea, Geta and Gunga. Many of them also are involved in whatever small-scale off-farm business activities their area has to offer; small scale trade in fish, and products like firewood and thatch in Gunga, making and selling brooms from coconut leaves in M'bwaka-Kikomani. Livestock trading is important in the Kajiado site.

Poor households would be direct beneficiaries of increased agricultural production and commercialization i.e. production for the market, as they are the store of currently excess labor. The small-scale trading activities they undertake all would benefit from overall economic growth, but in almost al cases could be boosted by the judicious application of credit that would allow the businesses to grow. **Access by women to small-scale business is an important route to increased income in the majority of sites.** However they are limited, in Gunga for example, by the amount of time taken up undertaking household chores like fetching water and cooking.

Getting a salaried job is the most direct way of bringing the poorest households out of poverty. In all the areas having a household member with a job was a key distinction between the poorest and wealthier households. The scale of operation of their informal business activities was another.

Jobs were important, but across all the sites **increases in the production and productivity of agriculture was the single change with the most direct benefits to the largest number of the poorest households.**

What Poor People Do With Their Money

Food, mainly maize, dominates household expenditure in the poorest households. Across the sample maize constitutes 16 percent or more of household expenditure (including the value of own production), with higher percentages among poorer households. The impact of policies that raise the price of a staple foods like maize and sugar can be seen and measured in all the PAPPA sites. They are not conducive to improving the lives of the majority of poor Kenyans most of whom purchase more maize in a year than they sell.

Table 28: Household Expenditure In Poor Households

Household Expenditure (Monthly Figures)	**Mwea**	**Olgulului**	**Geta**	**M'bwaka**	**Gunga**
% Of Households	32	76	34	43	51
Avg. Family Size	7	7	6	7	6
%Expenditure on Food	48	77	59	66	64
Expenditure					
Food	3,072	5,642	2,931	3,991	5,290
Non-Food	2,140	289	1,440	925	1,241
Education	650	230	514	864	1,333
Health	500	1,175	124	250	450
Total Expenditure	**6,362**	**7,336**	**5,009**	**6,030**	**8,314**

Source: Authors computation

Non-food expenditure, even among the poorest households across the sites, was dominated by the same items, – fuel for cooking and lighting, clothes and footwear, soap and travel - all of which are subject to taxation. . It is possible to compute the cost of these taxes on the different income groups using the PAPPA database and to measure the welfare effects of changing them.

Primary education in Kenya is free but households spend significant amounts to keep their children in school. The monthly figure, for the poorest households in our sample, ranges from a low of Ksh 230 per month in Olgulului to a high of Ksh 1,333 in Gunga. The poorest households are the homes of most of those who drop out. Children

drop out of school, or discontinue their education, primarily due to poverty. And the bulk of the over 50 percent of Kenya's population living in poverty are children. Children who are likely to remain in poverty if they do not get a good education.

Health was another large item of expenditure with malaria being the most common illness everywhere. Particularly among the poor and children. Fighting malaria is becoming a rallying call around the world. The same should happen in Kenya. Water borne diseases also were prevalent, particularly in Mwea, M'bwaka and Gunga**. The provision of, and access to clean drinking water, will be an important indicator of our progress toward poverty alleviation and improvement in the quality of life of poor Kenyans**.

The **Water Department** within the Ministry of Environment and Natural Resources spends **84 percent of its budget on salaries and allowances** for 5,198 staff at the district level. Reopening 2 boreholes in Gunga, and protecting springs in M'bwaka can be done for less than Ksh 20,000 to 50,000 per site.

Increasing income is not the only way to reduce poverty. Reducing household expenditure is another. The interventions mentioned above reducing the cost of food, lowering taxes on non-food items, reexamining costs in the education system, and interventions in health and the provision of water that can reduce expenditure, morbidity and drudgery all can make a contribution to reducing poverty from the expenditure side.

If communities had more of a voice as to how money spent in their name were spent, far less of the expenditure would go on wages to public sector workers who are not provided with the tools to work. The extension service is a typical example where 92 percent of the recurrent vote of district agricultural extension services goes on salary and allowances.

Implications of Poverty Reduction in Kenya

The preceding section gives a snap shot into the lives of typical Kenyans in 5 representative sites around the country generated thorough a process of economic analysis and participatory rural appraisal. The picture given has the following highlights:

- In all parts of the country, there is a mix of poor and rich people. Even in the poorest of places there is a proportion of well off households. This wealth can be based on the ownership of, or access to agricultural assets such as cattle and private water sources in Olgulului, Kajiado, more land and access to irrigation water in Mwea, more intensive cropping in Geta. But access to off-farm income, particularly a salary - even in the relatively low paying civil service- was a guarantee to access to the higher income groups. Public sector workers are not among the poor by Kenyan standards.

- Access to water featured prominently as a priority problem in all areas. People are willing to help contribute labor, running expenses, management time and even land to improve access to water in their communities

- The absolute amount spent on food does not vary much across income clusters in rural Kenya. However food expenditure ranges from half to two-thirds of household expenditure among the poorest households. In the poorest pastoral communities food - including the value of milk consumed - constitutes 77 percent of household expenses. In all areas maize was the main purchased foodstuff. Although the poor in all sites grew some maize, yields and productivity were low.

- The costs of keeping children in school is a major strain on all income groups. However while wealthier households struggle with secondary and college fees, the poor cannot meet the costs of primary education. High dropout rates result, particularly among girls.

- Malaria is Kenya's biggest health problem followed by intestinal and respiratory problems. Typhoid, due to the drinking of untreated water that subsequently is not adequately boiled is on the increase. Relatively simple measures would reduce the incidence of both typhoid and malaria. Everyone knew about HIV/AIDS and how to avoid it but in all communities people were unwilling to discuss it either in public meetings, or in private interviews in their homes

- Inadequate infrastructure is leading to the loss of numerous opportunities to make people wealthier and enjoy a higher quality of life. Road and water infrastructure were the priorities of poor people.

- Poor and unaccountable leadership and an inability to solve simple disputes have resulted in a lack of well-run community institutions that seemed to affect all sites. A strong rural Kenya needs strong institutions. **Strengthening rural institutions should be a core element in our poverty reduction strategy.** One way of doing this is to devolve decisions about how public funds are to be spent to lower and lower

levels of government, and ultimately out of government hands into the hands of the community and its elected representatives.

Link To Poverty Reduction Strategy Paper

Kenya has just completed writing a Poverty Reduction Strategy Paper that involved wide ranging consultation within government, and between government, communities in districts, civil society and the private sector.

The process generated a lot of anticipation among Kenyans that, together with their government they would embark on a serious effort to combat poverty. This anticipation was heightened by District consultations where groups met to analyze the causes of poverty in their area, and to design strategies to deal with those causes. The outcome of the district consultations for Migori District - where the PAPPA site, Gunga falls is presented below.

Monitoring and evaluation is an integral part of the PRSP. Monitoring needs to use a range of methods to deal with the different types of information needed to check that Kenya is moving in directions that will reduce poverty. The menu of methods must for example, be able to check that priorities identified at the district level actually receive funding for priority implementation. Traditional budget monitoring processes supplemented by civil society and private sector involvement in ensuring that disbursements actually reach the district/implementation level are envisioned.

To know whether funds spent are actually improving lives and reducing poverty formal procedures for receiving feedback from districts and communities are being designed. Part of this feedback process will use participatory methods such as were used as part of the PAPPA process. These exercises have been used to great effect in helping Uganda fine tune its own poverty reduction strategy and make decisions like adopting a policy of universal, free primary education.

Outcomes are the ultimate test of a poverty reduction strategy. These can only be measured by undertaking large surveys of the kind undertaken by the Central Bureau of Statistics of which the Welfare Monitoring Survey is typical. KAMPAP is another example of a large national survey although the sample of 1,500 households is dwarfed by the CBS's 12,000 household sample. Tegemeo will be offering its skills and methods to the national effort aimed at monitoring implementation of PRSP and alleviating poverty. Civil society, the private sector and research institutions have been invited to join with government in designing the Monitoring and Evaluation strategy of the PRSP.

Poverty Reduction Strategy Paper - PRSP Migori District Issues per Sector/Sub-Sector

Sector	Sub-Sector	Issues
Agriculture and Rural Development	Crop Development	• High cost of inputs • Inadequate marketing channels
	Livestock Development	• Inadequate livestock extension services • Inadequate livestock marketing channels • Inadequate livestock health services
	Rural Water	• Inadequate water and storage and treatment facilities • Unprotected water sources and catchment areas
	Lands and settlement	• Lack of clear land policy • Lack of title deeds Squatter problem
	Environmental Management	• Droughts and floods Soil erosion and degradation • Poor environmental sanitation
	Co-operatives	• Mismanagement and untrained personnel • No farmer Co-operatives
	Food Security	• Outdated farming practices • Lack of bulk storage facilities
Physical Infrastructure	Roads	• Inadequate classified, feeder and minor road network.
	Energy	• Inadequate coverage of the district by the national electricity grid
	Transport and Communications	• Inadequate coverage by both telephone and postal services. • Non-functional steamer and railway services
	Water Works	• Inadequate supply of potable water.
Trade, Tourism and Industry	Industries	• High cost of capital Inadequate research • Exploitation from foreign investors Low level of rural industrialization.
	Tourism	• Neglected tourist attractions. • Communities not benefiting from tourism • Lack of social amenities in the like hotels and inadequate marketing • Inappropriate institutional arrangements
	Trade	• High taxation Lack of capital
	Small Scale Industries	• Absence of small scale industries Marketing
	Mining	• Lack of capital Inappropriate mining technology • Lack of mining skills Lack of proper mining research
Human Resource Development	Education	• Child labour • Inappropriate cultural attitudes • Inappropriate education system • Inadequate physical and learning facilities • Expensive education due to cost-sharing • Understaffing
	Health	• Lack of adequate, committed and qualified staff Poor remuneration • HIV/AIDS • Inadequate drug supplies • Cost-sharing too expensive for the poor
	Shelter and housing	• Lack of access to proper housing due to expensive building materials • Squatters (homeless people) Poor planning
	Labour, Social Security	• Unemployment
	Population	• High population growth rate
Public Safety, law and Order	Provincial Administration	• Corrupt administrators • Lack of training opportunities for administrators • Too many harambees

Conclusion

Kenya is embarking on a national effort to reduce poverty. Currently 56 percent of Kenyans live below the poverty line. This number has actually increasing over the last 4 years despite billions of shillings spent by government, donors, NGO's and the private sector to reverse the trend. The results presented in this paper confirm that income in rural Kenya is on a steep downward trend.

Measuring incomes, and decomposing it into its component part is the first step toward understanding poverty in Kenya. And understanding poverty is the first step toward designing interventions, strategies and programs to reduce it. In this paper Tegemeo has given a data based analysis of income in rural Kenya. It has also gone one step further b highlighting different methods of measuring and understanding poverty, and concluded that a mix of quantitative and participatory techniques give a richer set of results than either method on its own.

The findings in this paper show that income in Kenya are unequal, whether across different zones, or across households in the same zone. The regional income differential is a familiar story and has been with us since Sessional Paper No 1 of 1965. But perhaps more of a challenge is the fact that within single villages, the rich and poor live side by side. But this information provides a sign that there is hope. Analysis of the differences between rich and poor households may give some clue as to what strategies can be adopted to raise income and opportunity among the poor. If their neighbors can do it, are there things that they also can do?

The information presented in this paper suggests that some of the differences can be dealt with in a fairly short time. Wealthier households use more fertilizer and improved seed that poor households can adopt fairly quickly if the extension information and finances were available. But some of the difference between the wealthier and poorer households are more difficult to deal with. Wealthier households are headed by individuals that have been in school longer, own more land, and often are men. Investments in improving agriculture can have impacts that raise the income of all types of households. But the feasible changes in income are limited in the amount by which they can really change income.

The biggest opportunities for quickly changing incomes lie in the range of off-farm activities they can engage in. A salaried job is the most direct predictor of whether a house is in the wealthier income classes or not. Even relatively low paying jobs make a big difference in a country where average monthly household incomes are Ksh 11,500 per month. Off-farm business activities also can contribute significantly to household income. Average incomes from informal business activities average Ksh 2,048 per household per month but range from Ksh 4,209 per month among the wealthier households, to Ksh 534 in the poorest households. Informal income earning activities are important, but the type and scale of activity really matters.

Data presented make clear that income from off-farm sources reduced quite significantly between 1997 and 2000 and was responsible for most of the income lost over the period. Focusing on increasing income from the off-farm business activities Kenya undertakes is a good candidate for inclusion in a poverty reduction strategy.

Poverty can also be measured through participatory techniques that try to understand poverty from the perspective of those living in it, rather than just in terms of the numbers and poverty lines that economists love. A synthesis of a technique that combines quantitative and participatory methods was able to enrich the insights gained from the nationwide survey with insights from deeper analysis in a single, or several villages. Whereas quantitative household surveys are somewhat extractive in nature, the participatory work was able to give something back to the communities where it was used. Each community was left with a Community Action Plan, there own plans for how to solve the poverty and problems they live with. Some of the interventions identified need some assistance external to the village, but for most of the identified measures, there was a large measure of self-reliance. The community committed to do most things for themselves.

Kenya is embarking on a Poverty Reduction Strategy. Much of the backing and funding for it comes from donors and government. But government, and the donors that support it cannot reduce poverty in Kenya on their own without harnessing the energies and ideas of the people. This realization lies at the heart of the PRSP process. Government will join hands with the private sector, civil society and the people - in rural communities, commodity sectors, district for a etc. wherever they are to design strategies that can work. The research community also has been invited to lend a hand. This paper demonstrates the types of analytical work, methods and rich database Tegemeo is putting at the disposal of Kenya within the framework of the PRSP. An extended example demonstrated that Tegemeo's database was able to capture similar concerns and strategies as were generated as part of the PRSP consultations in Migori District.