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DEVELOPING INCOME PROXY MODELS FOR USE BY THE USAID MISSION IN KENYA: A TECHNICAL REPORT

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Tegemeo Working Paper 7

November 2003

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Developing Income Proxy Models for use by the USAID Mission in Kenya: A Technical Report

By

David Tschirley and Mary Mathenge

I. Introduction

Governments, donors, and NGOs in developing countries spend billions of dollars every year on efforts to improve the well-being of rural households. Most of these interventions have the ultimate goal of reducing poverty, and many include specific objectives of increasing household incomes from specific activities such as microenterprise, cash cropping, food cropping, or livestock. Since an accurate assessment of these outcomes is costly and time-consuming, much research has attempted to identify simple indicators which are correlated with the variables of interest.[1] The income proxy models developed in Kenya are one method in this large and expanding toolbox of low cost approaches to monitoring otherwise complex indicators of household welfare.

The work in Kenya builds on and improves methods developed earlier in Mozambique (Tschirley, et al. 1999) and applied by NGOs there. The purpose of the models as currently developed in Kenya is to provide donors, government agencies, and other interested organizations with a low cost method to generate estimates of total household income, broken down by eight different income sources. In addition to generating estimates of mean incomes on a geographically disaggregated basis for monitoring purposes, the model results will be useful for a series of basic descriptive analyses to be described below.

This paper details the specific procedures utilized to develop the income proxy method for the USIAD/Kenya mission, reports on the performance of the method, and brings together in one place each part of the package needed to implement the method. The next section provides general background on income proxy methods; section III reports briefly on the Tegemeo/MSU Tampa full income survey that formed the basis for development of the proxy method; section IV provides details on model development, including definition of income components, the types of proxy variables tested, and the performance of the models; section V assesses model performance, and section VI touches on how the models can be used. A companion document (Developing Income Proxy Models for Use by Title II-funded NGOs in Kenya: A Technical Report for NGOs and USAID/Kenya) provides similar documentation for the modeling effort undertaken with NGOs.

[1] See, for example, Daniels 1999; Glewwe 1990; Glewwe and Kanaan 1989; Grosh and Baker 1995; Hentschel et al. 1998; Jalan and Ravallion 1999; Little 1997; Minot 2000; Morris et al. 1999; Ravallion and Lokshin 1999; Riely et al 1999; Rose 2000; Rose and Tschirley 2000; Sahn and Stifel 2000a; Sahn and Stifel 2000b; Swindale and Ohri-Vachaspati 1999; Takasaki and Barham 2000l; Wolfe and Frongillo 2000; World Bank 2001;

II. Income Proxy Models: What Are They and How Can They Be Useful?

A. Background

An income proxy model is one part of a package of procedures that NGOs, donors, governments, or research institutions can use to monitor rural household income and income components using easy-to-collect proxy variables. The model is a set of algebraic equations that relate these proxy variables to components of income:

$$\hat{Y}_i = a_i + b_{i1}X_{i1} + b_{i2}X_{i2} + \ldots + b_{in}X_{in} + e_i$$

where,

$\hat{\ }_i$	is estimated income from component i,
a_i	is a constant (or intercept) term for income component i,
$b_{i1} \ldots b_{in}$	are the coefficients (fixed numbers) that quantify the relationship of each proxy variable to income component i,
$X_{i1} \ldots X_{in}$	are the selected proxy variables for income component i, and
e_i	is a random error term.

Taken together, the various components in the model sum to total household income:[2]

$$\hat{Y} = \sum_{i=1}^{C} \hat{Y}_i$$

where,

$\hat{\ }$	is estimated total income,
$\hat{\ }_i$	is estimated income from component i, and
C	is the number of income components.

These algebraic relationships are developed using standard "ordinary least squares" econometric techniques applied to a household data set which contains detailed data on household incomes and the proxy variables. Once this detailed data set is collected and the model is estimated, one needs only to collect the proxy variables to obtain estimates of income components and total household income. These simple *proxy surveys* will typically be conducted once a year, or however often the institution wishes to track household income. The much more detailed and time consuming *income survey* needs to be done once at the beginning of the project cycle and preferably again at the end of the cycle for validation

[2] If desired, the models could be developed to return *per capita* household income, as opposed to total household income.

purposes. The complete package which defines the income proxy methodology includes 1) sampling guidelines for the periodic proxy surveys, 2) a model questionnaire for these surveys, 3) the set of econometric models relating the proxy variables to household income and income components, 4) SPSS/Windows syntax files based on these models that use the proxy data to generate the quantitative income estimates, and 5) a manual for operating the package.

The usefulness of an income proxy methodology derives from the importance of household income as an objective of development activities: an important overall development goal in nearly every developing country is the reduction of poverty and improvement in the incomes and well-being of rural households. Thus, measurement of household income is one logical choice for monitoring the effects of policies and programs oriented towards accomplishing this goal.

B. Monitoring or Impact Evaluation?

The econometric models in the income proxy methodology are designed to capture the *association* between income and the proxy variables, and to return as accurate a prediction as possible. As such, they can be used directly to *monitor* the types of economic activities that households engage in, and the incomes they derive from these activities. The models themselves are not designed to allow conclusions regarding cause and effect; to use these models for *impact evaluation* (for example, to measure the impact of an NGO's agricultural production and marketing assistance on agricultural and overall household income), they need to be integrated into an overall approach which includes the following elements:

- A sampling design that distinguishes between participants (the target population for the intervention being evaluated) and non-participants (the non-target population),
- A baseline survey conducted prior to the beginning of the intervention, distinguishing between likely participants and likely non-participants,
- The collection of complementary data regarding the physical, economic, and social environment of the participating and non-participating households.

It is beyond the scope of this paper to go into detail on impact evaluation;[3] suffice it to say that, within such an integrated approach, use of income proxy models can allow more frequent monitoring (because it will be less costly and less time consuming), provide a richer set of monitoring results covering the range of the households' economic activities, and reduce the cost of the impact evaluation.

[3] For a good introduction to this topic, see Ravallion, Martin (1999). "The Mystery of the Vanishing Benefits: Ms. Speedy Analyst's Introduction to Evaluation". Policy Research Working Paper ..., Washington, D.C., World Bank.. This can be downloaded from the web by going to www.worldbank.org/research/, choosing "poverty", then searching for "Ravallion" under "Policy Research Working Papers".

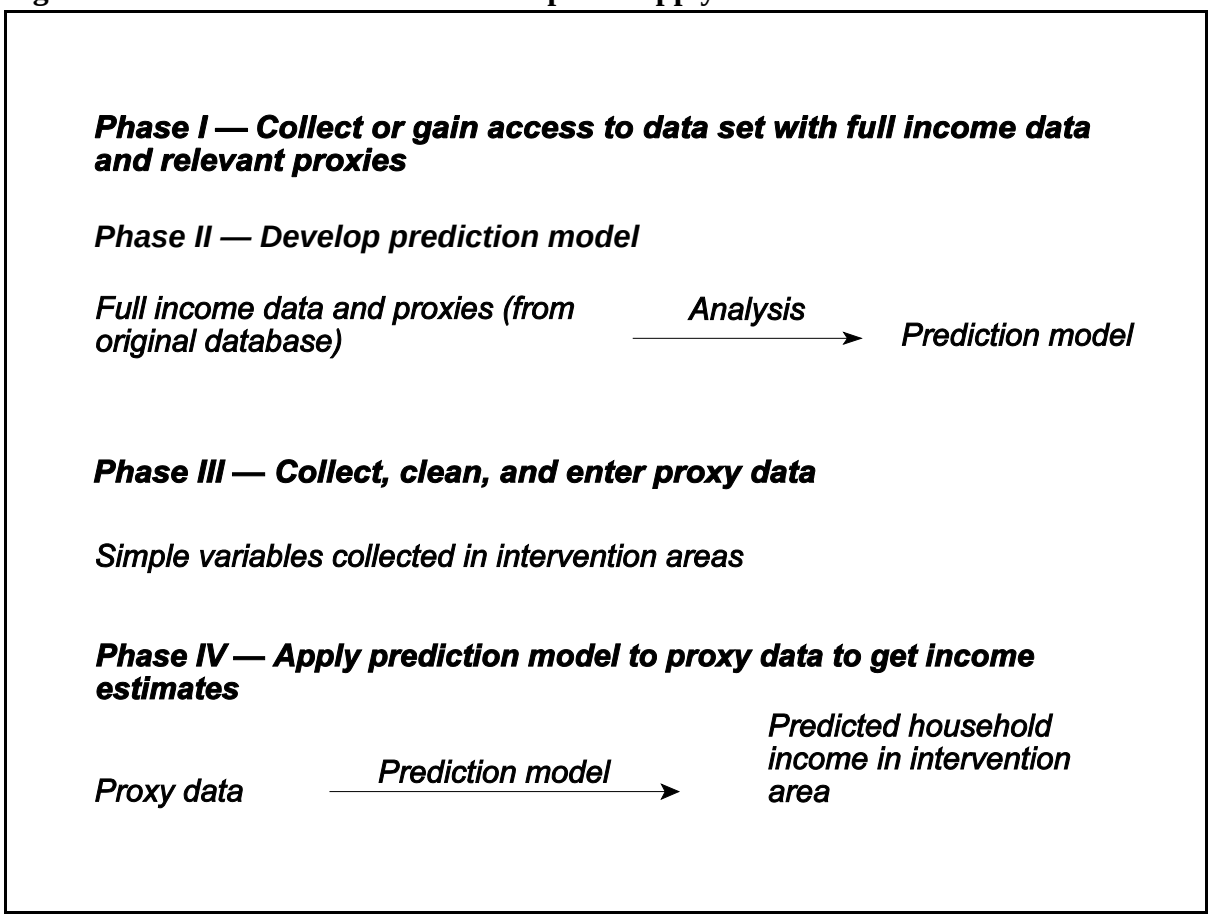
C. What Steps Are Needed to Develop an Income Proxy Model?

Figure 1 provides an overview of the process for developing and utilizing an income proxy model. Once the original, detailed data are collected and the prediction model is developed (Phases I and II), one need apply only Phases III & IV for the remaining years of the program before collecting a new full data set to re-estimate the prediction model and perform a full evaluation of the program.

To develop the model, the analyst must work closely with users to:

1. **Understand the design and operation of the interventions that are being monitored, and the economic environment where they are being implemented**. The analysts developing the model need this type of information to define a set of econometric models that are meaningful for the user and that can be estimated with acceptable accuracy with proxy variables.

Figure 1. **Overview of Process to Develop and Apply Income Prediction Models**



2. **Define a relevant and feasible breakdown of income components to be modeled**. The preferred definition will depend primarily on the types of economic activities which

are most important in the area where the intervention is taking place. For example, in a pastoral area with little crop production, the latter may be grouped into a single component, while livestock activities might be broken into several components. In an area of heavy cropping activities where livestock is less important, the reverse might hold.

3. **As much as possible, anticipate the proxy variables that will be used to model each component**. While not every proxy variable can be defined prior to the data analysis, many can be, and identifying a comprehensive list of probable and possible proxies ahead of time will improve the modeling results. As in the definition of income components, there will be substantial similarities in the definition of these variables across users, but if the income components are not identical, neither will the proxy variables be.

4. **Design and conduct a detailed *income survey*** that will provide the data to estimate the models. In the case of the models developed for USAID/Kenya, this survey was conducted by Tegemeo/MSU in 2000, and included design elements that anticipated the development of these models.

5. **Estimate the models**. The data must be entered, cleaned, organized, and then analyzed to develop the prediction models.

6. **Develop a model questionnaire for the proxy surveys**. Defining the models involves defining the most efficient set of proxy variables for each income component. Once this is done, a questionnaire is designed to collect just these proxy variables in future years. These questionnaires consist almost entirely of yes/no questions, with quantification of a limited number of variables. Thus, these questionnaires are much shorter, the interviews are shorter and easier to conduct, and the data are much easier to enter and clean than a full income survey. See Annex B for the proxy questionnaire designed for the USAID Mission models.

7. **Develop a data processing routine** to convert the proxy variables into estimates of income components and total income. Tegemeo/MSU have developed a SPSS/Windows syntax file that performs this function. It is available in electronic version upon request.

D. Anticipated Time and Cost Savings from the Proxy Approach

Table 1 shows estimated time and cost savings of using a proxy approach as opposed to a full income survey. The numbers in the table are derived from Annex Table A1, which is based on Tegemeo's experience with the full income survey in 2000 and the proxy survey in 2002, and on NGOs' experience with the proxy method in 2003. The time and cost savings of the proxy approach come in all phases of the work. Questionnaire design for Phase III is limited to reviewing the model proxy questionnaire and making any small changes required for the specific circumstances (without, of course, changing the actual data to be gathered nor its structure). Tegemeo experience in 2002 and NGO experience in 2003 suggests that an interview for the simple proxy survey takes one-quarter or less time than an interview for the full income survey; total time savings in data collection will be less than this due to the fixed

costs of reaching villages and finding households within them, which is the same for each survey. The largest time savings come after data collection: due to lower data volume and simpler variables, post-coding and cleaning of the proxy data take about one-quarter or less time than the full survey, while data analysis takes about one week, compared to an estimated 3 months on a full income survey.[4]

On this basis, we conservatively estimate that the proxy survey reduce monetary costs compared to a full income survey by approximately 2/3, and elapsed time (from the beginning of the exercise to having needed results from the data) by a similar amount, from over 30 weeks to about ten weeks. Analyst time is especially scarce in most organizations, and these overall figures mask the greater savings of their time; we estimate these savings to be over 80% (Table 1, based on Annex Table A1).

Table 1. Indicative Time and Cost Savings of Proxy Approach Compared to Full Income Survey, Each Covering 1,500 Households

Item	**Estimated Cost (US$)**		**Estimated Elapsed Time (weeks)**	
	Full Survey	**Proxy Method**	**Full Survey**	**Proxy Method**
Questionnaire design	2,302	307	3.0	0.40
Data collection	43,362	23,412	7.0	7.00
Post-coding and data entry	4,721	1,180	3.0	0.75
Data cleaning	10,468	2,617	6.0	1.50
Data analysis	27,000	1,709	13.0	1.00
Total	**87,853**	**29,225**	**32.0**	**10.65**
... of which Analysts	**33,416**	**6,231**		

The proxy surveys of Phase III need be conducted only once a year, or however often the institution wishes to track household income and income sources. For validation purposes, the full income survey of Phase I survey should be conducted again at a later time and, if needed, the prediction models should be recalibrated.

It should be noted that these time and cost savings are achieved due to the up-front investment in developing the proxy models, the proxy questionnaire, and the processing routine to convert proxy variables into income estimates. These activities are all additional to what would normally be done with an income survey. Based on experience to date in Kenya, this process takes about one and one-half months of full-time work for an Analyst

[4] Though initial results for the proxy method are produced instantaneously by running the syntax file already created, results have to be reviewed for consistency and checked for outliers. This process took one week at about 50% time for a Senior Analyst on the NGO survey of 1,200 households.

and Senior Analyst. Thus, to be cost effective, and considering that a full income survey provides a richer data set for policy analysis, we suggest that the method be adopted only if it will meet critical M&E needs during at least two years, and preferably more.

III. The Tampa Data Set

The Tegemeo Institute "Tampa" survey, a joint undertaking by Tegemeo Institute/Egerton University and Michigan State University, contains about 1,500 households and is designed to be representative of 24 purposively chosen agricultural districts of the country. These districts were chosen to be representative of all but the non-marginal, largely pastoral, areas of the country.[5] For the development of the income proxy models, data from Turkana and Garissa districts were eliminated, as were several cases considered to be outliers. In all, 1,392 cases were used in this analysis.

Because the Tampa sample was not fully randomized, and because the sample size was relatively small when compared to national surveys such as the Welfare Monitoring Survey, geographical breakdowns in this report are presented at a fairly aggregated level - four zones, each comprising more than one province. Breakdowns below this level, for example in Table 3 at the district level, are legitimate for internal evaluation of the income proxy models, but should not be compared to results from WMS surveys at that level.

IV. The Model Development Process

A. Definition of Zones and Income Components

To develop the income prediction models using the Tampa data set, we first divided the country into four zones, each of which would have its own models. These zones were based loosely on agro-ecological conditions, and on the need to have sufficient sample size in each zone to ensure adequate degrees of freedom for the analysis. The zones and Tampa sample sizes are

- Coastal & Eastern, 240 households
- Western Lowlands & Transitional, 343 households
- High potential maize zone, 399 households
- Western & Central highlands, 410 households

These zones are meant to be representative of the non-marginal agricultural areas of the country; they exclude the northern arid zone and the Marginal Rain Shadow, which together had only 120 households in the Tampa sample.

After defining the four zones for modeling purposes, it was necessary to divide household income into a workable number of meaningful components. Conceptually, income can be

[5] See Argwings-Kodhek et al (1999), "How Can Micro-level Household Information Make a Difference for Agricultural Policy Making? Selected Examples from the KAMPAP Survey of Smallholder Agriculture and Non-Farm Activities for Selected Districts in Kenya," for more background on the methods used in the Tampa Survey.

broken into a very large number of components; the specific components chosen should be a function of their relevance for understanding rural households and the rural economy, and the accuracy with which they can be predicted. For a given level of desired accuracy in the estimate of total income, estimating more income components will require the collection of more proxy variables. At some point, the number of variables collected becomes excessive given the fundamental objective of the proxy approach, which is to reduce the cost of obtaining defensible estimates of household income. The analyst's challenge is to define a set of components which strikes a balance between accuracy, richness of information, and the amount of data collection and processing required.

After considering these issues, and based on a desire for the models to generate insights on the importance of farm vs. off-farm incomes and, within farm income, to highlight differences in incomes from marketing and in-kind incomes from home consumption, we chose eight income components:

1. retained cereals & tubers
2. sold cereals & tubers
3. retained fruit & vegetables
4. sold fruit & vegetables
5. "industrial" crops (all crops other than cereals & tubers and fruits & vegetables)
6. all livestock and livestock products
7. informal off-farm incomes (informal wage labor and microenterprise activities, including jua kali)
8. formal wage labor (salaried labor) & remittances

Summing the values of the eight components gives total household income. Across the four zones, these eight components required 32 models, which we call the zonal models.

B. Types of Proxy Variables used in the Models

In attempting to estimate each of these components, emphasis was placed on identifying proxy variables that would be straightforward to collect and process, and which had strong logical and empirical links to the level of income from the component. Seven general types of variables were used in the models:

- Measures of the intensity of involvement in the activity. Measures of intensity varied by component, but for the agricultural components typically included the number of items within the category that the household produced (for example, the number of food crops that the household cultivated), and the number of items that it sold (or whether it sold any, or not). For off-farm components, this set of variables generally included the number of people involved in the activity (informal off-farm or salaried labor & remittances), and the number of months in the year in which someone was involved. This set of variables also included indicators of the specific nature of involvement in the activity (e.g., what general type of wage labor, or what type of informal business activity)

- Production function variables. These were the same for all cropping activities: total acres owned (rather than the more difficult to collect acres in specific crops), use of fertilizers (yes/no), and hiring of labor (yes/no).

- Selected quantitative variables. Quantitative variables are more complex to collect and process than typical proxy variables, but are needed because production levels can fluctuate substantially from year-to-year based on rainfall and other factors. By quantifying the production of the most important food crop and cash crop, these quantities can themselves proxy for yield levels of other crops within their category. This should substantially improve the performance of the method over time. We used five quantitative variables in the models: the quantity produced of the "most important" food crop for home consumption, the quantity produced of the food crop that gave most sales income, the quantity produced of the industrial crop that gave most sales income, the quantity produced of the "most important" fruit or vegetable for home consumption, and the quantity produced of the fruit or vegetable that gave most sales income. By allowing the households to specify their "most important" crop in these various categories and quantifying that, the models should do a good job capturing the effect of changing cropping patterns in rural areas o the country.

- Farmer assessment of the crop harvest. This set of variables includes adverse event variables for the crop production components, such as damage from several sources (yes/no), the number of crops that were completely lost due to any problem, and the farmer's overall assessment of the quality of the year's harvest. These variables will help the models capture year-to-year changes in weather and pest problems.

- Household characteristics, such as schooling of the head of household, whether the household is female-headed, and the estimated value of non-land assets held by the household.[6]

- Household ranking of the relative importance of the income source compared to other sources.

- Interaction terms. We made very liberal use of interaction terms to get maximum value out of the variables used. For example, by interacting the number of months that anyone in the household earned income from any informal off-farm activity (a simple yes/no question) with yes/no indicators of the type of activities that the household was involved in (also yes/no questions), we obtained a proxy for the number of months worked in that specific activity; this variable, and others like it, was quite useful in several of the models.

[6] This proxy variable is generated from a regression using simple yes/no responses to the ownership of a set of 15 assets. Thus, it is not necessary to collect number owned and value of a large set of assets to obtain this variable.

C. Improving the Zonal Models

Evaluation of the performance of the 32 zonal models revealed that, while they performed quite well predicting income levels from the eight sources in each zone, they substantially underestimated the importance of off-farm incomes for the lowest income households. These models estimated the off-farm income share (the sum of components 7 and 8) of the poorest 20% of households at only 9%, while the actual income data showed the share to be 33%. Given the importance for policy purposes of knowing the relative importance of farm and off-farm incomes for rural households, especially the poorest, we considered this underestimate to be a serious problem. To correct this shortcoming, we chose to use information about expected income levels (from the zonal models) to estimate two conditional models:

1. Re-estimate each of the eight component models by quintile of predicted income from that component (predicted from the zonal models). For example, income from retained cereals and tubers was estimated for each of the five quintiles of predicted income from that source. This procedure generated 40 models (5 quintiles for each of 8 components), and are called the *component income quintile models*..

2. Re-estimate each of the eight component models by quintile of estimated total per capita income from the zonal models. In this approach, each of the eight components was estimated for each of the five quintiles of predicted total household *per capita* income. This procedure also gave a total of 40 models, which we refer to as the *per capita income quintile models*.

We expected these two conditional approaches to help resolve the problem we had identified because they estimate models for groups of households that are relatively homogeneous in terms of incomes (the five quintile groupings based on predicted income levels from the zonal models). If the zonal models predict incomes with substantial accuracy (which they do), then the conditional models are very likely to provide better estimates than the zonal models, as will be seen in the next section.

V. Model Performance

A. Internal Performance Evaluation

Our evaluation of the models' performance will focus primarily on checks internal to the Tampa data set - how well the models predict income and income shares as calculated in that data set, and examined from a number of perspectives. Specifically, we will look at four dimensions of performance:

- How well the models predict income levels over space,
- How well they predict income sources nationally,
- How well they predict poverty rates and depth over space,
- How well they perform in tabular analysis by income quintile, and
- How well they perform in multivariate analysis.

In all these internal analyses, the benchmark for comparison will be data as calculated directly from the Tampa data set.

How well do the models predict total income levels over space?[7]

Table 2 shows that each of the models explain about 85% of the variation around the mean nationally and in each of the four zones. The two conditional models perform slightly better in this regard, with most of the improvement coming in the High Potential Maize Zone.

Table 2. Explanatory Power (R^2) on Total Income, by Zone

Zone	**R-Squared (proportion of total variation in hh income explained by model)**		
	Zonal Models	Component Income Quintile Models	Per capita Income Quintile Models
Coastal & Eastern	0.858	0.860	0.860
Western Lowlands & Transitional	0.890	0.874	0.885
High potential maize zone	0.814	0.843	0.848
Western & Central highlands	0.867	0.876	0.875
National	0.850	0.863	0.866

Table 3 compares predicted to actual values of mean income for each of the four zones and the 21 districts in the analysis, calculates the errors for each model, and shows the ranking of zones and districts that each model gives. As expected, the zonal models provide more accurate estimates of incomes at the zone level, though errors are small in all three models. All models correctly rank the zones. When examining the results at district level, the second conditional model, based on quintiles of expected *per capita* income, performs substantially better than the other two, ranking 12 of the 21 districts correctly, and 18 either correctly or within one place. The other two models rank only 7 districts correctly, and have more large errors in both ranking and mean income than the second conditional model.

[7] Full model results can be found in Annex D.

Table 3. Mean of Actual and Predicted Incomes, and Income Ranking, by Model, by Zone and District

Zone/District	Calculated *per capita* Income		Estimated *per capita* Income								
			Zonal Models			Component Income Quintile Models			Per capita Income Quintile Models		
	Level (Ksh)	Rank	Level (Ksh)	% Error	Rank	Level (Ksh)	% Error	Rank	Level (Ksh)	% Error	Rank
Coastal & Eastern	15,874	3	15,781	-0.6%	3	16,068	1.2%	3	15,475	-2.5%	3
W. Lowlands & Trans.	12,703	4	12,766	0.5%	4	12,633	-0.5%	4	12,801	0.8%	4
High potential mz zone	20,647	2	20,568	-0.4%	2	20,540	-0.5%	2	20,568	-0.4%	2
W. & C. Highlands	23,292	1	23,490	0.9%	1	23,727	1.9%	1	23,569	1.2%	1
National	**18,645**		**18,681**	**0.2%**		**18,760**	**0.6%**		**18,660**	**0.1%**	
Siaya	7,412	21	8,094	9.2%	21	7,943	7.2%	21	7,620	2.8%	21
Kisumu	7,887	20	7,672	-2.7%	20	7,673	-2.7%	20	7,813	-0.9%	20
Taita Taveta	8,748	19	10,491	19.9%	19	11,071	26.6%	19	9,644	10.2%	19
Kilifi	10,228	18	9,277	-9.3%	15	9,918	-3.0%	16	10,247	0.2%	16
Vihiga	11,575	17	13,642	17.9%	17	13,681	18.2%	12	12,902	11.5%	18
Mwingi	12,748	16	11,632	-8.8%	16	12,193	-4.4%	15	12,199	-4.3%	13
Kisii	12,951	15	13,356	3.1%	13	14,082	8.7%	14	14,126	9.1%	15
Kitui	15,318	14	13,247	-13.5%	18	13,979	-8.7%	18	14,910	-2.7%	17
Kakamega	16,864	13	17,026	1.0%	12	16,667	-1.2%	13	17,010	0.9%	14
Trans Nzoia	17,325	12	16,419	-5.2%	14	17,478	0.9%	17	17,918	3.4%	12
Muranga	17,630	11	18,402	4.4%	11	18,452	4.7%	11	17,362	-1.5%	10
Machakos	17,973	10	19,787	10.1%	9	20,861	16.1%	10	17,967	0.0%	11
Makueni	18,434	9	18,458	0.1%	10	19,548	6.0%	9	19,442	5.5%	9
Bungoma	19,682	8	21,612	9.8%	6	21,461	9.0%	7	21,105	7.2%	8
Kwale	20,472	7	19,247	-6.0%	7	19,923	-2.7%	8	19,602	-4.3%	7
Nakuru	20,924	6	20,519	-1.9%	5	20,149	-3.7%	5	19,298	-7.8%	5
Uasin Gishu	21,050	5	21,493	2.1%	8	19,317	-8.2%	6	21,211	0.8%	6
Narok	22,456	4	20,463	-8.9%	3	20,599	-8.3%	3	21,088	-6.1%	4
Bomet	30,029	3	27,645	-7.9%	4	26,845	-10.6%	4	27,773	-7.5%	3
Nyeri	31,994	2	31,167	-2.6%	1	31,081	-2.9%	1	31,104	-2.8%	2
Meru	36,418	1	39,487	8.4%	2	38,665	6.2%	2	37,450	2.8%	1

Table 4. Explanatory Power (Pseudo-R^2) on Income Components, National

Income Component	Zonal Models	Component Income Quintile Models	Per capita Income Quintile Models
Retained cereals and tubers	.859	.848	.857
Sold cereals and tubers	.928	.926	.938
Industrial crops	.976	.978	.976
Retained fruits and vegetables	.631	.651	.722
Sold fruits and vegetables	.850	.818	.858
Livestock	.730	.748	.786
Informal off-farm	.592	.624	.653
Salaries & remittance	.749	.767	.781

How well do the models predict income sources nationally?

From Table 4, we see that the models are most effective predicting income components from sold agricultural production (sold cereals and tubers, industrial crops - nearly all of whose production is sold - and sold fruits and vegetables). The models are least effective with the two off-farm income components, but still predict over 70% of the variation across the two. Conditional model 2 (with component regressions conditional on expected total per capita income) outperforms the other two models in 7 of the 8 components.

How well do the models predict rates and depth of poverty?

For this analysis, we used a relative poverty line equal to the 30th percentile in the income distribution, i.e., the bottom 30% of the sample was defined as poor.[8] We calculate the headcount index to measure the rate of poverty, and the Thorbecke-Greere poverty gap with $\propto = 1$ to measure the depth of poverty. Both are standard indicators used in poverty analysis. All four models rank the zones correctly in terms of headcount index and poverty gap, and accurately reflect the relative differences between zones in these measures (Table 5). There is little to distinguish the models' performance on the headcount index, while the second conditional model performs best in poverty gap analysis, with an error less than or equal to the other two models in every zone.

[8] This current analysis is an internal evaluation of the income proxy method's results, and is not meant to compare these results to those from the Ministry of Planning and Finance (2000a and 2000b). See later in the report for a brief comparison of the two data sets.

Table 5. Income Levels and Poverty Measures by Zone, Actual and Predicted Data

Zone	Headcount Index				Poverty Gap (alpha=1)			
	Calcul-ated	**Zonal Models**	**Component Income Quintile Models**	**Per Capita Income Quintile Models**	**Calcu-lated**	**Zonal Models**	**Component Income Quintile Models**	**Per Capita Income Quintile Models**
W. Lowlands & Transitional	0.46	0.43	0.44	0.41	0.23	0.20	0.20	0.22
Coastal & Eastern	0.32	0.32	0.28	0.33	0.12	0.14	0.09	0.11
High potential maize zone	0.24	0.19	0.19	0.20	0.10	0.08	0.08	0.08
W. & C. highlands	0.21	0.21	0.16	0.19	0.09	0.11	0.07	0.07

How well do the model results perform in bivariate (tabular) analyses?

To date, there is little to distinguish the models in terms of their performance, with all four predicting very large shares of the variation in household incomes and income components, and performing well also in the headcount index and poverty gap analyses at the zonal level. The differences in performance in the models emerge much more clearly when we use their predicted values to conduct tabular and multivariate analyses. In Table 6 we present examples of tabular analysis that could be done with the original, calculated income levels, and with the predicted income levels from the three models we have specified. For each model, we rank households into quintile of per capita income, then examine income shares, the value of non-land assets, and the amount of cultivated land for each quintile. Note that, in the results for the three models, the value of non-land assets is itself a proxy variable based on a regression of simple yes/no responses to the ownership of a set of 15 assets against the calculated total value of over 40 assets. This variable will be generated directly from the simple proxy data collected in the Phase III survey.

The table shows that all three models perform relatively well estimating income shares in all but the lowest *per capita* income quintile. In this lowest quintile, the zonal models badly underestimate the share of income from off-farm, estimating this share at 9% compared to the 33% share indicated by the actual data. Both conditional models perform much better in this regard, estimating the off-farm share at 34% and 31%. Given the importance from a policy perspective of knowing with some accuracy the importance of farm vs. off-farm incomes for rural households, we consider the superior performance of the conditional models in this regard to be a key point in their favor.

Table 6. Income Levels and Shares by Source, and Wealth Indicators by *per capita* Income Quintile, by Calculated and Predicted Income

Per Capita Income Quintile	Data	Total per capita Income (Ksh)	Crop Agriculture		Livestock		Off-farm		Non-land Assets[4] (Ksh)	Cultivated Land (ha)
			Level (Ksh)	Share	Level (Ksh)	Share	Level (Ksh)	Share		
1	**Actual**	**2,962**	**1,614**	**0.54**	**371**	**0.13**	**977**	**0.33**	**53,894**	**3.2**
	From model 1[1]	**2,696**	**1,681**	**0.62**	**785**	**0.29**	**230**	**0.09**	**51,982**	**3.2**
	From model 2[2]	**3,491**	**1,682**	**0.48**	**625**	**0.18**	**1,184**	**0.34**	**62,182**	**3.0**
	From model 3[3]	**3,403**	**1,761**	**0.52**	**602**	**0.18**	**1,040**	**0.31**	**55,295**	**3.3**
2	**Actual**	**7,503**	**3,626**	**0.48**	**1,216**	**0.16**	**2,661**	**0.35**	**103,786**	**4.6**
	From model 1	**8,004**	**3,449**	**0.43**	**1,772**	**0.22**	**2,782**	**0.35**	**109,660**	**4.4**
	From model 2	**8,217**	**3,467**	**0.42**	**1,547**	**0.19**	**3,203**	**0.39**	**104,654**	**4.6**
	From model 3	**8,069**	**3,626**	**0.45**	**1,627**	**0.20**	**2,816**	**0.35**	**105,135**	**5.0**
3	**Actual**	**13,016**	**5,767**	**0.44**	**2,414**	**0.19**	**4,835**	**0.37**	**105,261**	**4.5**
	From model 1	**14,091**	**6,256**	**0.44**	**2,613**	**0.19**	**5,222**	**0.37**	**118,297**	**4.9**
	From model 2	**13,688**	**6,118**	**0.45**	**2,570**	**0.19**	**5,000**	**0.37**	**109,768**	**4.8**
	From model 3	**13,429**	**5,750**	**0.43**	**2,440**	**0.18**	**5,238**	**0.39**	**115,413**	**4.2**
4	**Actual**	**20,828**	**9,545**	**0.46**	**3,506**	**0.17**	**7,776**	**0.37**	**152,723**	**5.5**
	Model 1	**21,669**	**9,529**	**0.44**	**3,420**	**0.16**	**8,720**	**0.40**	**147,117**	**5.1**
	Model 2	**21,306**	**9,587**	**0.45**	**3,616**	**0.17**	**8,102**	**0.38**	**140,759**	**5.2**
	Model 3	**21,204**	**9,834**	**0.46**	**3,891**	**0.18**	**7,478**	**0.35**	**146,960**	**4.9**
5	**Actual**	**48,951**	**22,307**	**0.46**	**8,505**	**0.17**	**18,140**	**0.37**	**291,992**	**9.5**
	Model 1	**46,972**	**22,049**	**0.47**	**7,484**	**0.16**	**17,439**	**0.37**	**265,167**	**9.8**
	Model 2	**47,124**	**22,036**	**0.47**	**7,767**	**0.16**	**17,322**	**0.37**	**274,937**	**9.7**
	Model 3	**47,224**	**21,943**	**0.46**	**7,741**	**0.16**	**17,540**	**0.37**	**269,448**	**9.9**

[1] Zonal model; [2] Income component quintile model; [3] per capita income quintile model; [4] from a regression of yes/no responses to the ownership of a set of 15 assets.

How well do the model results perform in multivariate analyses?

The superior performance of the conditional models continues in multivariate analyses. Table 7 shows the results of a regression of household *per capita* income against independent variables which could be considered determinants of those income levels. The regressions with actual data and data from both conditional models show all right hand side variables to be significant and of expected sign; the regression using data from the zonal models shows female-headedness of a household to be insignificant. On most variables, the regression with zonal model data also gives less accurate coefficient estimates. For example, the actual coefficient on log years of education is 0.016; the conditional models each give an estimate of 0.015, while the zonal models give an estimate of 0.024, a difference of more than 50%. The same pattern is seen on household size, wage rates in the household's area, and female-headedness. Overall, the two conditional models clearly perform better in this multivariate analysis than do the zonal models.

Table 7. Determinants of Household *per capita* Income, Actual Values Compared to Model-Generated Values (Linear regression results after controlling for village level effects)

Variable	**Actual Data[1]**		**Proxy Data[2]**					
			Zonal Models		**Component Income Quintile Models**		**Per Capita Income Quintile Models**	
	Coef.	**Sig.**	**Coef.**	**Sig.**	**Coef.**	**Sig.**	**Coef.**	**Sig.**
Constant	8.173	0.000	8.470	0.000	8.667	0.000	8.540	0.000
Log cultivated acres	0.390	0.000	0.370	0.000	0.391	0.000	0.357	0.000
Log years of education, hh head	0.016	0.010	0.024	0.000	0.015	0.007	0.015	0.007
Log hh size	-0.761	0.000	-0.819	0.000	-0.795	0.000	-0.747	0.000
Log ag wage rate (per hour)	0.230	0.035	0.246	0.030	0.231	0.023	0.227	0.027
Log value of non-land assets[3]	0.187	0.000	0.174	0.000	0.145	0.000	0.157	0.000
Female headed hh	-0.194	0.007	-0.058	0.442	-0.173	0.010	-0.154	0.024
R^2	0.460		0.438		0.463		0.447	

[1] Dependent variable = natural log per capita income
[2] Dependent variable = natural log predicted per capita income
[3] Variable in proxy data models is log predicted value of non-land assets. All other variables are the same in the two models.

B. External Performance Evaluation

Table 8 shows a comparison of poverty results from the Tegemeo/MSU data set with those in the 2000 report of the Ministry of Finance and Planning on poverty in Kenya (based on the Welfare Monitoring Surveys - WMS). These results should be interpreted with care for at least two reasons. First, WMS data are household expenditure, while Tegemeo/MSU data are household income. It is generally accepted within the literature that income surveys result in

some degree of underreporting of true income; expenditure is generally thought to be a less sensitive topic and result in more complete reporting. Second, the WMS sample was fully randomized and nationally representative, while Tegemeo/MSU was based on a purposive selection of 24 districts representative of the non-marginal areas of the country.

To create the table, we took the WMS definition of poverty - 1,239 Ksh/month/adult equivalent in 1997 shillings - and adjusted it to 2000 terms based on accumulated inflation of 14% between the two surveys. We then calculated adult equivalents using the WMS definition, and calculated income per adult equivalent from the Tegemeo/MSU data set. These numbers were then used to classify households as lying above or below the poverty line.

The absolute numbers in the table should be treated with caution for the reasons enumerated above. Nevertheless, the data show that the estimates of poverty from the two data sets are extremely close: the WMS 1997 estimate of the headcount ratio is 52.9%, while the Tegemeo/MSU 2000 estimate, using WMS definitions, is 53.0%. These results suggest that, unless poverty has dramatically increased since 1997, the Tegemeo/MSU income approach resulted in very little underreporting of income.

Aside from any possible undercounting, which here appears to be minor, the patterns in the table - the relationship between income or expenditure and demographic variables - should be less sensitive to the choice of variable. The patterns observed in the two data sets are similar with respect to education of the head of household and age group of the head of household. Patterns diverge, however, with respect to female headedness and size of the household. Tegemeo/MSU data show female headed households having lower incomes than male headed households. This is the common pattern in most African data sets, and contrasts with WMS, which found no significant difference. Tegemeo/MSU data show no consistent relationship between household size and incomes, in contrast to the negative relationship found in the WMS data. In this case, the WMS pattern is most common in other African data sets. These and other relationships between the Tegemeo/MSU and WMS data deserve further analytical attention.

C. Conclusions from Model Evaluation

The internal evaluation of model results suggests clearly that the two conditional models are superior to the zonal model, both for overall accuracy and especially for their performance in tabular and multivariate analyses which may be done with the data. Among the two conditional models, the second model - conditional on expected total *per capita* income of the households as predicted from the zonal models - generally outperformed the first conditional model in the analyses presented here, and is therefore the preferred model for future use. There is no significant difference between the models in terms of number of proxy variables and implied data collection burden.

Table 8. Comparison of Relationship Between Headcount Poverty Index and Household Demographic Variables in Welfare Monitoring Survey (WMS) and Tegemeo/MSU Data, Using WMS Definition of Adult Equivalent and Based on Income/AE

Demographic variable	Welfare Monitoring Survey Data	Tegemeo/MSU Data	
		Calculated income/ae	Predicted income/ae
	---------- % poor ----------		
Overall	52.9	54.6	53.0
Sex of hh head			
Male	52.5	52.9	51.4
Female	54.1	64.6	62.6
Education of hh head			
None	64.0	71.6	68.8
Primary	53.6	59.1	58.5
Secondary	33.4	37.4	34.7
Post-secondary	6.8	16.7	14.1
HH size			
1-3 persons	35.5	52.9	50.0
4-6	49.6	45.0	43.1
>6	61.7	57.8	56.4
Age group of hh head			
15-29	37.9	44.8	41.4
30-44	49.1	45.5	42.1
45-55	58.1	55.2	53.9
>55	57.7	60.7	60.1

VI. Using the Models

Using the models developed in this work to generate estimates of income and our eight income components involves first collecting the simplified proxy data, entering it into a specific data structure, and then running the SPSS/Windows syntax file which converts the proxy data into estimates of household incomes and income components. In practice, the

results generated by the syntax file then need to be critically reviewed to be sure they are reasonable, and underlying proxy variables need to be examined for implausible cases.

Annex B contains the model questionnaire that can be used to collect the needed proxy data. During actual proxy data collection in 2002, additional sections were added to this questionnaire at the request of Tegemeo and MSU. This can be done -- modules or sections can be added -- as long as a) nothing is removed from the model questionnaire and b) the basic structure of the model questionnaire is not altered. If any sections are removed, it will not be possible to run all the prediction models accurately. If the structure of the questionnaire is altered, the syntax file which generates results will have to be modified to run properly, and these modifications can become complex if substantial changes are made in the questionnaire.

Annex E provides ste-by-step instructions for entering the proxy data, structuring and saving the files, and running the SPSS syntax file to generate results. ***It is imperative that these procedures be followed closely to avoid substantially increasing the complexity of generating these income proxy results.***

Annex A

Cost Comparison, Proxy Vs. Full Income Survey

Table A1. Indicative Dollar and Time Budget for Full Income Survey of 1,500 Households Compared to Income Proxy Survey of Same Size

Task	Cost		Elapsed Time (weeks)		Assumptions/Comments
	Full	Proxy	Full	Proxy	
Questionnaire Design	**2,302**	**307**	**3**	**0.40**	3 weeks elapsed time for full survey; 2 days for proxy survey (model questionnaire needs only to be reviewed and possibly modified in small ways.
Senior analyst	837	112			1 senior analyst 25% time @ $4,800/month.
Analyst	907	121			1 Analyst 50% time @ $2,600/month.
Research Assistants	558	74			2 Research Assistants 50% @ $800/month.
Data collection	**43,362**	**23,412**	**7**	**7.00**	45 days in the field for full income survey, Same for proxy, but only half as many enumerators. This reduction is based on proxy interview taking only 1/4 as much time, but equal fixed costs of reaching villages and finding households in each village.
Enumerator time					
Per diem	21,600	10,800			16 enumerators full survey, 8 proxy, @ $30/day per diem
Salaries	7,200	3,600			16 enumerators, 8 proxy, @ $300/month salary
Field supervisor time					
Per diem	5,400	2,700			4 field supervisors full survey, 2 proxy @ $30/day per diem
Salaries	4,800	2,400			4 field supervisors full survey, 2 proxy @ $800/month salary
Overall supervisor time (Analyst)					
Per diem	675	675			1 overall supervisor 50% time @ $30/day per diem both surveys
Salaries	1,887	1,887			1 overall supervisor 50% time @ $2,600/month salary both surveys
Gasoline	1,800	1,350			4 vehicles, 45 days, 100 km/day, 8 km/liter, $0.80/liter for full survey; 3 vehicles for proxy survey
Post-coding & data entry	**4,721**	**1,180**	**3**	**0.75**	1 week post-coding, 2 weeks data entry for full survey. 75% less than this for the proxy survey. This figure based on data being approximately 1/4 as much in the proxy survey and no need for post-coding in it.
Field supervisor time	1,488	372			All 4 supervisors for post-coding, only 2 for data entry supervision.
Overall supervisor time (Analyst)	907	227			Overall supervisor works half-time on each activity.
Data entry personnel	2,326	581			10 DE personnel @ $500/month for 2 weeks on full survey

Task	Cost		Elapsed Time (weeks)		Assumptions/Comments
	Full	**Proxy**	**Full**	**Proxy**	
Data cleaning	**10,468**	**2,617**	**6**	**1.50**	4 field supervisors and 1 overall supervisor for six weeks on full survey. 1 Senior Analyst for 2 weeks. 75% less time for proxy survey
Field supervisor time	4,465	1,116			
Overall supervisor time (Analyst)	3,603	901			
Senior Analyst	2,400	600			Salary $4,800/month
Data Analysis	**27,000**	**1,709**	**13**	**1.00**	3 months full survey, 1 week proxy survey
Research Assistants	4,800				2 full time RA's for full. None on proxy
Analyst	7,800	600			1 full time Analyst for full and proxy
Senior Analyst	14,400	1,109			1 full-time Senior Analyst for full and proxy
Total	**87,853**	**29,225**	**32**	**10.65**	Total cost of proxy survey approximately 1/3 full survey. Total elapsed time approximately 20% of full survey.
Analyst costs	**33,416**	**6,231**			

Annex B: Income Proxy Questionnaire for Tampa Models

Egerton University - Tegemeo Institute/MSU
Rural Household Indicators Survey
May, 2002

Identifying Variables:

		NAME (Please write)		**CODE**
Province (Write name, then enter code at far right)		_____	PROV	_____
District (Write name, then enter code at far right)		_____	DIST	_____
Division (Write name, then enter code at far right)		_____	DIV	_____
Location	Sublocation (Write name, then enter code at far right)	_____	SUBLOC	_____
	Village (Write name, then enter code at far right)	_____	VILL	_____
Household Number		_____	HHID	_____
HH Name		_____		
Respondent Name		_____		
Date		_____		
Enumerator (Write name, then enter code at far right)		_____	ENUM	_____
Is this a Replacement Household (1=yes,2=no)			REPLACE	_____

"We are part of a team from Egerton University, who are doing Research that will be used to make recommendations to the Government of Kenya regarding investments and policies that would best support food production, food marketing, and income growth in Kenya's rural areas. Your help in answering these questions is very much appreciated. The survey should take less than an hour. Your participation is completely voluntary. Your responses will be **COMPLETELY CONFIDENTIAL** and will be added to those of 1,400 other households in Kenya and analyzed together. If you have any questions or concerns about this study, you may contact the Director, Tegemeo Institute, Egerton University P.0 Box 20498, 00200. Nairobi"

"You indicate your voluntary agreement to participate by beginning this interview. Do you have any questions?"

HHID_____

AGRICULTURAL ACTIVITIES

Q1. How many **TOTAL ACRES** did you cultivate (include perennial and annual crops) during the most recent **SHORT SEASON**?(Eastern Kenya refers to July-Sept 2001 harvest; Western Kenya Nov-Jan 2002 harvest) **TACRE1** _____

Q2. How many **TOTAL ACRES** did you cultivate (include perennial and annual crops) during the most recent **MAIN SEASON**?(Eastern Kenya refers to Jan-march 2002 harvest;Western Kenya July/October 2001; R.Valley Nov/Dec 2001) **TACRE2** _____

Q3. CEREALS, TUBERS, AND PULSES

Crop		Did you ***plant*** this crop during either main or short harvest? 1=yes 2=no	Did you apply any ***fertilizer*** to this crop during either harvest? 1=yes 2=no	Did this crop sustain any ***damage*** from pests, or weather, or disease, or any other problem? 1=yes 2=no	Did you ***completely lose*** this crop from any field during either harvest? 1=yes 2=no	Did you ***sell*** any of this crop over the past 12 months? 1=yes 2=no
CROP		**PROD**	**FERT**	**DAMAGE**	**LOSE**	**SELL**
Maize	1					
Green maize	2					
Beans	7					
Sorghum	8					
Millet	9					
Wheat	13					
Cowpeas	21					
Irish potatoes	27					
Cassava	28					
Rice	31					
Groundnuts	33					
Greengrams	34					
Sweet potato	43					
Arrowroots	44					
Barley	60					
Yams	81					
Pigeon peas	141					
Caster oil	146					
Njahi	147					
Soyabeans	160					
Bulrush millet	169					

Q4. Considering both the short and main harvests, which of these crops gave you the ***greatest amount of food for home consumption?*** (**WRITE** the crop _____) **FOODCTP** _____

Q5. Again considering both the short and main harvests, what ***quantity*** of this crop (the one listed in the previous question) did you produce over the past year?

Quantity **QNTCTPF** ____

1=90 kg bag 11=50 kg bag 2=kgs 4=crates 5=numbers 12=debe **Unit** **UNITCTPF** _____
9=gorogoro 10=tonnes

Q6. Considering both the short and main harvests, which of these crops gave you the ***greatest cash income*** (from sales)? (**WRITE** the crop or **0** if none_____) **CASHCTP** _____

HHID_____

Q7. Again considering both the short and main harvests, what ***quantity*** of this crop (the one listed in the previous question) did you produce over the past year?

Quantity **QNTCTPC** _____

1=90 kg bag 11=50 kg bag 2=kgs 4=crates 5=numbers
9=gorogoro 10=tonnes 12=debe

Unit **UNITCTPC** _____

Q8. FRUITS AND VEGETABLES

Crop		Did you ***plant*** this crop during either main or short harvest? **1=yes 2=no**	Did you apply any ***fertilizer*** to this crop during either harvest? **1=yes 2=no**	Did this crop sustain any ***damage*** from pests, or weather, or disease, or any other problem? **1=yes 2=no**	Did you ***completely lose*** this crop from any field during either harvest? **1=yes 2=no**	Did you ***sell*** any of this crop over the past 12 months? **1=yes 2=no**	Crop		Did you ***produce*** this crop during either main or short harvest? **1=yes 2=no**	Did you apply any ***fertilizer*** to this crop during either harvest? **1=yes 2=no**	Did this crop sustain any ***damage*** from pests, or weather, or disease, or any other problem? **1=yes 2=no**	Did you ***completely lose*** this crop from any field during either harvest? **1=yes 2=no**	Did you ***sell*** any of this crop over the past 12 months? **1=yes 2=no**
CROP		**PROD**	**FERT**	**DAMAGE**	**LOSE**	**SELL**	**CROP**		**PROD**	**FERT**	**DAMAGE**	**LOSE**	**SELL**
cabbage	93						Watermelon	69					
carrot	94						Avocado	97					
capsicum	67						Banana	10					
indig. vegs	140						Guava	72					
onions	96						Lemons	74					
pumpkin	76						Mango	73					
snow peas	90						Orange	75					
spinach	66						Passion fruit	137					
sukuma wiki	64						Pawpaw	70					
tomatoes	63						Pineapples	133					
brinjals	129						White suppoise	163					
cucumber	125						Apples	119					
French beans	25						Cashew nuts	24					
garlic onion	138						Coconuts	23					
gourds	62						Lugard	118					
green peas	167						Macadamia	135					
pepper	65						Matomoko	120					
squash	124						Miraa	148					
turnips	161						Peaches	166					
Sugarcane (chewing)	170						Pears	134					
Nathi	165						Plums	121					
Mero	95						tree tomato	162					
							wild berries	149					

Q9. Considering both the short and main harvests, which of these crops gave you the ***greatest amount of food for home consumption?*** (**WRITE** the crop _____) **FOODFV** _____

Q10. Again considering both the short and main harvests, what ***quantity*** of this crop (the one listed in the previous question) did you produce over the past year?

HHID_____

Quantity **QNTCTPF** _____

1=90 kg bag 11=50 kg bag 2=kgs 4=crates 5=numbers6=bunches (Bananas) **Unit** **UNITFVF**
9=gorogoro 10=tonnes 12=debe _____

Q11. Considering both the short and main harvests, which of these crops gave you the ***greatest cash income*** (from sales)? (**WRITE** the crop or **0** if none_____) **CASHFV** _____

Q12. Again considering both the short and main harvests, what ***quantity*** of this crop (the one listed in the previous question) did you produce over the past year?

Quantity **QNTFVC** _____

1=90 kg bag 11=50 kg bag 2=kgs 4=crates 5=numbers6=bunches (Bananas) **Unit** **UNITFVC**
9=gorogoro 10=tonnes 12=debe _____

Q13. INDUSTRIAL CROPS

Crop		Did you ***plant/produce*** this crop during either main or short harvest? **1=yes 2=no**	Did you apply any ***fertilizer*** to this crop during either harvest? **1=yes 2=no**	Did this crop sustain any ***damage*** from pests, or weather, or disease, or any other problem? **1=yes 2=no**	Did you ***completely lose*** this crop from any field during either harvest? **1=yes 2=no**	Did you ***sell*** any of this crop over the past 12 months? **1=yes 2=no**
CROP		**PROD**	**FERT**	**DAMAGE**	**LOSE**	**SELL**
Cotton	14					
Fodder	22					
Pyrethrum	17					
Sisal	16					
Sunflower	30					
Tobacco	29					
Coffee	11					
Tea	12					
Sugarcane (industrial)	15					

Q14. Considering both the short and main harvests, which of these crops gave you the ***greatest cash income*** (from sales)? (**WRITE** the crop or **0** if none_____) **CASHIND** _____

Q15. Again considering both the short and main harvests, what ***quantity*** of this crop (the one listed in the previous question) did you produce over the past year?

Quantity **QNTINDC** _____

1=90 kg bag 11=50 kg bag 2=kgs 4=crates 5=numbers **Unit** **UNITINDC**
9=gorogoro 10=tonnes 12=debe _____

Q16. What is your view about the production year?(*the most recent short and main harvests*)? 1=Good
2=Normal **PRODYR**
3=Poor _____

Q17. Considering both the short and main harvests, did you hire any **LABOUR** (casual or permanent) for any cropping activities? (1=yes, 2=no) **HIRELBR** _____

Q18. What is the **daily wage rate** for **general farm labor** in this area? (Ksh per day) **WAGE** _____

HHID_____

Q19. LIVESTOCK (Reference period is over the past 12 months)

Animal		How many of these animals do you currently own?	Did you sell any of this type of animal over the past 12 months? (1=yes, 2=no)
ANIMAL		**NANIM**	**SELLANIM**
Grade cow	1		
Cross cow	2		
Local cow	3		
Grade bull	4		
Cross bull	5		
Local bull	6		
Grade calf	7		
Cross calf	8		
Local calf	9		
Goat	11		
Sheep	10		
Chicken	12		
Duck	13		
Rabbit	16		

Q20. LIVESTOCK PRODUCTS

Livestock Product		Did you produce any of this product over the past 12 months? (1=yes, 2=no)	Did you sell any of this product over the past 12 months? (1=yes, 2=no)
ANIMPROD		**NPROD**	**SELLPROD**
Milk	1		
Eggs	2		
Honey	3		
Hides& skin	5		
Other livestock products	6		

HHID_____

1. <u>Household</u> <u>Members</u>: We'd like to talk to you about all the members you told us about in the last survey in June 2000. (Example) HHID: ___X___

Key variables: PROV, DIST, DIV, LOC, HH, MEM Reference Period: The Last 12 Months

ID	Name (Start with head of household)	Was this person consid-ered as a member of the house-hold in the 2000 survey? 1=Yes 2=No	Age in the year 2000	Age now	Sex 1=M 2=F	Rela-tion to head in 2000	Rela-tion to head in 2000 See code below	Marital Status 1=single 2=mono-gamously married 3=poly-gamously married 4=divorced 5=widowed 6=separated 7=other	How amny months in the past 12 months has this person lived at home	Is this person in school? 1=Yes 2=No	Years of schooling 0=none 1..12 for years completed 20=some University 21=completed University 22=post-graduate	Is this person still a member of this house-hold? 1=Yes go to D13 2=No go to D10	.Did this person engage in any business or informal labor activities during the past 12 months? (incl jua kali , farm kibaruas, farm other districts) 1=yes 2=no	Did this person have any salaried employment during any of the past 12 months? 1=yes 2=no
MEM	**Name**	**D01**		**D02**	**D03**		**D04**	**D05**	**D06**	**D07**	**D08**	**D09**	**D18**	**D19**

Relationship to head (D04)

1=head
2=spouse
3=own son/daughter
4=step son/daughter
5=parent
6=brother/sister
7=nephew/niece
8=son/daughter-in-law
9=grandchild
10=other relative
11=unrelated

Reasons for absent (D10)

1=left to find a job
2=left to attend school
3=married away
4=deceased
5=divorced/separated
6=living with relatives
7=others (specify)

HHID_____

Q22. NEW HOUSEHOLD MEMBERS: IF YOU HAVE NEW MEMBERS SINCE THE LAST SURVEY IN JUNE 2000, PLEASE TELL US ABOUT THOSE NEW MEMBERS.

Key variables: PROV, DIST, DIV, LOC, HH, MEM Reference Period: The Last 12 Months

ID	Name (Start with head of household)	Was this person listed as a member of the household in the 2000 survey? 1=Yes 2=No	Age	Sex 1=M 2=F	Relation to head See code below	Marital Status 1=single 2=mono-gamously married 3=poly-gamously married 4=divorced 5=widowed 6=separated 7=other	Number of months living at home in the last 12 months	Is this person in school? 1=Yes 2=No	Years of schooling 0=none 1..12 for years completed 20=some University/college 21=completed University 22=post-graduate	Is this person still a member of this household? 1=Yes go to D13 2=No go to D10	Did this person engage in any business or informal labor activities during the past 12 months? (incl jua kali , farm kibaruas, farm other districts) 1=yes 2=no	Did this person have any salaried employment during any of the past 12 months? 1=yes 2=no
MEM	**Name**	**D01**	**D02**	**D03**	**D04**	**D05**	**D06**	**D07**	**D08**	**D09**	**D18**	**D19**
51		2										
52		2										
53		2										
54		2										
55		2										
56		2										
57		2										
58		2										
59		2										
60		2										
61		2										

Relationship to head (D04)

1=head
2=spouse
3=own son/daughter
4=step son/daughter
5=parent
6=brother/sister
7=nephew/niece
8=son/daughter-in-law
9=grandchild
10=other relative
11=unrelated

Reasons for absent (D10)

1=left to find a job
2=left to attend school
3=married away
4=deceased
5=divorced/separated
6=living with relatives
7=others (specify)

Q23. OFF-FARM ACTIVITIES

Q.24. ***Participation in off-farm activities over the past 12 months***

Month *Change starting and ending months as appropriate for timing of survey. Last month in list should be last month prior to survey.*		Did anyone in this household earn income from any kind of **business or informal labour** activities during the indicated months? (incl jua kali , farm kibaruas, farm other districts) (1=yes, 2=no)	Did anyone in this household earn income from any kind of **salaried employment or remittance** during any of the indicated months? (1=yes, 2=no)
MONTH		**INFMTH**	**SALMTH**
May **2001**	105		
June	106		
July	107		
Aug	108		
Sep	109		
Oct	110		
Nov	111		
Dec	112		
Jan **2002**	201		
Feb	202		
March	203		
April	204		

HHID_____

Q25. ***Business and informal off-farm activities, and salaried wage labour***

Business and Informal Off-farm Activities			**Salaried Wage Labour**		
Activity		Over the past 12 months, did anyone in your household engage at any time in any of the following **business/informal** off-farm activities? (1=yes, 2=no)	Activity		Over the past 12 months, did anyone in your household engage at any time in any of the following **salaried wage labour** activities? (1=yes, 2=no)
ACTINF		**INFORMAL**	**ACTSAL**		**SALARIED**
Informal/Business Activities			**Salaried Employment/Remittance**		
Farm kibarua	7		Receive remittances	12	
Tout	36		Teacher	15	
Bicycle repair business	2		Driver	4	
Transport business (goods)	38		Manager	19	
Timber trading business	35		Receive pension income	10	
Mining business	24		Police	11	
Jaggery	18		Shopkeeper/attendant	24	
Hawking	17		Watchman	17	
Traditional doctor	37		Clerk	3	
Carpentry business	6		Sales person	13	
Rental properties	29		General farm worker	6	
Driver	12		Banker/receptionist	18	
Local brewing business	20		Lecturer/tutor	21	
Retail shop/kiosk	30		Civil leader	20	
Fish trading business	15		Chief/Assistant chief	2	
Clothes business	9		Industrial worker	8	
Posho mill	28				

Q26. HOUSEHOLD ASSETS

AT PRESENT, how much/many of the following does this household own?

Agricultural asset	Quantity	Agricultural asset	Quantity	Agricultural asset	Quantity
ITEM	**QTY**	**ITEM**	**QTY**	**ITEM**	**QTY**
15=cart		**28=radio**		**40=solar panel**	
18=car		**29=zero-grazing units**		**45=water pump**	
19=truck		**33=bore hole**		**46=telephone**	
21=irrigation equipment		**34=motor cycle**		**50=donkey**	
22=water tank				**51=water trough**	
25=wheel barrow					

Q27. IMPORTANCE OF INCOME SOURCES

Economic Activity		Please indicate the order of importance of each of these activities in the household's total income during the past 12 months -9=activity could not be ranked 0=did not give any income though produced 1=this activity gave the highest income of any activity, 2=this activity gave the second highest income ... ... -1=the household did not engage in this activity ***Enumerator***: **First place a -1 for all activities that the household did not engage in.** Then determine which of the remaining activities was the most important, second, etc.
ECONACT		**ORDER**
Crop production and sales (all crops)	1	
Livestock production and sales	2	
Farm kibarua	3	
Non-farm kibarua	4	
Salaried labor	5	
Business activities	6	
Remittance	7	

Annex C: Enumerator Manual for Proxy Survey

Enumerator Manual – Income Proxy Section
Kenya Rural Household Indicators Survey
May, 2002

Identifying Variables

A household number is to be assigned by the supervisor.

Date refers to the date the interview is carried out and should be recorded in this format; ddmmyy

Replacement

Replacement means that the household is totally new and was never interviewed in 1997 or 1998 or 2000. However efforts should be made to locate the original household and replacement should only be done when one reaches a dead end.

Note that a replacement will have a different household identification number.

Replacement will be done only when more than 10 % of the original households in the cluster (village) cannot be interviewed else only the original household should participate. Replacement should be based on the rule of thumb. The agreed approach is to get out of the original household, go to the right without crossing the road, count three households - the forth one becomes a replacement of the original household. If unsuccessful in the fourth household the next household will be interviewed.

A qualified respondent is an adult member of the household preferably over 18 years old who is knowledgeable about household activities including crops and livestock.
A respondent may consult any other member of the household on different items of the questionnaire.

Definition of main and short seasons

Seasons	**Eastern**	**Western**	**R/ valley**
Main	Jan-Mar00, plant Oct	July-Aug99, plant Apr Apr	Nov-Dec99, plant
Short	July-Sep99, plant Apr	Dec-Jan00, plant Oct	Vegetables, plant Oct

Paces converted into acres (X*Y)/4800.

Other conversions
" 8 gogogoros of maize = 1 Debe
" 40 Gorogoro of maize = 1 90-kg bag

AGRICULTURAL ACTIVITIES

Q1/Q2. The focus is on land **used**. Be sure to include the area under both annual and perennial crops in the estimate of total area. Also include land the household rented in or used under sharecropping arrangements. Do NOT include land that the household owns but did not use due to renting or loaning out

Q3. These questions all require simple yes/no answers. The table applies only to cereals, pulses, and tubers.

- PROD: Answer "yes" if the crop was planted, even if no production was realized. If a crop was not planted during either season, skip down to the next crop in the list.

- FERT: Answer "yes" if any amount of fertilizer was applied to the crop during either short or long seasons.

Q4. This question refers to the crops listed in the Table Q3. First determine which of these crops gave the greatest quantity of food for home consumption. Write the name of the crop in the space provided, then use the codes from Q3 to enter the code on the far-right side.

Q5. Determine the quantity of the crop that was identified in question Q4. Indicate the number of units in QNTCTPF and the type of unit in UNITCTPF. For example, six 50 kg bags would be coded QNTCTPR=6, and UNITCTPF=11.

Q6. This question also refers to the crops listed in Table Q3, but now focuses on which of these gave the greatest quantity for sale, not for home consumption. Fill out Q6 and Q7 with the same procedure used in Q4 and Q5.

Q8. The structure of this table is identical to Table Q3, but it applies to fruits and vegetables. Vegetables are on the left, and fruits on the right.

- PROD: Since fruits are perennials, the question for these crops changes slightly. We want to know if they actually produced the fruit, not if they planted it. So, if they have, for example, an apple tree but produced no fruit from it, answer "no" to PROD for that fruit.

Q9-Q12. These questions are structured in an identical fashion to questions Q4-Q7, but they apply to fruits and vegetables, not to cereals, pulses and tubers.

Q13. This table is identical to Q3, but applies to "industrial" crops rather than to cereals, pulses and tubers.

- PROD: For perennial crops in this list, such as coffee and tea, reply "yes" only if the household ***produced*** the crop. If they had trees but did not produce, answer "no". For annual crops such as cotton, answer "yes" as long as they planted, even if they achieved no harvest.

Q14/Q15. These questions focus only on cash income, since these crops are almost entirely sold. They are structured identically to the equivalent questions for cereals/pulses/ tubers (Q6/Q7) and fruits/vegetables (Q11/Q12).

Q16. Ask the respondent to make an overall assessment of the production year, considering both short and main harvests.

Q17. Casual or permanent labor: Be sure to answer "yes" even if only small amounts of labor were hired.

LIVESTOCK

Q19. Livestock: We want the number of animals they currently own of each type.

Q20. Livestock products: be sure to record an answer of "yes" for NPROD even if only small amounts were produced and even if they were all used for home consumption.

DEMOGRAPHICS

Q21. This table asks about individual information of individuals who are listed in the 2000 survey, while Table Q22 asks about new household members.*

In Q21, the ID number, name, Age, Sex, and Relationship to head of all members from 2000 will be already printed in the table. Please use this information to identify individuals. Please ask questions about ***all*** listed individuals even if some of them do not live with the respondents anymore.

NAME: Please ask if the printed name of this person is correct. If not, please correct the names on the questionnaire. Ask the name of this person if he or she is a new member.

D01: This will have the value 1 already printed, sine all members in this table are from the 2000 survey.

D02: This column asks for current age. It is preceded by a column with no variable name which has printed the age recorded in 2000. Please use the printed age for crosschecking, then update the current age.

D03: Please ask if the printed gender of this person is correct. If not, please cross out the printed gender information, and put the correct information on the questionnaire. Please ask the gender of this person if he or she is a new member.

D04: This question asks the person's relationship with the household head. It is preceded by a column with no variable name which lists the relationship recorded in 2000. Use this printed information for

crosschecking. Note that the codes in this survey are more detailed. Codes are printed at the bottom of the table.

D05: Ask marital status of this individual. There are seven codes, and the codes are in the table. Unmarried children, such as babies, are singles. A wife whose husband has more than one wives is defined as polygamously married even though she has only one husband.

D06: Ask how many months out of the past 12 months this person spent with the household.

D07: Ask if this person is currently in school.

D08: Ask the highest grade completed by this person. Put zero for no schooling. Put 1 for the first grade, 2 for the second grade, and so on. Put 20 if this person has any university education but has not finished. Put 21 if this person has completed a university degree. Put 22 for any post university education.

If this person is currently in school, put the highest completed degree. For instance, if he or she is currently in the third grade, put 2 (the second grade) in D08.

D09: Ask if this person is still a member of this household. If he/she is still a member, skip to D13. If not, go to the next question (D10).

D10: If this person is **no longer** a member of this household (D09=2), ask for the reason. There are seven codes, printed at the bottom of the table.

If the answer is (4) deceased, go to the next question (D11). If the answer is not (4), skip to D18.

D11: If this person has passed away (D10=4), ask the cause of his or her death. There are four codes in the table. If it is (4) other, be sure to specify the cause in the questionnaire.

D12: If this person has passed away (D10=4), ask in which year the person passed away. Please put the year in **four digits**, such as 2000. **Please do not put two digits**, such as 99. Skip the next question and go to D14.

D13: You will ask this person only if the person is still a member of this household (D09=1). Ask if he/she has been ill for at least the past month (continuously). (We are interested in finding individuals who have been chronically ill, which will be determined by the next four questions.)

D14-17: If this person has passed away (D10=4) or has been ill (D13=1), please ask the following four questions about the death or illness. Put either 1 or 2, do not leave these question blank. These questions should only be

left blank if this person passed way but not due to disease D10=4 but D11 is not equal to 1), or if the person has not been sick (D13=2).

D18: Indicate if the person was involved in any business or informal labour activities during the preceding 12 months. Be sure to record "yes" even if the involvement was short term (e.g., during only 1 or 2 months).

D19: Ask if the person was involved in any salaried employment during any of the past 12 months.

Q22. New Members. The structure of this table is identical to Q21, except it has no data from 2000 because it is meant ONLY for NEW MEMBERS. Note that D01 is already filled with a value of 2, to indicate new member.

A new household member is a person who joined the household after the 2000 survey. A new member may have (a) married one of the household members, (b) moved away prior to the 2000 survey but came back, (c) been adopted permanently or being fostered temporarily, or (d) been simply missed in the 2000 survey.

Note: A new member who joined the household since the 2000 survey (June 2000) but has passed away or moved away prior to your visit **SHOULD STILL BE INCLUDED** in this table.

OFF-FARM ACTIVITIES

Q24. Questions D18 and D19 from the two demography tables provide a partial guide for Q24: if anyone replied "yes" to D18 or D19 in either of the Demography tables, then Q24 should be completed. Q18 corresponds to INFMTH, and Q19 corresponds to SALMTH.

We wish to get a sense of the seasonality of the off-farm activities and how continuous they are. Be sure to record "yes" if ANYONE in the household earned ANY MONEY OR IN-KIND INCOME from these activities during the indicated month.

Q25. Indicate "yes" for the indicated activity if anyone was involved in that activity at any point during the past 12 months. Note that the list of activities in Q25 is not exhaustive. Thus, it is possible that a household had off-farm income, thus positive answers to Q18 or Q19 in the demography tables, and some positive answers to INFMTH or SALMTH in Q24, and they could still have all answers of "no" in Q25.

Q26 Household Assets: This table is also not exhaustive. Just indicate the quantity of each listed asset that the household has.

Q27. Please rank the importance of the listed income sources to the household's total **CASH** income.

- First indicate with a -1 those activities that the household did not engage in.
- Then indicate with a 0 (zero) those activities that the household engaged in but which gave no cash income.
- Then rank the remaining activities with 1 (most important), 2 (second most important), etc.
- If, for some reason, an activity cannot be ranked, use -9. Be sure **NOT** to use -9 when -1 or 0 are appropriate.

Annex D: Full Model Results

ZONAL MODELS

A. Retained Cereals and Tubers, Zonal Models

Zone 1

Model

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.974(a)	.948	.943	9157.07137	

a Predictors: (Constant), PPEARET, NCTP number of ctp produced, PVASST02 Unstandardized Predicted Value, QKEYRBE qkeyret interacted with beans, QKEYRCOW qkeyret interacted with cowpeas, QKEYRGRM qkeyret interacted with green maize, QKEYRCA qkeyret interacted with cassava, QKEYRIP qkeyret interacted with irishpotatoes, QKEYRET quant of prodn of key retained crop based on quantity retained approach, STPOTRET, NSOLD number of ctp sold, QKEYRPIP qkeyret interacted with pigeon peas, TACRES total acres cultivated, COWPRET, BNSRET, LBRAREA hlbryes interacted w/ tacres, NDAMAGE number of ctp damaged, DMGQRET ndamage interacted w/ qkeyret, NSLDQRET nsold interacted w/ qkeyret, LBRQRET hlbryes interacted w/ qkeyret, NCTPQRET nctp interacted w/ qkeyret

b Dependent Variable: VRETNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-3379.206	2089.807		-1.617	.107
NCTP number of ctp produced	1832.629	276.175	.219	6.636	.000
NCTPQRET nctp interacted w/ qkeyret	-1.972	.328	-.979	-6.020	.000
NSLDQRET nsold interacted w/ qkeyret	-1.737	.390	-.306	-4.449	.000
NSOLD number of ctp sold	1304.028	464.302	.072	2.809	.005
PVASST02 Unstandardized Predicted Value	-.018	.003	-.101	-5.534	.000
TACRES total acres cultivated	678.995	114.868	.164	5.911	.000
DMGQRET ndamage interacted w/ qkeyret	1.563	.271	.500	5.757	.000
NDAMAGE number of ctp damaged	-1304.166	245.489	-.166	-5.313	.000
LBRQRET hlbryes interacted w/ qkeyret	3.888	1.732	.205	2.245	.026
LBRAREA hlbryes interacted w/ tacres	-629.611	168.696	-.122	-3.732	.000
QKEYRET quant of prodn of key retained crop based on quantity retained approach	26.798	2.195	1.401	12.206	.000
QKEYRGRM qkeyret interacted with green maize	-9.793	3.696	-.044	-2.649	.009
QKEYRBE qkeyret interacted with beans	-18.705	3.906	-.107	-4.789	.000
BNSRET	6280.172	3404.531	.039	1.845	.067
QKEYRCOW qkeyret interacted with cowpeas	6.715	1.835	.084	3.658	.000
COWPRET	-9024.582	3202.283	-.057	-2.818	.005
QKEYRIP qkeyret interacted with irishpotatoes	-9.795	6.730	-.024	-1.455	.147
QKEYRCA qkeyret interacted with cassava	-8.273	1.881	-.078	-4.398	.000
STPOTRET	-5258.812	1867.295	-.050	-2.816	.005
QKEYRPIP qkeyret interacted with pigeon peas	10.021	1.087	.215	9.217	.000
PPEARET	-9703.459	3092.518	-.057	-3.138	.002

a Dependent Variable: VRETNET

Retained Cereals and Tubers, Zonal Models

Zone 2

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.846(a)	.715	.701	6010.46414	

a Predictors: (Constant), STPOTRET, FEMHEAD female headed hh, LBRAREA hlbryes interacted w/ tacres, COWPRET, PRODYEAR Farmer's view about production year 1999/2000, NCTP number of ctp produced, PVASST02 Unstandardized Predicted Value, ORDCOMP order interacted with ecompare, DMGQRET ndamage interacted w/ qkeyret, FERTQRET fertyes interacted w/ qkeyret, QKEYRSTP qkeyret interacted with sweetpotatoes, NSLDQRET nsold interacted w/ qkeyret, FERTAREA fertyes interacted w/ tacres, LBRQRET hlbryes interacted w/ qkeyret, NCTPQRET nctp interacted w/ qkeyret, QKEYRET quant of prodn of key retained crop based on quantity retained approach

b Dependent Variable: VRETNET

	B	Std. Error	Beta	t	sig
(Constant)	-189.632	1591.805		-.119	.905
NCTP number of ctp produced	165.851	138.819	.049	1.195	.233
NCTPQRET nctp interacted w/ qkeyret	1.472	.180	.889	8.157	.000
NSLDQRET nsold interacted w/ qkeyret	-.746	.153	-.317	-4.872	.000
ORDCOMP order interacted with ecompare	126.530	95.087	.045	1.331	.184
PVASST02 Unstandardized Predicted Value	-.006	.004	-.049	-1.457	.146
FEMHEAD female headed hh	-3555.994	847.162	-.128	-4.198	.000
DMGQRET ndamage interacted w/ qkeyret	-.833	.137	-.303	-6.063	.000
PRODYEAR Farmer's view about production year 1999/2000	1164.760	396.988	.091	2.934	.004
FERTQRET fertyes interacted w/ qkeyret	-5.729	1.094	-.480	-5.237	.000
FERTAREA fertyes interacted w/ tacres	716.102	179.316	.271	3.994	.000
LBRQRET hlbryes interacted w/ qkeyret	-2.467	.882	-.194	-2.796	.005
LBRAREA hlbryes interacted w/ tacres	-438.402	166.928	-.169	-2.626	.009
QKEYRET quant of prodn of key retained crop based on quantity retained approach	9.146	1.501	.755	6.093	.000
COWPRET	2530.763	2225.443	.035	1.137	.256
QKEYRSTP qkeyret interacted with sweetpotatoes	2.821	1.322	.090	2.133	.034
STPOTRET	-3121.425	1162.950	-.113	-2.684	.008

a Dependent Variable: VRETNET

Retained Cereals and Tubers, Zonal Models

Zone 3

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.788(a)	.622	.607	9910.41311	

a Predictors: (Constant), STPOTRET, PRODYEAR Farmer's view about production year 1999/2000, SCH_HEAD years of schooling for hh head, DMGQRET ndamage interacted w/ qkeyret, NCTP number of ctp produced, HHSIZE hh size, ORDCOMP order interacted with ecompare, NDAMAGE number of ctp damaged, LBRQRET hlbryes interacted w/ qkeyret, NSOLD number of ctp sold, QKEYRSTP qkeyret interacted with sweetpotatoes, NSLDQRET nsold interacted w/ qkeyret, QKEYRET quant of prodn of key retained crop based on quantity retained approach, NCTPQRET nctp interacted w/ qkeyret

b Dependent Variable: VRETNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-1481.256	2528.826		-.586	.558
NCTP number of ctp produced	873.584	385.274	.110	2.267	.024
NCTPQRET nctp interacted w/ qkeyret	.170	.089	.285	1.920	.056
NSLDQRET nsold interacted w/ qkeyret	-.304	.103	-.339	-2.949	.003
NSOLD number of ctp sold	1274.803	418.358	.147	3.047	.002
ORDCOMP order interacted with ecompare	465.629	133.971	.127	3.476	.001
HHSIZE hh size	442.571	163.602	.090	2.705	.007
SCH_HEAD years of schooling for hh head	-284.154	112.238	-.084	-2.532	.012
DMGQRET ndamage interacted w/ qkeyret	.176	.056	.150	3.136	.002
NDAMAGE number of ctp damaged	-1529.121	312.577	-.198	-4.892	.000
PRODYEAR Farmer's view about production year 1999/2000	3.554	1.550	.075	2.293	.022
LBRQRET hlbryes interacted w/ qkeyret	-2.488	.288	-.681	-8.631	.000
QKEYRET quant of prodn of key retained crop based on quantity retained approach	3.899	.491	1.084	7.943	.000
QKEYRSTP qkeyret interacted with sweetpotatoes	9.643	3.232	.130	2.983	.003
STPOTRET	-7731.352	3061.825	-.111	-2.525	.012

a Dependent Variable: VRETNET

Retained Cereals and Tubers, Zonal Models

Zone 4

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.903(a)	.816	.809	8317.23176	

a Predictors: (Constant), QKEYRSTP qkeyret interacted with sweetpotatoes, NCTP number of ctp produced, SCH_HEAD years of schooling for hh head, IRPOTRET, ORDCOMP order interacted with ecompare, FEMHEAD female headed hh, NDAMAGE number of ctp damaged, DMGQRET ndamage interacted w/ qkeyret, QKEYRIP qkeyret interacted with irishpotatoes, ZEROQRET nzerohrv interacted w/ qkeyret, NSLDQRET nsold interacted w/ qkeyret, NCTPQRET nctp interacted w/ qkeyret, QKEYRET quant of prodn of key retained crop based on quantity retained approach

b Dependent Variable: VRETNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-1265.125	1877.693		-.674	.501
NCTP number of ctp produced	926.082	169.384	.144	5.467	.000
NCTPQRET nctp interacted w/ qkeyret	.262	.102	.341	2.572	.010
NSLDQRET nsold interacted w/ qkeyret	-.888	.138	-.607	-6.417	.000
ORDCOMP order interacted with ecompare	205.426	109.241	.042	1.880	.061
SCH_HEAD years of schooling for hh head	-47.960	102.868	-.011	-.466	.641
FEMHEAD female headed hh	-2610.379	1208.330	-.049	-2.160	.031
DMGQRET ndamage interacted w/ qkeyret	.787	.112	.396	7.003	.000
NDAMAGE number of ctp damaged	-550.916	194.506	-.077	-2.832	.005
ZEROQRET nzerohrv interacted w/ qkeyret	-1.325	.193	-.347	-6.853	.000
QKEYRET quant of prodn of key retained crop based on quantity retained approach	9.707	.978	1.413	9.923	.000
QKEYRIP qkeyret interacted with irishpotatoes	-9.178	.721	-.741	-12.728	.000
IRPOTRET	3637.686	1157.375	.088	3.143	.002
QKEYRSTP qkeyret interacted with sweetpotatoes	-.798	.613	-.096	-1.301	.194

a Dependent Variable: VRETNET

B. Sold Cereals and Tubers, Zonal Models

Zone 1

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.980(a)	.961	.955	5171.44035	

a Predictors: (Constant), ARROWSLD, LBRAREA hlbryes interacted w/ tacres, NCTP number of ctp produced, CASSSLD, FERTAREA fertyes interacted w/ tacres, NSOLD number of ctp sold, QKEYSCA qkeysold interacted with cassava, QKEYSOLD quant of prodn of key sales crop based on value sold approach, NDAMAGE number of ctp damaged, QKEYSARR qkeysold interacted with arrow roots, DMGQSLD, NSLDQSLD, NCTPQSLD

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	2204.811	2047.101		1.077	.284
NCTP number of ctp produced	423.088	232.614	.071	1.819	.072
NCTPQSLD	-1.382	.262	-1.225	-5.277	.000
NSLDQSLD	2.036	.237	.905	8.581	.000
NSOLD number of ctp sold	1224.059	340.552	.117	3.594	.001
DMGQSLD	1.229	.283	.671	4.345	.000
NDAMAGE number of ctp damaged	-849.570	194.028	-.165	-4.379	.000
FERTAREA fertyes interacted w/ tacres	363.418	131.988	.064	2.753	.007
LBRAREA hlbryes interacted w/ tacres	439.595	106.115	.127	4.143	.000
QKEYSOLD quant of prodn of key sales crop based on value sold approach	1.621	1.086	.151	1.492	.139
QKEYSCA qkeysold interacted with cassava	6.375	1.570	.321	4.062	.000
CASSSLD	-7119.331	1920.778	-.106	-3.706	.000
QKEYSARR qkeysold interacted with arrow roots	9.316	5.065	.064	1.839	.069
ARROWSLD	-6379.386	3609.917	-.061	-1.767	0.08

a Dependent Variable: VSOLDNET

Sold Cereals and Tubers, Zonal Models

Zone 2

Model Summary(b)

Model

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.907(a)	.822	.811	4922.73999	

a Predictors: (Constant), QKEYSSOY qkeysold interacted with soybeans, QKEYSMI qkeysold interacted with millet, QKEYSBE qkeysold interacted with beans, QKEYSCA qkeysold interacted with cassava, QKEYSGNT qkeysold interacted with groundnuts, QKEYSRI qkeysold interacted with rice, PRODYEAR Farmer's view about production year 1999/2000, NSLDQSLD, FEMHEAD female headed hh, ZEROQSLD, NSOLD number of ctp sold, LBRQSLD, NCTPQSLD

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-1571.008	955.457		-1.644	.102
NCTPQSLD	.223	.080	.164	2.787	.006
NSLDQSLD	1.016	.145	.465	7.014	.000
NSOLD number of ctp sold	541.481	194.432	.098	2.785	.006
FEMHEAD female headed hh	-1575.953	903.286	-.054	-1.745	.083
ZEROQSLD	-.531	.155	-.108	-3.420	.001
PRODYEAR Farmer's view about production year 1999/2000	738.015	402.520	.055	1.833	.068
LBRQSLD	1.450	.523	.129	2.773	.006
QKEYSBE qkeysold interacted with beans	13.900	1.849	.225	7.516	.000
QKEYSMI qkeysold interacted with millet	17.101	2.337	.217	7.317	.000
QKEYSCA qkeysold interacted with cassava	-3.818	1.131	-.117	-3.374	.001
QKEYSRI qkeysold interacted with rice	8.150	.782	.377	10.416	.000
QKEYSGNT qkeysold interacted with groundnuts	18.574	4.612	.118	4.027	.000
QKEYSSOY qkeysold interacted with soybeans	40.540	15.638	.076	2.592	.010

a Dependent Variable: VSOLDNET

Sold Cereals and Tubers, Zonal Models

Zone 3

Model Summary(b)

Model

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.955(a)	.911	.908	20105.35349	

a Predictors: (Constant), BARSLD, QKEYSWH qkeysold interacted with wheat, ORDCOMP order interacted with ecompare, NDAMAGE number of ctp damaged, NCTPQSLD, DMGQSLD, QKEYSBAR qkeysold interacted with barley, FERTQSLD, NSLDQSLD, QKEYSOLD quant of prodn of key sales crop based on value sold approach

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-7564.314	3970.065		-1.905	.058
NCTPQSLD	-.479	.140	-.223	-3.434	.001
NSLDQSLD	2.232	.169	.703	13.222	.000
ORDCOMP order interacted with ecompare	477.085	307.919	.030	1.549	.122
DMGQSLD	-.260	.135	-.063	-1.928	.055
NDAMAGE number of ctp damaged	960.086	716.152	.030	1.341	.181
FERTQSLD	-2.567	1.101	-.205	-2.332	.020
QKEYSOLD quant of prodn of key sales crop based on value sold approach	7.258	1.314	.575	5.523	.000
QKEYSWH qkeysold interacted with wheat	6.362	.623	.265	10.208	.000
QKEYSBAR qkeysold interacted with barley	-9.451	3.760	-.110	-2.514	.012
BARSLD	70527.558	28633.438	.107	2.463	.014

a Dependent Variable: VSOLDNET

Sold Cereals and Tubers, Zonal Models

Zone 4

Model

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.960(a)	.921	.915	7049.62596	

a Predictors: (Constant), QKEYSSTP qkeysold interacted with sweetpotatoes, NCTPQSLD, QKEYSGNT qkeysold interacted with groundnuts, FERTYES Used fertilizer, NZEROHRV # of crops w/ failed harvest, NADULT # of adults in hh, BNSSLD, QKEYSGRM qkeysold interacted with green maize, PRODYEAR Farmer's view about production year 1999/2000, TACRES total acres cultivated, NSOLD number of ctp sold, IRPOTSLD, ZEROQSLD, LBRQSLD, NSLDQSLD, QKEYSOLD quant of prodn of key sales crop based on value sold approach, FERTAREA fertyes interacted w/ tacres

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	4872.503	4987.387		.977	.330
NCTPQSLD	-.211	.076	-.219	-2.774	.006
NSLDQSLD	.359	.115	.206	3.123	.002
NSOLD number of ctp sold	1442.697	287.768	.119	5.013	.000
NADULT # of adults in hh	-115.505	174.816	-.014	-.661	.510
TACRES total acres cultivated	-2484.852	1444.192	-.469	-1.721	.087
PRODYEAR Farmer's view about production year 1999/2000	1318.536	752.125	.036	1.753	.081
ZEROQSLD	-.661	.228	-.079	-2.897	.004
NZEROHRV # of crops w/ failed harvest	500.609	296.141	.044	1.690	.092
FERTAREA fertyes interacted w/ tacres	2804.655	1447.441	.535	1.938	.054
FERTYES Used fertilizer	-12198.726	4669.168	-.093	-2.613	.010
LBRQSLD	-1.233	.387	-.114	-3.184	.002
QKEYSOLD quant of prodn of key sales crop based on value sold approach	9.920	.808	1.022	12.270	.000
QKEYSGRM qkeysold interacted with green maize	5.459	1.037	.111	5.267	.000
BNSSLD	3806.091	1485.285	.052	2.563	.011
IRPOTSLD	-3722.789	1255.410	-.070	-2.965	.003
QKEYSGNT qkeysold interacted with groundnuts	52.678	7.828	.136	6.729	.000
QKEYSSTP qkeysold interacted with sweetpotatoes	-4.398	1.596	-.058	-2.756	.006

a Dependent Variable: VSOLDNET

C. Retained Fruit & Vegetable, Zonal Models

Zone 1

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.796(a)	.634	.611	11351.67700	

a Predictors: (Constant), QKEYRCP qkeyret interacted w/ cowplvs, QKEYRTO qkeyret interacted w/ tomato, QKEYRGV qkeyret interacted w/ guava, QKEYRCB qkeyret interacted w/ cabbage, QKEYROR qkeyret interacted w/ orange, QKEYRSC qkeyret interacted w/ chewcane, NZEROHRV, QKEYRET quant of prodn of key retained crop based on quantity retained approach, ORDCOMP order interacted with ecompare, NFV number of f&v produced, LBRAREA, LBRQRET hlbryes interacted w/ qkeyret, CBBGRET, NSLDQRET nsold interacted w/ qkeyret

b Dependent Variable: VRETNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-9275.619	2631.670		-3.525	.001
NFV number of f&v produced	1389.510	192.928	.348	7.202	.000
NSLDQRET nsold interacted w/ qkeyret	.053	.033	.154	1.640	.102
ORDCOMP order interacted with ecompare	300.560	206.179	.064	1.458	.146
NZEROHRV	212.514	149.495	.060	1.422	.157
LBRQRET hlbryes interacted w/ qkeyret	-1.638	.326	-.289	-5.028	.000
LBRAREA	925.403	379.214	.134	2.440	.015
QKEYRET quant of prodn of key retained crop based on quantity retained approach	1.346	.336	.407	4.002	.000
QKEYRTO qkeyret interacted w/ tomato	2.605	.803	.150	3.243	.001
QKEYRSC qkeyret interacted w/ chewcane	1.952	1.425	.057	1.370	.172
QKEYRCB qkeyret interacted w/ cabbage	6.763	3.619	.122	1.869	.063
CBBGRET	-13530.929	7524.846	-.119	-1.798	.074
QKEYRGV qkeyret interacted w/ guava	6.945	1.870	.154	3.713	.000
QKEYROR qkeyret interacted w/ orange	6.298	1.623	.168	3.881	.000
QKEYRCP qkeyret interacted w/ cowplvs	12.356	6.725	.076	1.837	.068

a Dependent Variable: VRETNET

Retained Fruit & Vegetable, Zonal Models

Zone 2

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.781(a)	.610	.586	5928.82479	

a Predictors: (Constant), QKEYRIV qkeyret interacted w/ indigveg, NSOLD number of f&v sold, QKEYROR qkeyret interacted w/ orange, QKEYRGV qkeyret interacted w/ guava, QKEYRPP qkeyret interacted w/ pawpaw, QKEYRMG qkeyret interacted w/ mango, PUMPRET, QKEYRON qkeyret interacted w/ onions, QKEYRSU qkeyret interacted w/ sukuma, QKEYRCP qkeyret interacted w/ cowplvs, NDAMAGE number of f&v damaged, QKEYRTO qkeyret interacted w/ tomato, ORDCOMP order interacted with ecompare, QKEYRAV qkeyret interacted w/ avocado, QKEYRCB qkeyret interacted w/ cabbage, NFV number of f&v produced, FERTQRET fertyes interacted w/ qkeyret, QKEYRET quant of prodn of key retained crop based on quantity retained approach

b Dependent Variable: VRETNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-1522.903	1224.147		-1.244	.214
NFV number of f&v produced	1166.014	193.124	.331	6.038	.000
NSOLD number of f&v sold	-867.899	219.675	-.214	-3.951	.000
ORDCOMP order interacted with ecompare	115.536	91.478	.048	1.263	.208
NDAMAGE number of f&v damaged	-438.655	175.459	-.097	-2.500	.013
FERTQRET fertyes interacted w/ qkeyret	-3.973	1.390	-.273	-2.858	.005
QKEYRET quant of prodn of key retained crop based on quantity retained approach	20.303	1.492	3.199	13.610	.000
QKEYRTO qkeyret interacted w/ tomato	-13.588	1.225	-.583	-11.089	.000
QKEYRSU qkeyret interacted w/ sukuma	-14.588	1.581	-.398	-9.225	.000
PUMPRET	-2571.515	1713.786	-.056	-1.500	.135
QKEYRMG qkeyret interacted w/ mango	-19.540	1.494	-2.890	-13.078	.000
QKEYRAV qkeyret interacted w/ avocado	-11.660	2.406	-.195	-4.847	.000
QKEYRCB qkeyret interacted w/ cabbage	-10.510	2.116	-.202	-4.966	.000
QKEYRPP qkeyret interacted w/ pawpaw	-15.312	2.198	-.318	-6.967	.000
QKEYRGV qkeyret interacted w/ guava	-16.849	2.330	-.292	-7.230	.000
QKEYROR qkeyret interacted w/ orange	-16.790	2.369	-.309	-7.087	.000
QKEYRCP qkeyret interacted w/ cowplvs	-22.657	7.586	-.112	-2.987	.003
QKEYRON qkeyret interacted w/ onions	-16.189	2.198	-.295	-7.366	.000
QKEYRIV qkeyret interacted w/ indigveg	-17.776	4.085	-.171	-4.352	.000

a Dependent Variable: VRETNET

Retained Fruit & Vegetable, Zonal Models

Zone 3

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.826(a)	.683	.664	5043.12342	

a Predictors: (Constant), QKEYRIV qkeyret interacted w/ indigveg, QKEYRET quant of prodn of key retained crop based on quantity retained approach, QKEYRPP qkeyret interacted w/ pawpaw, QKEYRCP qkeyret interacted w/ cowplvs, QKEYRGV qkeyret interacted w/ guava, QKEYRAV qkeyret interacted w/ avocado, FEMHEAD female headed hh, QKEYROR qkeyret interacted w/ orange, NZEROHRV, QKEYRPU qkeyret interacted w/ pumpkin, QKEYRSU qkeyret interacted w/ sukuma, HLBRYES used hired labour, QKEYRCB qkeyret interacted w/ cabbage, NFV number of f&v produced, NDAMAGE number of f&v damaged, LBRAREA, ZEROQRET nzerohrv interacted w/ qkeyret, LBRQRET hlbryes interacted w/ qkeyret, DMGQRET ndamage interacted w/ qkeyret, FERTQRET fertyes interacted w/ qkeyret, QKEYRTO qkeyret interacted w/ tomato

b Dependent Variable: VRETNET

Coefficients(a)

Model

	B	Std. Error	Beta	t	sig
(Constant)	-1106.142	598.398		-1.849	.065
NFV number of f&v produced	363.153	92.173	.136	3.940	.000
FEMHEAD female headed hh	1674.734	829.146	.062	2.020	.044
DMGQRET ndamage interacted w/ qkeyret	.663	.103	.442	6.461	.000
NDAMAGE number of f&v damaged	-333.174	133.877	-.102	-2.489	.013
ZEROQRET nzerohrv interacted w/ qkeyret	-1.148	.171	-.307	-6.724	.000
NZEROHRV	489.666	119.958	.178	4.082	.000
FERTQRET fertyes interacted w/ qkeyret	-3.829	.526	-.693	-7.287	.000
LBRQRET hlbryes interacted w/ qkeyret	-6.557	1.005	-.503	-6.524	.000
LBRAREA	-230.979	106.527	-.096	-2.168	.031
HLBRYES used hired labour	10203.744	1945.584	.280	5.245	.000
QKEYRET quant of prodn of key retained crop based on quantity retained approach	17.950	1.044	3.347	17.201	.000
QKEYRTO qkeyret interacted w/ tomato	-14.629	1.025	-2.288	-14.275	.000
QKEYRSU qkeyret interacted w/ sukuma	-12.954	1.099	-.718	-11.786	.000
QKEYRPU qkeyret interacted w/ pumpkin	-2.545	1.058	-.120	-2.405	.017
QKEYRAV qkeyret interacted w/ avocado	-9.042	2.025	-.150	-4.464	.000
QKEYRCB qkeyret interacted w/ cabbage	-13.267	.983	-.979	-13.496	.000
QKEYRPP qkeyret interacted w/ pawpaw	-14.227	6.176	-.070	-2.304	.022
QKEYRGV qkeyret interacted w/ guava	-7.058	2.544	-.089	-2.774	.006
QKEYROR qkeyret interacted w/ orange	-8.671	1.579	-.179	-5.490	.000
QKEYRCP qkeyret interacted w/ cowplvs	-16.417	6.195	-.080	-2.650	.008
QKEYRIV qkeyret interacted w/ indigveg	-13.639	3.860	-.109	-3.534	.000

a Dependent Variable: VRETNET

Retained Fruit & Vegetable, Zonal Models

Zone 4

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.682(a)	.466	.438	7923.85201	

a Predictors: (Constant), QKEYRSC qkeyret interacted w/ chewcane, QKEYRIV qkeyret interacted w/ indigveg, QKEYRON qkeyret interacted w/ onions, QKEYRPU qkeyret interacted w/ pumpkin, QKEYRPP qkeyret interacted w/ pawpaw, ZEROQRET nzerohrv interacted w/ qkeyret, QKEYRSU qkeyret interacted w/ sukuma, NADULT # of adults in hh, QKEYRMG qkeyret interacted w/ mango, CBBGRET, QKEYRAV qkeyret interacted w/ avocado, PRODYEAR Farmer's view about production year 1999/2000, NFV number of f&v produced, AVOCRET, NSLDQRET nsold interacted w/ qkeyret, SUKRET, PUMPRET, NSOLD number of f&v sold, ONIONRET, NFVQRET nfv interacted w/ qkeyret

b Dependent Variable: VRETNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	898.958	1762.505		.510	.610
NFV number of f&v produced	266.592	157.581	.095	1.692	.092
NFVQRET nfv interacted w/ qkeyret	.564	.109	.855	5.182	.000
NSLDQRET nsold interacted w/ qkeyret	-.598	.153	-.601	-3.896	.000
NSOLD number of f&v sold	514.161	222.139	.143	2.315	.021
NADULT # of adults in hh	321.860	149.673	.083	2.150	.032
ZEROQRET nzerohrv interacted w/ qkeyret	-.304	.083	-.148	-3.666	.000
PRODYEAR Farmer's view about production year 1999/2000	227.760	638.804	.014	.357	.722
QKEYRSU qkeyret interacted w/ sukuma	3.521	1.450	.120	2.428	.016
SUKRET	-3192.605	1544.352	-.104	-2.067	.039
QKEYRPU qkeyret interacted w/ pumpkin	13.412	7.724	.089	1.737	.083
PUMPRET	-4479.244	3067.402	-.075	-1.460	.145
QKEYRMG qkeyret interacted w/ mango	6.129	2.273	.104	2.697	.007
QKEYRAV qkeyret interacted w/ avocado	1.502	.415	.197	3.622	.000
AVOCRET	-2471.642	1039.874	-.105	-2.377	.018
CBBGRET	-5176.036	1683.479	-.129	-3.075	.002
QKEYRPP qkeyret interacted w/ pawpaw	4.051	3.235	.048	1.252	.211
QKEYRON qkeyret interacted w/ onions	40.497	23.387	.176	1.732	.084
ONIONRET	-13116.827	9687.040	-.137	-1.354	.177
QKEYRIV qkeyret interacted w/ indigveg	12.679	1.969	.246	6.439	.000
QKEYRSC qkeyret interacted w/ chewcane	2.281	1.216	.075	1.876	.061

a Dependent Variable: VRETNET

D. Sold Fruit & Vegetable, Zonal Models

Zone 1

Model

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.946(a)	.894	.883	13291.041 23	

a Predictors: (Constant), QKEYSSC qkeysold interacted w/ chewcane, LBRAREA, QKEYSCB qkeysold interacted w/ cabbage, QKEYSAV qkeysold interacted w/ avocado, QKEYSPP qkeysold interacted w/ pawpaw, QKEYSOR qkeysold interacted w/ orange, QKEYSPU qkeysold interacted w/ pumpkin, QKEYSMG qkeysold interacted w/ mango, QKEYSCC qkeysold interacted w/ coconut, QKEYSSU qkeysold interacted w/ sukuma, ORDCOMP order interacted with ecompare, NZEROHRV, QKEYSTO qkeysold interacted w/ tomato, NSOLD number of f&v sold, ZEROQSLD nzerohrv interacted w/ qkeysold, LBRQSLD hlbryes interacted w/ qkeysold, QKEYSOLD quant of prodn of key sales crop based on value sold approach

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-11263.415	3183.708		-3.538	.001
NSOLD number of f&v sold	2435.122	388.773	.194	6.264	.000
ORDCOMP order interacted with ecompare	502.445	282.964	.049	1.776	.078
ZEROQSLD nzerohrv interacted w/ qkeysold	-1.741	.136	-.869	-12.826	.000
NZEROHRV	845.830	296.992	.098	2.848	.005
LBRQSLD hlbryes interacted w/ qkeysold	8.056	.786	.745	10.249	.000
LBRAREA	-1713.733	511.685	-.129	-3.349	.001
QKEYSOLD quant of prodn of key sales crop based on value sold approach	25.085	1.079	3.683	23.252	.000
QKEYSTO qkeysold interacted w/ tomato	-17.387	1.510	-.371	-11.514	.000
QKEYSSU qkeysold interacted w/ sukuma	-20.355	3.193	-.171	-6.374	.000
QKEYSPU qkeysold interacted w/ pumpkin	-15.742	4.434	-.095	-3.550	.001
QKEYSMG qkeysold interacted w/ mango	-22.230	1.246	-.861	-17.846	.000
QKEYSAV qkeysold interacted w/ avocado	-20.452	1.110	-1.801	-18.428	.000
QKEYSCB qkeysold interacted w/ cabbage	-10.916	2.872	-.105	-3.801	.000
QKEYSPP qkeysold interacted w/ pawpaw	-21.809	3.792	-.154	-5.751	.000
QKEYSCC qkeysold interacted w/ coconut	-22.034	1.072	-2.478	-20.561	.000
QKEYSOR qkeysold interacted w/ orange	-13.603	1.958	-.217	-6.947	.000
QKEYSSC qkeysold interacted w/ chewcane	-22.013	2.179	-.291	-10.103	.000

a Dependent Variable: VSOLDNET

Sold Fruit & Vegetable, Zonal Models

Zone 2

Model Summary(b)

Model

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.845(a)	.714	.684	6040.79365	

a Predictors: (Constant), CHEWSLD, NADULT # of adults in hh, QKEYSMG qkeysold interacted w/ mango, QKEYSCP qkeysold interacted w/ cowplvs, QKEYSOR qkeysold interacted w/ orange, QKEYSAV qkeysold interacted w/ avocado, QKEYSSU qkeysold interacted w/ sukuma, QKEYSTO qkeysold interacted w/ tomato, QKEYSPP qkeysold interacted w/ pawpaw, QKEYSCB qkeysold interacted w/ cabbage, SCH_HEAD years of schooling for hh head, ZEROQSLD nzerohrv interacted w/ qkeysold, NSOLD number of f&v sold, FERTAREA, TOMSLD, SUKSLD, QKEYSIV qkeysold interacted w/ indigveg, FERTYES Used fertilizer, 1 yes, 0 no, FERTQSLD fertyes interacted w/ qkeysold, DMGQSLD ndamage interacted w/ qkeysold, NSLDQSLD nsold interacted w/ qkeysold, QKEYSOLD quant of prodn of key sales crop based on value sold approach

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-141.797	1166.969		-.122	.903
NSLDQSLD nsold interacted w/ qkeysold	.299	.229	.171	1.303	.194
NSOLD number of f&v sold	794.167	234.790	.161	3.382	.001
NADULT # of adults in hh	-297.584	141.923	-.082	-2.097	.037
SCH_HEAD years of schooling for hh head	129.729	100.649	.052	1.289	.199
DMGQSLD ndamage interacted w/ qkeysold	-.437	.334	-.160	-1.309	.192
ZEROQSLD nzerohrv interacted w/ qkeysold	.861	.336	.169	2.562	.011
FERTQSLD fertyes interacted w/ qkeysold	-14.466	2.082	-.974	-6.947	.000
FERTAREA	1017.603	151.126	.413	6.733	.000
FERTYES Used fertilizer, 1 yes, 0 no	-2524.489	1413.251	-.112	-1.786	.075
QKEYSOLD quant of prodn of key sales crop based on value sold approach	23.338	1.987	2.508	11.747	.000
QKEYSTO qkeysold interacted w/ tomato	-4.139	1.547	-.173	-2.675	.008
TOMSLD	-3366.664	1582.733	-.097	-2.127	.035
QKEYSSU qkeysold interacted w/ sukuma	-6.962	1.819	-.206	-3.827	.000
SUKSLD	-3201.589	1630.905	-.098	-1.963	.051
QKEYSMG qkeysold interacted w/ mango	-21.296	2.217	-1.346	-9.607	.000
QKEYSAV qkeysold interacted w/ avocado	-17.238	4.395	-.148	-3.922	.000
QKEYSCB qkeysold interacted w/ cabbage	-11.024	3.176	-.135	-3.471	.001
QKEYSPP qkeysold interacted w/ pawpaw	-20.326	2.797	-.360	-7.268	.000
QKEYSOR qkeysold interacted w/ orange	-19.803	2.641	-.370	-7.499	.000
QKEYSCP qkeysold interacted w/ cowplvs	-19.846	2.997	-.294	-6.622	.000
QKEYSIV qkeysold interacted w/ indigveg	-11.632	2.628	-.281	-4.427	.000
CHEWSLD	-183763.403	19867.763	-1.112	-9.249	.000

a Dependent Variable: VSOLDNET

Zone 3

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.940(a)	.883	.870	6898.12254	

a Predictors: (Constant), QKEYSSC qkeysold interacted w/ chewcane, NFVQSLD nfv interacted w/ qkeysold, QKEYSPP qkeysold interacted w/ pawpaw, QKEYSGV qkeysold interacted w/ guava, QKEYSIV qkeysold interacted w/ indigveg, QKEYSAV qkeysold interacted w/ avocado, QKEYSOR qkeysold interacted w/ orange, QKEYSON qkeysold interacted w/ onions, QKEYSSU qkeysold interacted w/ sukuma, QKEYSMG qkeysold interacted w/ mango, TACRES total cropped acres, QKEYSPU qkeysold interacted w/ pumpkin, CBBGSLD, SCH_HEAD years of schooling for hh head, NSOLD number of f&v sold, TOMSLD, NDAMAGE number of f&v damaged, HLBRYES used hired labour, SUKSLD, ZEROQSLD nzerohrv interacted w/ qkeysold, QKEYSCB qkeysold interacted w/ cabbage, LBRQSLD hlbryes interacted w/ qkeysold, FERTAREA, DMGQSLD ndamage interacted w/ qkeysold, FERTQSLD fertyes interacted w/ qkeysold, QKEYSTO qkeysold interacted w/ tomato, NSLDQSLD nsold interacted w/ qkeysold, QKEYSOLD quant of prodn of key sales crop based on value sold approach

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-439.160	1159.333		-.379	.705
NFVQSLD nfv interacted w/ qkeysold	-.368	.131	-.470	-2.815	.005
NSLDQSLD nsold interacted w/ qkeysold	.704	.286	.412	2.459	.015
NSOLD number of f&v sold	1027.771	243.071	.136	4.228	.000
SCH_HEAD years of schooling for hh head	156.184	97.988	.037	1.594	.112
TACRES total cropped acres	-204.767	66.474	-.158	-3.080	.002
DMGQSLD ndamage interacted w/ qkeysold	2.554	.202	.775	12.657	.000
NDAMAGE number of f&v damaged	-548.361	203.889	-.082	-2.690	.008
ZEROQSLD nzerohrv interacted w/ qkeysold	-.729	.163	-.137	-4.466	.000
FERTQSLD fertyes interacted w/ qkeysold	-8.632	1.013	-.847	-8.524	.000
FERTAREA	186.435	70.375	.135	2.649	.009
LBRQSLD hlbryes interacted w/ qkeysold	-5.714	1.515	-.242	-3.773	.000
HLBRYES used hired labour	10726.141	2450.790	.156	4.377	.000
QKEYSOLD quant of prodn of key sales crop based on value sold approach	18.935	1.971	1.909	9.608	.000
QKEYSTO qkeysold interacted w/ tomato	-7.122	1.685	-.602	-4.226	.000
TOMSLD	-4107.286	1743.366	-.067	-2.356	.019
QKEYSSU qkeysold interacted w/ sukuma	-8.358	1.882	-.177	-4.440	.000
SUKSLD	-3348.592	1358.184	-.068	-2.465	.014
QKEYSPU qkeysold interacted w/ pumpkin	-7.829	1.407	-.175	-5.565	.000
QKEYSMG qkeysold interacted w/ mango	-34.266	2.973	-.436	-11.526	.000
QKEYSAV qkeysold interacted w/ avocado	-16.752	3.481	-.113	-4.812	.000
QKEYSCB qkeysold interacted w/ cabbage	-9.915	1.684	-.420	-5.889	.000
CBBGSLD	-4644.844	2050.350	-.074	-2.265	.024
QKEYSPP qkeysold interacted w/ pawpaw	-24.529	8.954	-.061	-2.739	.007
QKEYSGV qkeysold interacted w/ guava	-17.833	4.801	-.085	-3.714	.000
QKEYSOR qkeysold interacted w/ orange	-6.659	1.291	-.166	-5.160	.000
QKEYSON qkeysold interacted w/ onions	-16.045	2.873	-.147	-5.585	.000
QKEYSIV qkeysold interacted w/ indigveg	-17.851	5.627	-.072	-3.172	.002
QKEYSSC qkeysold interacted w/ chewcane	-18.700	4.568	-.095	-4.093	.000

a Dependent Variable: VSOLDNET

Zone 4

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.881(a)	.777	.761	15086.20795	

a Predictors: (Constant), INDIGSLD, QKEYSPU qkeysold interacted w/ pumpkin, DMGQSLD ndamage interacted w/ qkeysold, ONIONSLD, NZEROHRV, ORDCOMP order interacted with ecompare, TOMSLD, FEMHEAD female headed hh, QKEYSSU qkeysold interacted w/ sukuma, AVOCSLD, PRODYEAR Farmer's view about production year 1999/2000, QKEYSAV qkeysold interacted w/ avocado, CBBGSLD, NDAMAGE number of f&v damaged, NSOLD number of f&v sold, SUKSLD, QKEYSON qkeysold interacted w/ onions, PUMPSLD, QKEYSIV qkeysold interacted w/ indigveg, QKEYSCB qkeysold interacted w/ cabbage, QKEYSOLD quant of prodn of key sales crop based on value sold approach, NSLDQSLD nsold interacted w/ qkeysold, NFVQSLD nfv interacted w/ qkeysold

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-3062.019	3270.285		-.936	.350
NFVQSLD nfv interacted w/ qkeysold	-1.268	.216	-1.049	-5.873	.000
NSLDQSLD nsold interacted w/ qkeysold	.667	.249	.374	2.676	.008
NSOLD number of f&v sold	2778.324	466.669	.258	5.954	.000
ORDCOMP order interacted with ecompare	296.532	226.682	.036	1.308	.192
FEMHEAD female headed hh	-3774.059	2359.328	-.043	-1.600	.111
DMGQSLD ndamage interacted w/ qkeysold	.839	.226	.218	3.716	.000
NDAMAGE number of f&v damaged	-564.477	394.119	-.051	-1.432	.153
NZEROHRV	-675.464	252.386	-.074	-2.676	.008
PRODYEAR Farmer's view about production year 1999/2000	3.203	2.107	.045	1.520	.129
QKEYSOLD quant of prodn of key sales crop based on value sold approach	15.110	1.970	1.139	7.669	.000
TOMSLD	-6423.106	3983.973	-.045	-1.612	.108
QKEYSSU qkeysold interacted w/ sukuma	-6.570	2.624	-.090	-2.504	.013
SUKSLD	-4055.054	3709.315	-.038	-1.093	.275
QKEYSPU qkeysold interacted w/ pumpkin	49.303	7.020	.261	7.023	.000
PUMPSLD	-31407.027	12438.845	-.095	-2.525	.012
QKEYSAV qkeysold interacted w/ avocado	-5.165	1.164	-.199	-4.437	.000
AVOCSLD	-6374.722	2953.898	-.067	-2.158	.032
QKEYSCB qkeysold interacted w/ cabbage	2.135	1.182	.129	1.807	.072
CBBGSLD	-11265.588	3444.395	-.127	-3.271	.001
QKEYSON qkeysold interacted w/ onions	10.008	5.310	.069	1.885	.060
ONIONSLD	-10007.723	5236.789	-.068	-1.911	.057
QKEYSIV qkeysold interacted w/ indigveg	35.694	5.015	.295	7.118	.000
INDIGSLD	-31784.770	9642.952	-.135	-3.296	.001

a Dependent Variable: VSOLDNET

E. Industrial Crops, Zonal Models

Zone 1

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
1.000(a)	.999	.998	170.44537	

a Predictors: (Constant), NDAMAGE Number of industrial crops damaged, FERTYES Used fertilizer, 1 yes, 0 no, SCH_HEAD years of schooling for hh head, PVASST02 Unstandardized Predicted Value, QKEYVOT, PRODYEAR Farmer's view about production year 1999/2000, QKEYV quant of key crop based on value approach, NZEROHRV, QKEYVCF, DMGQKEY ndamage interacted w/ qkeyv, FEMHEAD female headed hh, OTHER, FERTQKEY fertyes interacted w/ qkeyv, ZEROQKEY nzerohrv interacted w/ qkeyv

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	14.540	123.839		.117	.908
FEMHEAD female headed hh	1137.515	238.213	.079	4.775	.000
PVASST02 Unstandardized Predicted Value	-.002	.000	-.086	-4.825	.000
SCH_HEAD years of schooling for hh head	31.898	14.355	.034	2.222	.046
QKEYV quant of key crop based on value approach	.637	.030	.263	21.238	.000
QKEYVCF	25.997	.398	1.132	65.241	.000
QKEYVOT	4.385	2.921	.020	1.501	.159
FERTQKEY fertyes interacted w/ qkeyv	-9.470	1.285	-.217	-7.372	.000
DMGQKEY ndamage interacted w/ qkeyv	.881	.135	.092	6.511	.000
ZEROQKEY nzerohrv interacted w/ qkeyv	2.691	1.021	.080	2.636	.022
OTHER	1686.691	200.181	.140	8.426	.000
PRODYEAR Farmer's view about production year 1999/2000	-116.167	57.811	-.027	-2.009	.068
FERTYES Used fertilizer, 1 yes, 0 no	838.266	215.146	.101	3.896	.002
NZEROHRV	-281.295	149.955	-.045	-1.876	.085
NDAMAGE Number of industrial crops damaged	-161.893	98.005	-.026	-1.652	.124

a Dependent Variable: VSOLDNET

Industrial Crops, Zonal Models

Zone 2

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.999(a)	.998	.998	4166.29716	

a Predictors: (Constant), TACRES total cropped acres, DMGQKEY ndamage interacted w/ qkeyv, FERTQKEY fertyes interacted w/ qkeyv, PRODYEAR Farmer's view about production year 1999/2000, LBRQKEY hlbryes interacted w/ qkeyv, FERTAREA fertyes interacted with acres, LBRAREA hlbryes interacted with acres, NSLDQKEY nsold interacted w/ qkeyv, QKEYVSG, QKEYV quant of key crop based on value approach

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-2022.334	942.866		-2.145	.034
QKEYV quant of key crop based on value approach	1.044	.320	.643	3.268	.001
QKEYVSG	.557	.315	.344	1.766	.080
DMGQKEY ndamage interacted w/ qkeyv	-.036	.015	-.016	-2.453	.015
LBRQKEY hlbryes interacted w/ qkeyv	-.041	.016	-.020	-2.569	.011
NSLDQKEY nsold interacted w/ qkeyv	.035	.030	.023	1.160	.248
FERTQKEY fertyes interacted w/ qkeyv	.030	.020	.017	1.508	.134
LBRAREA hlbryes interacted with acres	-439.002	158.960	-.027	-2.762	.007
PRODYEAR Farmer's view about production year 1999/2000	1112.522	432.277	.011	2.574	.011
FERTAREA fertyes interacted with acres	-432.516	137.268	-.024	-3.151	.002
TACRES total cropped acres	286.100	171.136	.015	1.672	.097

a Dependent Variable: VSOLDNET

Industrial Crops, Zonal Models

Zone 3

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.999(a)	.997	.997	6813.71050	

a Predictors: (Constant), COFFEE, NADULT # of adults in hh, ZEROQKEY nzerohrv interacted w/ qkeyv, PVASST02 Unstandardized Predicted Value, NSOLD Number of industrial crops sold, QKEYVPY, QKEYVTE, HLBRYES used hired labour, DMGQKEY ndamage interacted w/ qkeyv, FERTAREA fertyes interacted with acres, FERTQKEY fertyes interacted w/ qkeyv

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-819.207	7270.496		-.113	.911
NADULT # of adults in hh	-778.929	313.967	-.017	-2.481	.015
PVASST02 Unstandardized Predicted Value	-.013	.004	-.021	-3.217	.002
NSOLD Number of industrial crops sold	9173.277	7073.782	.008	1.297	.199
QKEYVPY	69.348	8.349	.055	8.306	.000
QKEYVTE	5.322	3.914	.339	1.360	.178
DMGQKEY ndamage interacted w/ qkeyv	-1.637	.252	-.050	-6.505	.000
ZEROQKEY nzerohrv interacted w/ qkeyv	3.251	1.055	.020	3.080	.003
FERTQKEY fertyes interacted w/ qkeyv	11.616	3.950	.739	2.941	.004
FERTAREA fertyes interacted with acres	-1213.995	286.672	-.049	-4.235	.000
HLBRYES used hired labour	-5460.470	1810.019	-.022	-3.017	.004
COFFEE	6145.804	3109.470	.013	1.976	.052

a Dependent Variable: VSOLDNET

Industrial Crops, Zonal Models

Zone 4

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.979(a)	.958	.957	15927.30188	

a Predictors: (Constant), OTHER, LBRAREA hlbryes interacted with acres, FEMHEAD female headed hh, NDAMAGE Number of industrial crops damaged, PRODYEAR Farmer's view about production year 1999/2000, QKEYVCF, NSOLD Number of industrial crops sold, QKEYVTE, DMGQKEY ndamage interacted w/ qkeyv, QKEYVOT, NSLDQKEY nsold interacted w/ qkeyv, LBRQKEY hlbryes interacted w/ qkeyv, FERTQKEY fertyes interacted w/ qkeyv

b Dependent Variable: VSOLDNET

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-5154.453	2835.010		-1.818	.070
FEMHEAD female headed hh	3809.204	2561.211	.017	1.487	.138
NSOLD Number of industrial crops sold	3955.139	1513.901	.037	2.613	.009
QKEYVCF	24.698	1.572	.515	15.716	.000
QKEYVTE	20.717	1.522	.886	13.611	.000
QKEYVOT	36.782	15.716	.059	2.340	.020
FERTQKEY fertyes interacted w/ qkeyv	-3.012	1.525	-.134	-1.975	.049
NSLDQKEY nsold interacted w/ qkeyv	2.651	.288	.251	9.193	.000
DMGQKEY ndamage interacted w/ qkeyv	-2.475	.265	-.183	-9.352	.000
LBRQKEY hlbryes interacted w/ qkeyv	1.371	.685	.058	2.001	.046
PRODYEAR Farmer's view about production year 1999/2000	-8.471	2.184	-.047	-3.878	.000
NDAMAGE Number of industrial crops damaged	2666.692	1054.065	.036	2.530	.012
LBRAREA hlbryes interacted with acres	-824.716	370.740	-.034	-2.225	.027
OTHER	-28908.623	20655.782	-.035	-1.400	.163

a Dependent Variable: VSOLDNET

F. Livestock, Zonal Models

Zone 1

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.820(a)	.673	.652	15807.06224	

a Predictors: (Constant), INT_GCOW, NCHICK, SOLDCBUL, SOLDHNY, SOLDMK, SOLDHIDE, NCCALF, NSOLD_LV, NLBULL, NSHEEP, NGCALF, NPROD_LP, NGOAT

b Dependent Variable: VNET_LV Net value livestock income

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-8408.781	3065.337		-2.743	.007
NPROD_LP	7810.978	2176.520	.231	3.589	.000
NLBULL	-2504.211	910.495	-.160	-2.750	.006
NGCALF	39384.281	8062.408	.300	4.885	.000
NCCALF	5514.014	2460.414	.104	2.241	.026
NSHEEP	620.888	457.080	.099	1.358	.176
NGOAT	244.475	99.120	.220	2.466	.014
NCHICK	302.438	90.919	.207	3.326	.001
NSOLD_LV	5922.187	1751.136	.164	3.382	.001
SOLDCBUL	26444.517	10280.936	.116	2.572	.011
SOLDMK	10043.205	2918.763	.174	3.441	.001
SOLDHNY	-8364.227	5241.071	-.072	-1.596	.112
SOLDHIDE	-8659.147	4172.113	-.111	-2.075	.039
INT_GCOW	12751.882	5182.232	.158	2.461	.015

a Dependent Variable: VNET_LV Net value livestock income

Livestock, Zonal Models

Zone 2

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.730(a)	.533	.508	14840.50375	

a Predictors: (Constant), INT_GCOW, SOLDCBUL, NCHICK, NLCALF, NDUCK, FEMHEAD female headed hh, NSOLD_LV, SOLDGBUL, SCH_HEAD years of schooling for hh head, SOLDGCOW, NLCOW, NGBULL, NGCOW

b Dependent Variable: VNET_LV Net value livestock income

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	4208.773	2154.558		1.953	.052
SCH_HEAD years of schooling for hh head	-567.905	237.306	-.118	-2.393	.017
FEMHEAD female headed hh	-4416.253	2645.914	-.080	-1.669	.096
NGCOW	-12693.225	6792.222	-.203	-1.869	.063
NLCOW	1288.536	544.300	.127	2.367	.019
NGBULL	-136651.321	24739.047	-.571	-5.524	.000
NLCALF	3118.284	819.701	.197	3.804	.000
NCHICK	191.131	99.822	.087	1.915	.057
NDUCK	1856.674	865.183	.097	2.146	.033
NSOLD_LV	9492.291	1293.257	.344	7.340	.000
SOLDGCOW	117095.668	15126.095	.489	7.741	.000
SOLDGBUL	75219.940	26238.753	.223	2.867	.005
SOLDCBUL	66724.976	15294.133	.198	4.363	.000
INT_GCOW	38677.162	8087.913	.566	4.782	.000

a Dependent Variable: VNET_LV Net value livestock income

Livestock, Zonal Models

Zone 3

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.882(a)	.778	.772	42074.50983	

a Predictors: (Constant), INT_CHIC, NLCALF, NSOLD_LV, NGBULL, NCCALF, ORDCOMP order interacted with ecompare, SOLDGCOW, SOLDCCOW, NSHEEP, NGCALF
b Dependent Variable: VNET_LV Net value livestock income

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-9863.021	5738.234		-1.719	.086
ORDCOMP order interacted with ecompare	2180.696	549.978	.104	3.965	.000
NGBULL	25674.329	10627.666	.073	2.416	.016
NGCALF	13311.653	2026.348	.225	6.569	.000
NCCALF	7210.394	841.777	.235	8.566	.000
NLCALF	4029.659	1101.548	.110	3.658	.000
NSHEEP	-975.345	321.786	-.093	-3.031	.003
NSOLD_LV	7182.689	2305.887	.093	3.115	.002
SOLDGCOW	46701.200	8976.448	.156	5.203	.000
SOLDCCOW	12458.441	6609.674	.056	1.885	.060
INT_CHIC	801.507	29.278	.688	27.376	.000

a Dependent Variable: VNET_LV Net value livestock income

Livestock, Zonal Models

Zone 4

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.561(a)	.314	.293	31824.57607	

a Predictors: (Constant), INT_GCOW, SOLDHNY, NDUCK, NSOLD_LV, SCH_HEAD years of schooling for hh head, NADULT # of adults in hh, NSHEEP, ORDCOMP order interacted with ecompare, NPROD_LP, NCCOW

b Dependent Variable: VNET_LV Net value livestock income

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-18886.147	8351.036		-2.262	.024
NADULT # of adults in hh	1472.576	669.990	.107	2.198	.029
ORDCOMP order interacted with ecompare	437.315	471.359	.045	.928	.354
SCH_HEAD years of schooling for hh head	662.908	425.818	.074	1.557	.121
NPROD_LP	7249.375	3639.473	.102	1.992	.047
NCCOW	6429.993	2541.349	.135	2.530	.012
NSHEEP	-2261.054	1762.017	-.061	-1.283	.200
NDUCK	-7232.689	4137.208	-.083	-1.748	.081
NSOLD_LV	7301.838	2125.522	.167	3.435	.001
SOLDHNY	27778.957	19399.561	.070	1.432	.153
INT_GCOW	17475.269	2099.111	.467	8.325	.000

a Dependent Variable: VNET_LV Net value livestock income

G. Informal Off-Farm, Zonal Models

Zone 1

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.741(a)	.550	.526	44815.07640	

a Predictors: (Constant), MTHBIKE, MTHTIMB, MINE mining business, DRIVER driver, MTHFSH, PVASST02 Unstandardized Predicted Value, NADULT # of adults in hh, NMTHS # of months hh had income from informal activities, TRANS transport business, ORDCOMP order interacted with cash income

b Dependent Variable: VINFORM earnings from all informal off-farm activities

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-31251.101	12372.036		-2.526	.012
PVASST02 Unstandardized Predicted Value	.049	.014	.171	3.397	.001
ORDCOMP order interacted with cash income	1600.059	1088.766	.077	1.470	.143
NMTHS # of months hh had income from informal activities	3111.325	862.127	.186	3.609	.000
MTHTIMB	32025.551	3780.894	.420	8.470	.000
DRIVER driver	138859.886	23353.210	.301	5.946	.000
MINE mining business	166730.120	32437.709	.257	5.140	.000
MTHFSH	4313.994	1202.770	.187	3.587	.000
NADULT # of adults in hh	2611.437	1162.089	.116	2.247	.026
TRANS transport business	-42714.775	21314.524	-.103	-2.004	.047
MTHBIKE	5332.797	2707.408	.097	1.970	.050

a Dependent Variable: VINFORM earnings from all informal off-farm activities

Informal Off-Farm, Zonal Models

Zone 2

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.803(a)	.645	.624	33754.08641	

a Predictors: (Constant), MTHTIMB, MTHTRANS, HAWK hawking, MTHCARP, SCH_HEAD years of schooling for hh head, RENT rental business, NADULT # of adults in hh, WAGERATE Daily wagerate, NPEOPLE # of people earning informal income, PVASST02 Unstandardized Predicted Value, MTHJAGG

b Dependent Variable: VINFORM earnings from all informal off-farm activities

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-6967.077	12491.965		-.558	.578
SCH_HEAD years of schooling for hh head	824.366	571.518	.066	1.442	.151
PVASST02 Unstandardized Predicted Value	.154	.033	.235	4.594	.000
NADULT # of adults in hh	1818.775	919.691	.096	1.978	.049
WAGERATE Daily wagerate	-281.071	162.421	-.080	-1.731	.085
NPEOPLE # of people earning informal income	12749.328	5304.512	.113	2.403	.017
MTHJAGG	9809.908	2066.884	.261	4.746	.000
MTHTRANS	25402.716	3580.051	.393	7.096	.000
HAWK hawking	64008.656	16306.853	.183	3.925	.000
RENT rental business	40678.896	11114.726	.169	3.660	.000
MTHCARP	1959.687	1076.295	.082	1.821	.070
MTHTIMB	2533.120	1661.087	.067	1.525	.129

a Dependent Variable: VINFORM earnings from all informal off-farm activities

Informal Off-Farm, Zonal Models

Zone 3

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.507(a)	.257	.228	91678.54995	

a Predictors: (Constant), MTHBREW, NPEOPLE # of people earning informal income, RENT rental business, NMTHS # of months hh had income from informal activities, PVASST02 Unstandardized Predicted Value, ORDCOMP order interacted with cash income, FKIB farm kibarua, NPPLSQ
b Dependent Variable: VINFORM earnings from all informal off-farm activities

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-123839.918	34049.985		-3.637	.000
ORDCOMP order interacted with cash income	7780.774	2112.632	.249	3.683	.000
PVASST02 Unstandardized Predicted Value	.110	.032	.223	3.388	.001
FKIB farm kibarua	-43053.826	17759.421	-.182	-2.424	.016
NMTHS # of months hh had income from informal activities	4797.670	1864.602	.161	2.573	.011
RENT rental business	-25560.470	17710.623	-.089	-1.443	.150
NPEOPLE # of people earning informal income	74421.658	33175.035	.554	2.243	.026
NPPLSQ	-10432.572	6789.869	-.366	-1.536	.126
MTHBREW	-5329.107	3499.001	-.092	-1.523	.129

a Dependent Variable: VINFORM earnings from all informal off-farm activities

Informal Off-Farm, Zonal Models

Zone 4

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.704(a)	.496	.464	80871.92539	

a Predictors: (Constant), MTHFKIB, MTHTIMB, MTHRENT, WAGERATE Daily wagerate, MTHAGTRD, SCH_HEAD years of schooling for hh head, ORDCOMP order interacted with cash income, NMTHS # of months hh had income from informal activities, NPEOPLE # of people earning informal income, PVASST02 Unstandardized Predicted Value, RENT rental business
b Dependent Variable: VINFORM earnings from all informal off-farm activities

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-109004.904	28468.493		-3.829	.000
SCH_HEAD years of schooling for hh head	-1944.457	1532.916	-.073	-1.268	.206
PVASST02 Unstandardized Predicted Value	.175	.035	.314	4.995	.000
ORDCOMP order interacted with cash income	7455.339	1966.758	.235	3.791	.000
NMTHS # of months hh had income from informal activities	3183.883	1656.226	.115	1.922	.056
NPEOPLE # of people earning informal income	13809.235	11423.637	.073	1.209	.228
WAGERATE Daily wagerate	506.540	230.467	.123	2.198	.029
MTHTIMB	26297.069	3802.570	.397	6.916	.000
MTHAGTRD	3577.827	1606.443	.124	2.227	.027
RENT rental business	-636606.227	400687.332	-1.160	-1.589	.114
MTHRENT	51922.461	35032.231	1.079	1.482	.140
MTHFKIB	-1071.322	1469.015	-.046	-.729	.467

a Dependent Variable: VINFORM earnings from all informal off-farm activities

H. Salaries and Remittances, Zonal Models

Zone 1

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.798(a)	.637	.606	41036.11433	

a Predictors: (Constant), MTHWATCH, SCH_HEAD years of schooling for hh head, MTHSHOP, MTHPOL, MTHCLERK, MTHDRIVE, MTHMGR, MTHREMIT, MTHSALES, MTHTEACH, MTHPENS, ORDCOMP order interacted with ecompare, NPEOPLE # of people earning sal or remit, NMTHS # of months hh had income from sal or remit

b Dependent Variable: VSALREM earnings from all salary and remittance

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-69688.232	12345.862		-5.645	.000
NPEOPLE # of people earning sal or remit	6481.401	5342.638	.071	1.213	.227
NMTHS # of months hh had income from sal or remit	2910.438	1094.872	.167	2.658	.009
SCH_HEAD years of schooling for hh head	2664.169	756.453	.181	3.522	.001
ORDCOMP order interacted with ecompare	5255.166	902.478	.320	5.823	.000
MTHREMIT	-677.167	826.791	-.056	-.819	.414
MTHTEACH	5141.314	994.561	.286	5.169	.000
MTHDRIVE	4489.422	1257.727	.182	3.569	.000
MTHMGR	10769.605	2078.873	.256	5.181	.000
MTHPENS	-1340.316	1305.395	-.054	-1.027	.306
MTHCLERK	3630.966	1902.485	.096	1.909	.058
MTHSALES	4357.810	1979.906	.108	2.201	.029
MTHPOL	2271.659	2026.528	.054	1.121	.264
MTHSHOP	2928.393	1967.799	.080	1.488	.139
MTHWATCH	-1778.914	1729.866	-.052	-1.028	.305

a Dependent Variable: VSALREM earnings from all salary and remittance

Salaries and Remittances, Zonal Models

Zone 2

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.704(a)	.496	.468	43692.46523	

a Predictors: (Constant), MTHCLERK, NPEOPLE # of people earning sal or remit, MTHTEACH, MTHMGR, MTHPENS, PVASST02 Unstandardized Predicted Value, NMTHS # of months hh had income from sal or remit, SCH_HEAD years of schooling for hh head, ORDCOMP order interacted with ecompare

b Dependent Variable: VSALREM earnings from all salary and remittance

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-58186.314	12038.151		-4.833	.000
NPEOPLE # of people earning sal or remit	33522.178	5391.670	.360	6.217	.000
NMTHS # of months hh had income from sal or remit	1667.729	938.769	.113	1.777	.078
PVASST02 Unstandardized Predicted Value	.040	.037	.066	1.086	.279
SCH_HEAD years of schooling for hh head	2065.134	859.876	.156	2.402	.017
ORDCOMP order interacted with ecompare	1366.761	963.926	.093	1.418	.158
MTHTEACH	3095.462	948.965	.207	3.262	.001
MTHMGR	3616.480	2186.160	.095	1.654	.100
MTHPENS	2329.378	1318.657	.104	1.766	.079
MTHCLERK	3667.307	1330.336	.163	2.757	.007

a Dependent Variable: VSALREM earnings from all salary and remittance

Salaries and Remittances, Zonal Models

Zone 3

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Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.829(a)	.687	.665	49809.98011	

a Predictors: (Constant), MTHLEC, MTHMGR, MTHBANK, MTHPOL, MTHFARM, FEMHEAD female headed hh, MTHPENS, MTHREMIT, NPEOPLE # of people earning sal or remit, WAGERATE Daily wagerate, NMTHS # of months hh had income from sal or remit, SCH_HEAD years of schooling for hh head, ORDCINC order interacted with cash income

b Dependent Variable: VSALREM earnings from all salary and remittance

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-123480.233	18879.941		-6.540	.000
NPEOPLE # of people earning sal or remit	67491.693	7904.948	.453	8.538	.000
NMTHS # of months hh had income from sal or remit	4851.124	1063.831	.208	4.560	.000
WAGERATE Daily wagerate	238.792	196.004	.053	1.218	.225
SCH_HEAD years of schooling for hh head	4142.078	877.734	.241	4.719	.000
FEMHEAD female headed hh	18409.472	11461.247	.070	1.606	.110
ORDCINC order interacted with cash income	.018	.007	.138	2.476	.014
MTHREMIT	-2782.777	856.121	-.154	-3.250	.001
MTHMGR	15439.852	2450.477	.263	6.301	.000
MTHPENS	-3736.420	1452.916	-.109	-2.572	.011
MTHPOL	2773.551	2169.673	.054	1.278	.203
MTHFARM	-5072.211	1707.774	-.125	-2.970	.003
MTHBANK	9461.554	2231.993	.186	4.239	.000
MTHLEC	16238.312	3045.265	.226	5.332	.000

a Dependent Variable: VSALREM earnings from all salary and remittance

Salaries and Remittances, Zonal Models

Zone 4

Model Summary(b)

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.877(a)	.768	.748	32494.49230	

a Predictors: (Constant), MTHCHIEF, PVASST02 Unstandardized Predicted Value, MTHPOL, MTHSALES, MTHLEC, MTHDRIVE, MTHCLERK, MTHIND, FEMHEAD female headed hh, MTHCIVIL, MTHWATCH, NPEOPLE # of people earning sal or remit, NMTHS # of months hh had income from sal or remit, NADULT # of adults in hh, MTHTEACH, MTHREMIT, SCH_HEAD years of schooling for hh head, ORDCINC order interacted with cash income

b Dependent Variable: VSALREM earnings from all salary and remittance

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-60008.131	10422.249		-5.758	.000
NPEOPLE # of people earning sal or remit	44281.602	5198.729	.338	8.518	.000
NMTHS # of months hh had income from sal or remit	1781.927	756.740	.090	2.355	.019
PVASST02 Unstandardized Predicted Value	.045	.015	.130	3.073	.002
NADULT # of adults in hh	-1153.658	843.397	-.050	-1.368	.173
SCH_HEAD years of schooling for hh head	2156.102	644.955	.145	3.343	.001
FEMHEAD female headed hh	27491.738	6337.751	.154	4.338	.000
ORDCINC order interacted with cash income	.005	.006	.047	.926	.355
MTHREMIT	-1337.522	495.348	-.116	-2.700	.008
MTHTEACH	4198.708	681.652	.275	6.160	.000
MTHDRIVE	6945.916	853.261	.300	8.140	.000
MTHIND	3540.477	1012.836	.122	3.496	.001
MTHCLERK	4350.047	822.591	.195	5.288	.000
MTHSALES	5806.857	2445.994	.082	2.374	.019
MTHPOL	7548.091	1969.559	.131	3.832	.000
MTHWATCH	1645.652	928.100	.063	1.773	.078
MTHCIVIL	5656.192	1631.649	.120	3.467	.001
MTHLEC	17056.082	2793.007	.210	6.107	.000
MTHCHIEF	8700.752	1281.186	.238	6.791	.000

a Dependent Variable: VSALREM earnings from all salary and remittance

CONDITIONAL MODELS

A. Retained Cereals and Tubers, Conditional Models

Per Capita Income Quintile 1

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.847(a)	.718	.697	3870.36598	

a Predictors: (Constant), PRODYR3, ZEROQRET nzerohrv interacted w/ qkeyret, STPOTRET, ARROWRET, SCH_HEAD years of schooling for hh head, QKEYRGRM qkeyret interacted with green maize, QKEYRSO qkeyret interacted with sorghum, HHSIZE hh size, PVASSET3, QKEYRRI qkeyret interacted with rice, QKEYRGRG qkeyret interacted with greengrams, ORDCOMP order interacted with ecompare, NDAMAGE number of ctp damaged, FEMHEAD2, HLBRYES2, NCTPQRET nctp interacted w/ qkeyret, PRODYR2, TACRES3, TACRES2

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	1107.181	939.679		1.178	.240
NCTPQRET nctp interacted w/ qkeyret	1.853	.104	.803	17.778	.000
QKEYRRI qkeyret interacted with rice	-5.523	1.723	-.119	-3.204	.002
QKEYRGRM qkeyret interacted with green maize	4.193	2.491	.061	1.683	.094
QKEYRGRG qkeyret interacted with greengrams	9.572	3.286	.103	2.913	.004
QKEYRSO qkeyret interacted with sorghum	5.920	3.289	.064	1.800	.073
STPOTRET	-1433.536	608.864	-.083	-2.354	.019
ARROWRET	-13267.030	4046.180	-.115	-3.279	.001
ZEROQRET nzerohrv interacted w/ qkeyret	-.344	.088	-.159	-3.905	.000
NDAMAGE number of ctp damaged	-247.766	80.148	-.118	-3.091	.002
HHSIZE hh size	333.393	70.542	.176	4.726	.000
FEMHEAD2	-1544.608	785.798	-.079	-1.966	.050
ORDCOMP order interacted with ecompare	150.702	72.840	.078	2.069	.040
PVASSET3	-.011	.004	-.120	-2.737	.007
SCH_HEAD years of schooling for hh head	-123.793	66.962	-.065	-1.849	.066
HLBRYES2	-3359.027	751.163	-.184	-4.472	.000
TACRES2	-450.735	185.704	-.120	-2.427	.016
TACRES3	-648.578	228.837	-.137	-2.834	.005
PRODYR2	879.316	319.692	.131	2.751	.006
PRODYR3	2.206	1.491	.053	1.480	.140

a Dependent Variable: VRETCTP

Retained Cereals and Tubers, Conditional Models

Per Capita Income Quintile 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.737(a)	.544	.515	6422.47658	

a Predictors: (Constant), FERTAREA fertyes interacted w/ tacres, QKEYRRI qkeyret interacted with rice, QKEYRARR qkeyret interacted with arrowroots, IRPOTRET, FEMHEAD1, NSOLD2, NSOLD1, QKEYRET quant of prodn of key retained crop based on quantity retained approach, FERTYES1, NZEROHRV # of crops w/ failed harvest, FEMHEAD female headed hh, NDAMAGE number of ctp damaged, TACRES3, NCTP number of ctp produced, LBRQRET hlbryes interacted w/ qkeyret, FERTQRET fertyes interacted w/ qkeyret

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	2165.438	1080.254		2.005	.046
QKEYRET quant of prodn of key retained crop based on quantity retained approach	11.742	1.011	1.388	11.620	.000
QKEYRARR qkeyret interacted with arrowroots	9.846	3.206	.131	3.071	.002
QKEYRRI qkeyret interacted with rice	-5.022	1.993	-.112	-2.520	.012
NCTP number of ctp produced	978.717	150.730	.436	6.493	.000
NDAMAGE number of ctp damaged	-718.582	145.895	-.332	-4.925	.000
NZEROHRV # of crops w/ failed harvest	-213.251	153.815	-.068	-1.386	.167
LBRQRET hlbryes interacted w/ qkeyret	-2.651	.707	-.311	-3.751	.000
FERTQRET fertyes interacted w/ qkeyret	-5.432	.989	-.663	-5.492	.000
FEMHEAD female headed hh	-2113.191	1346.505	-.079	-1.569	.118
FEMHEAD1	4096.988	2561.587	.084	1.599	.111
TACRES3	-234.330	153.602	-.098	-1.526	.128
NSOLD1	1497.717	446.862	.163	3.352	.001
NSOLD2	-830.170	340.769	-.111	-2.436	.016
FERTYES1	-7792.997	2269.495	-.159	-3.434	.001
IRPOTRET	-3161.820	1865.741	-.073	-1.695	.091
FERTAREA fertyes interacted w/ tacres	259.330	122.329	.134	2.120	.035

a Dependent Variable: VRETCTP

Retained Cereals and Tubers, Conditional Models

Per Capita Income Quintile 3

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.794(a)	.631	.606	7254.91856	

a Predictors: (Constant), STPOTRET, NCTPQRET nctp interacted w/ qkeyret, FEMHEAD3, NDAMAGE2, NZEROHRV # of crops w/ failed harvest, NDAMAGE3, FEMHEAD2, TACRES1, QKEYRIP qkeyret interacted with irishpotatoes, NCTP number of ctp produced, TACRES2, QKEYRSTP qkeyret interacted with sweetpotatoes, NDAMAGE1, LBRQRET hlbryes interacted w/ qkeyret, NSLDQRET nsold interacted w/ qkeyret, FERTQRET fertyes interacted w/ qkeyret, QKEYRET quant of prodn of key retained crop based on quantity retained approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-203.055	1467.991		-.138	.890
NCTPQRET nctp interacted w/ qkeyret	.357	.148	.311	2.419	.016
NCTP number of ctp produced	924.006	172.438	.327	5.358	.000
QKEYRET quant of prodn of key retained crop based on quantity retained approach	10.284	1.372	1.379	7.496	.000
QKEYRIP qkeyret interacted with irishpotatoes	-3.070	.584	-.236	-5.255	.000
QKEYRSTP qkeyret interacted with sweetpotatoes	5.840	1.661	.191	3.517	.001
NDAMAGE1	-471.003	230.031	-.136	-2.048	.042
NDAMAGE2	-1479.663	309.362	-.242	-4.783	.000
NDAMAGE3	-433.646	279.976	-.065	-1.549	.123
NZEROHRV # of crops w/ failed harvest	-319.884	127.768	-.104	-2.504	.013
NSLDQRET nsold interacted w/ qkeyret	-.722	.173	-.359	-4.174	.000
FERTQRET fertyes interacted w/ qkeyret	-3.660	.892	-.496	-4.105	.000
LBRQRET hlbryes interacted w/ qkeyret	-2.369	.721	-.325	-3.285	.001
TACRES2	1132.241	195.933	.313	5.779	.000
FEMHEAD2	-5837.639	3124.497	-.080	-1.868	.063
FEMHEAD3	6978.404	2863.666	.096	2.437	.016
TACRES1	463.801	220.088	.134	2.107	.036
STPOTRET	-3436.711	2118.583	-.086	-1.622	.106

a Dependent Variable: VRETCTP

Retained Cereals and Tubers, Conditional Models

Per Capita Income Quintile 4

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.938(a)	.881	.871	11926.94056	

a Predictors: (Constant), YAMSRET, LBRQRET hlbryes interacted w/ qkeyret, NZERO1, QKEYRSTP qkeyret interacted with sweetpotatoes, QKEYRWH qkeyret interacted with wheat, PVASSET2, ORDCOMP order interacted with ecompare, FERTYES Used fertilizer, NCTP number of ctp produced, NSOLD3, HLBRYES used hired labour, HLBRYES1, QKEYRYA qkeyret interacted with yams, NDAMAGE3, TACRES2, SCHHEAD3, FERTQRET fertyes interacted w/ qkeyret, TACRES1, NCTPQRET nctp interacted w/ qkeyret, NSLDQRET nsold interacted w/ qkeyret, QKEYRET quant of prodn of key retained crop based on quantity retained approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-12531.813	4004.458		-3.129	.002
NCTPQRET nctp interacted w/ qkeyret	.464	.134	.263	3.466	.001
NCTP number of ctp produced	759.393	269.015	.087	2.823	.005
QKEYRET quant of prodn of key retained crop based on quantity retained approach	21.120	1.408	1.683	15.001	.000
QKEYRYA qkeyret interacted with yams	14.414	2.375	.192	6.069	.000
QKEYRWH qkeyret interacted with wheat	4.125	1.900	.050	2.171	.031
QKEYRSTP qkeyret interacted with sweetpotatoes	-4.154	1.620	-.066	-2.564	.011
NDAMAGE3	-1158.530	597.862	-.060	-1.938	.054
NZERO1	-412.516	223.380	-.044	-1.847	.066
FERTQRET fertyes interacted w/ qkeyret	-12.765	.781	-.879	-16.336	.000
LBRQRET hlbryes interacted w/ qkeyret	-5.285	.823	-.414	-6.423	.000
NSLDQRET nsold interacted w/ qkeyret	-1.276	.237	-.314	-5.381	.000
ORDCOMP order interacted with ecompare	303.977	203.630	.035	1.493	.137
SCHHEAD3	-588.410	245.135	-.078	-2.400	.017
TACRES2	659.739	414.126	.048	1.593	.112
PVASSET2	-.019	.014	-.040	-1.373	.171
TACRES1	1397.266	302.214	.192	4.623	.000
FERTYES Used fertilizer	10858.974	2085.146	.141	5.208	.000
HLBRYES1	-14043.108	4373.504	-.111	-3.211	.001
NSOLD3	3073.141	746.734	.134	4.115	.000
HLBRYES used hired labour	3824.161	2006.895	.058	1.906	.058
YAMSRET	-17159.120	5921.688	-.082	-2.898	.004

a Dependent Variable: VRETCTP

Retained Cereals and Tubers, Conditional Models

Per Capita Income Quintile 5

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.900(a)	.810	.795	13009.44416	

a Predictors: (Constant), FERTYES3, QKEYRPIP qkeyret interacted with pigeon peas, QKEYRCOW qkeyret interacted with cowpeas, QKEYRSTP qkeyret interacted with sweetpotatoes, NSOLD number of ctp sold, PRODYR3, ORDCOMP order interacted with ecompare, QKEYRIP qkeyret interacted with irishpotatoes, FERTYES Used fertilizer, TACRES1, DMGQRET ndamage interacted w/ qkeyret, LBRQRET hlbryes interacted w/ qkeyret, NSOLD1, NDAMAGE3, NSOLD3, ZEROQRET nzerohrv interacted w/ qkeyret, NSLDQRET nsold interacted w/ qkeyret, QKEYRET quant of prodn of key retained crop based on quantity retained approach, NCTPQRET nctp interacted w/ qkeyret

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	2222.803	3584.807		.620	.536
NCTPQRET nctp interacted w/ qkeyret	.378	.102	.532	3.719	.000
QKEYRET quant of prodn of key retained crop based on quantity retained approach	3.224	.653	.634	4.938	.000
QKEYRPIP qkeyret interacted with pigeon peas	13.376	1.178	.349	11.357	.000
QKEYRCOW qkeyret interacted with cowpeas	27.514	3.855	.395	7.137	.000
QKEYRSTP qkeyret interacted with sweetpotatoes	4.682	.532	.454	8.796	.000
QKEYRIP qkeyret interacted with irishpotatoes	-2.721	.645	-.171	-4.217	.000
ZEROQRET nzerohrv interacted w/ qkeyret	-.872	.310	-.238	-2.810	.005
PRODYR3	8.122	4.081	.062	1.990	.048
NDAMAGE3	-1845.813	740.278	-.109	-2.493	.013
LBRQRET hlbryes interacted w/ qkeyret	-1.780	.387	-.338	-4.594	.000
NSLDQRET nsold interacted w/ qkeyret	-.545	.143	-.469	-3.812	.000
DMGQRET ndamage interacted w/ qkeyret	.223	.074	.145	3.007	.003
ORDCOMP order interacted with ecompare	387.871	235.220	.050	1.649	.100
TACRES1	352.758	179.058	.082	1.970	.050
NSOLD number of ctp sold	1250.989	535.145	.103	2.338	.020
NSOLD1	-2151.921	884.972	-.108	-2.432	.016
NSOLD3	1498.252	820.180	.096	1.827	.069
FERTYES Used fertilizer	4495.063	2780.637	.054	1.617	.107
FERTYES3	-6598.913	3301.621	-.108	-1.999	.047

a Dependent Variable: VRETCTP

B. Sold Cereals and Tubers, Conditional Models

Per Capita Income Quintile 1

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.911(a)	.829	.818	3382.50221	

a Predictors: (Constant), WHTSLD, FEMHEAD3, NSOLD1, RICESLD, NCTPQSLD, ORDCOMP3, DMGQSLD, NDAMAGE3, NSLDQSLD, QKEYSWH qkeysold interacted with wheat, QKEYSOLD quant of prodn of key sales crop based on value sold approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	318.264	358.815		.887	.376
NCTPQSLD	-.478	.105	-.350	-4.551	.000
NSOLD1	702.552	387.915	.065	1.811	.072
NSLDQSLD	2.800	.260	.699	10.767	.000
ORDCOMP3	246.810	130.865	.109	1.886	.061
FEMHEAD3	2349.659	1692.940	.055	1.388	.167
NDAMAGE3	-454.462	327.410	-.076	-1.388	.167
DMGQSLD	-.232	.144	-.086	-1.617	.108
QKEYSOLD quant of prodn of key sales crop based on value sold approach	3.519	.954	.362	3.689	.000
QKEYSWH qkeysold interacted with wheat	11.913	2.106	.417	5.657	.000
RICESLD	7974.002	1290.590	.238	6.179	.000
WHTSLD	-5126.719	2887.690	-.129	-1.775	.078

a Dependent Variable: VSOLDCTP

Sold Cereals and Tubers, Conditional Models

Per Capita Income Quintile 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.912(a)	.832	.824	5503.70591	

a Predictors: (Constant), QKEYSRI qkeysold interacted with rice, QKEYSWH qkeysold interacted with wheat, PRODYEAR Farmer's view about production year 1999/2000, NSOLD number of ctp sold, NCTPQSLD, LBRQSLD, NSLDQSLD, QKEYSOLD quant of prodn of key sales crop based on value sold approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-1709.209	1065.173		-1.605	.111
NCTPQSLD	-.155	.077	-.114	-2.003	.047
NSOLD number of ctp sold	585.981	333.982	.087	1.755	.081
NSLDQSLD	1.238	.226	.414	5.487	.000
PRODYEAR Farmer's view about production year 1999/2000	2.304	1.429	.052	1.612	.109
LBRQSLD	-1.340	.639	-.155	-2.098	.037
QKEYSOLD quant of prodn of key sales crop based on value sold approach	5.477	.908	.596	6.030	.000
QKEYSWH qkeysold interacted with wheat	5.337	.760	.242	7.026	.000
QKEYSRI qkeysold interacted with rice	8.022	1.013	.275	7.920	.000

a Dependent Variable: VSOLDCTP

Sold Cereals and Tubers, Conditional Models

Per Capita Income Quintile 3

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.954(a)	.910	.905	6874.22468	

a Predictors: (Constant), QKEYSSTP qkeysold interacted with sweetpotatoes, NCTPQSLD, QKEYSMI qkeysold interacted with millet, QKEYSCA qkeysold interacted with cassava, QKEYSWH qkeysold interacted with wheat, DMGQSLD, QKEYSOLD quant of prodn of key sales crop based on value sold approach, NSLDQSLD

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	325.463	708.620		.459	.647
NCTPQSLD	-.296	.120	-.182	-2.464	.015
NSLDQSLD	.998	.166	.300	6.023	.000
DMGQSLD	.213	.109	.074	1.954	.052
QKEYSOLD quant of prodn of key sales crop based on value sold approach	6.419	.446	.693	14.407	.000
QKEYSWH qkeysold interacted with wheat	4.847	.530	.255	9.141	.000
QKEYSMI qkeysold interacted with millet	14.106	3.078	.109	4.583	.000
QKEYSCA qkeysold interacted with cassava	-4.790	1.458	-.088	-3.286	.001
QKEYSSTP qkeysold interacted with sweetpotatoes	-3.790	1.120	-.080	-3.384	.001

a Dependent Variable: VSOLDCTP

Sold Cereals and Tubers, Conditional Models

Per Capita Income Quintile 4

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.886(a)	.786	.774	13237.31784	

a Predictors: (Constant), QKEYSGNT qkeysold interacted with groundnuts, QKEYSWH qkeysold interacted with wheat, LBRQSLD, FERTYES Used fertilizer, NSOLD number of ctp sold, ORDCOMP3, TACRES total acres cultivated, FERTQSLD, QKEYSOLD quant of prodn of key sales crop based on value sold approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-889.414	3097.167		-.287	.774
NSOLD number of ctp sold	2666.759	612.548	.173	4.354	.000
ORDCOMP3	384.549	185.127	.090	2.077	.039
TACRES total acres cultivated	377.436	168.906	.096	2.235	.027
FERTYES Used fertilizer	-9584.873	3141.288	-.132	-3.051	.003
FERTQSLD	7.456	.847	.710	8.803	.000
LBRQSLD	2.540	.880	.269	2.888	.004
QKEYSOLD quant of prodn of key sales crop based on value sold approach	-1.922	1.134	-.199	-1.695	.092
QKEYSWH qkeysold interacted with wheat	5.476	1.345	.158	4.071	.000
QKEYSGNT qkeysold interacted with groundnuts	50.184	14.829	.129	3.384	.001

a Dependent Variable: VSOLDCTP

Sold Cereals and Tubers, Conditional Models

Per Capita Income Quintile 5

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.957(a)	.916	.911	25278.51185	

a Predictors: (Constant), BNSSLD, SCH_HEAD years of schooling for hh head, QKEYSWH qkeysold interacted with wheat, QKEYSIP qkeysold interacted with irish potatoes, ORDCOMP order interacted with ecompare, PVASST02 Unstandardized Predicted Value, FERTQSLD, NSLDQSLD, NCTPQSLD, QKEYSOLD quant of prodn of key sales crop based on value sold approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-8554.964	8158.553		-1.049	.296
NCTPQSLD	-.301	.163	-.159	-1.850	.066
NSLDQSLD	1.908	.214	.660	8.923	.000
ORDCOMP order interacted with ecompare	1084.746	577.025	.046	1.880	.062
SCH_HEAD years of schooling for hh head	-876.680	421.371	-.051	-2.081	.039
PVASST02 Unstandardized Predicted Value	.010	.007	.036	1.340	.182
FERTQSLD	-2.875	1.250	-.226	-2.301	.023
QKEYSOLD quant of prodn of key sales crop based on value sold approach	7.194	1.626	.565	4.423	.000
QKEYSWH qkeysold interacted with wheat	5.736	.701	.227	8.187	.000
QKEYSIP qkeysold interacted with irish potatoes	-2.637	.949	-.084	-2.779	.006
BNSSLD	11343.470	7490.660	.036	1.514	.132

a Dependent Variable: VSOLDCTP

C. Retained f&v, Conditional Models

Per Capita Income Quintile 1

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.704(a)	.496	.450	4070.45399	

a Predictors: (Constant), CPLVSRET, QKEYRTO qkeyret interacted w/ tomato, QKEYROR qkeyret interacted w/ orange, QKEYRCC qkeyret interacted w/ coconut, ZEROQRET nzerohrv interacted w/ qkeyret, QKEYRMG qkeyret interacted w/ mango, SUKRET, NFV3, AVOCRET, NADULT # of adults in hh, PRODYEAR Farmer's view about production year 1999/2000, NDAMAGE1, FERTYES3, ORNGRET, NADULT2, NZERO1, COCORET, NSLDQRET nsold interacted w/ qkeyret, NFV1, NADULT3, NFVQRET nfv interacted w/ qkeyret, QKEYRET quant of prodn of key retained crop based on quantity retained approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	595.810	691.944		.861	.390
NFV1	404.104	166.192	.248	2.432	.016
NFV3	724.563	208.082	.275	3.482	.001
NFVQRET nfv interacted w/ qkeyret	.462	.162	.554	2.847	.005
NSLDQRET nsold interacted w/ qkeyret	-.464	.136	-.343	-3.405	.001
NADULT # of adults in hh	726.454	131.278	.383	5.534	.000
NADULT2	-524.020	139.852	-.294	-3.747	.000
NADULT3	-807.254	186.439	-.452	-4.330	.000
NDAMAGE1	-970.161	239.074	-.334	-4.058	.000
NZERO1	285.508	126.676	.154	2.254	.025
ZEROQRET nzerohrv interacted w/ qkeyret	-.368	.069	-.552	-5.370	.000
PRODYEAR Farmer's view about production year 1999/2000	1.363	.995	.088	1.370	.172
FERTYES3	-2384.583	1030.795	-.144	-2.313	.022
QKEYRET quant of prodn of key retained crop based on quantity retained approach	4.359	1.307	.659	3.335	.001
QKEYROR qkeyret interacted w/ orange	5.951	2.724	.141	2.184	.030
QKEYRTO qkeyret interacted w/ tomato	-3.713	2.010	-.095	-1.847	.066
QKEYRMG qkeyret interacted w/ mango	-3.987	.893	-.505	-4.465	.000
QKEYRCC qkeyret interacted w/ coconut	-5.724	1.569	-.292	-3.648	.000
AVOCRET	-1325.081	967.230	-.068	-1.370	.172
COCORET	-2996.455	2197.490	-.099	-1.364	.174
SUKRET	-1858.316	959.961	-.092	-1.936	.054
ORNGRET	-2804.159	1788.799	-.098	-1.568	.118
CPLVSRET	-1879.470	976.321	-.093	-1.925	.055

a Dependent Variable: VRETFV

Retained f&v, Conditional Models

Per Capita Income Quintile 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.623(a)	.388	.346	5099.85909	

a Predictors: (Constant), GUAVARET, HLBRYES used hired labour, FEMHEAD3, QKEYRMG qkeyret interacted w/ mango, QKEYROR qkeyret interacted w/ orange, QKEYRCB qkeyret interacted w/ cabbage, PVASSET2, TACRES total cropped acres, NSOLD number of f&v sold, NDAMAGE number of f&v damaged, FERTYES3, TACRES1, NFV number of f&v produced, HLBRYES3, TACRES3, QKEYRGV qkeyret interacted w/ guava, QKEYRET quant of prodn of key retained crop based on quantity retained approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	43.653	845.317		.052	.959
NFV number of f&v produced	821.222	123.125	.422	6.670	.000
NSOLD number of f&v sold	-358.080	199.329	-.108	-1.796	.074
PVASSET2	-.008	.006	-.070	-1.290	.198
FEMHEAD3	3380.616	1526.996	.116	2.214	.028
TACRES total cropped acres	163.347	87.889	.141	1.859	.064
TACRES1	-337.760	127.113	-.174	-2.657	.008
TACRES3	-240.567	121.826	-.157	-1.975	.049
NDAMAGE number of f&v damaged	-227.978	145.000	-.089	-1.572	.117
FERTYES3	-1682.920	921.728	-.109	-1.826	.069
HLBRYES used hired labour	-4011.191	1734.334	-.147	-2.313	.022
HLBRYES3	10079.743	3139.546	.218	3.211	.002
QKEYRET quant of prodn of key retained crop based on quantity retained approach	3.553	.625	.599	5.689	.000
QKEYRGV qkeyret interacted w/ guava	5.912	5.302	.097	1.115	.266
QKEYRMG qkeyret interacted w/ mango	-1.877	.673	-.287	-2.790	.006
QKEYROR qkeyret interacted w/ orange	-2.751	1.615	-.090	-1.704	.090
QKEYRCB qkeyret interacted w/ cabbage	-3.891	2.395	-.088	-1.624	.106
GUAVARET	-3386.567	2436.592	-.120	-1.390	.166

a Dependent Variable: VRETFV

Retained f&v, Conditional Models

Per Capita Income Quintile 3

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.692(a)	.479	.440	7106.16639	

a Predictors: (Constant), COCORET, NZERO1, QKEYRTO qkeyret interacted w/ tomato, QKEYRMG qkeyret interacted w/ mango, QKEYRCB qkeyret interacted w/ cabbage, PAPARET, NDAMAGE2, AVOCRET, FERTYES3, SUKRET, NFV number of f&v produced, LBRQRET hlbryes interacted w/ qkeyret, NDAMAGE1, PRODYR2, NZEROHRV, QKEYRET quant of prodn of key retained crop based on quantity retained approach, TACRES2, NFV2

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	1488.035	1241.817		1.198	.232
NFV number of f&v produced	729.113	135.335	.308	5.387	.000
NFV2	940.804	382.681	.265	2.458	.015
TACRES2	515.502	245.997	.175	2.096	.037
NDAMAGE1	-297.175	215.024	-.084	-1.382	.168
NDAMAGE2	-1333.984	452.786	-.193	-2.946	.004
NZEROHRV	-268.949	159.151	-.102	-1.690	.092
NZERO1	370.653	251.449	.094	1.474	.142
PRODYR2	-2661.496	983.947	-.252	-2.705	.007
FERTYES3	-2918.801	1220.145	-.120	-2.392	.018
LBRQRET hlbryes interacted w/ qkeyret	1.924	1.217	.087	1.582	.115
QKEYRET quant of prodn of key retained crop based on quantity retained approach	4.257	.455	.721	9.356	.000
QKEYRMG qkeyret interacted w/ mango	-3.545	.565	-.476	-6.278	.000
QKEYRCB qkeyret interacted w/ cabbage	-7.162	1.459	-.260	-4.908	.000
QKEYRTO qkeyret interacted w/ tomato	-5.478	3.387	-.080	-1.617	.107
AVOCRET	-2239.439	1326.861	-.087	-1.688	.093
PAPARET	-4553.089	2283.584	-.096	-1.994	.047
SUKRET	-3201.077	1323.157	-.121	-2.419	.016
COCORET	-6958.581	3122.404	-.118	-2.229	.027

a Dependent Variable: VRETFV

Retained f&v, Conditional Models

Per Capita Income Quintile 4

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.780(a)	.609	.575	9525.45208	

a Predictors: (Constant), INDIGRET, FEMHEAD female headed hh, NSLDQRET nsold interacted w/ qkeyret, NZERO3, QKEYRTO qkeyret interacted w/ tomato, QKEYRSU qkeyret interacted w/ sukuma, QKEYRCB qkeyret interacted w/ cabbage, QKEYRMG qkeyret interacted w/ mango, NSOLD2, HLBRYES1, NDAMAGE1, PVASSET2, NSOLD3, QKEYRIV qkeyret interacted w/ indigveg, ZEROQRET nzerohrv interacted w/ qkeyret, NSOLD number of f&v sold, ORDCOMP1, NADULT2, NSOLD1, QKEYRAV qkeyret interacted w/ avocado, QKEYRET quant of prodn of key retained crop based on quantity retained approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	540.867	1029.681		.525	.600
NSOLD number of f&v sold	1533.186	281.207	.348	5.452	.000
NSOLD1	2368.357	600.629	.334	3.943	.000
NSOLD2	-1456.871	507.690	-.163	-2.870	.004
NSOLD3	-1037.708	367.781	-.149	-2.822	.005
NSLDQRET nsold interacted w/ qkeyret	-.353	.078	-.564	-4.529	.000
NADULT2	880.556	337.865	.165	2.606	.010
PVASSET2	-.018	.011	-.084	-1.571	.117
ORDCOMP1	-374.309	226.134	-.111	-1.655	.099
FEMHEAD female headed hh	5450.096	1833.029	.122	2.973	.003
NDAMAGE1	594.896	402.631	.088	1.478	.141
NZERO3	509.234	297.429	.076	1.712	.088
ZEROQRET nzerohrv interacted w/ qkeyret	-.337	.163	-.109	-2.065	.040
HLBRYES1	-11993.027	4771.943	-.132	-2.513	.013
QKEYRET quant of prodn of key retained crop based on quantity retained approach	10.316	.879	2.255	11.729	.000
QKEYRMG qkeyret interacted w/ mango	-6.806	1.640	-.184	-4.149	.000
QKEYRAV qkeyret interacted w/ avocado	-7.341	.739	-1.553	-9.936	.000
QKEYRCB qkeyret interacted w/ cabbage	-7.656	1.476	-.240	-5.186	.000
QKEYRTO qkeyret interacted w/ tomato	-7.560	2.015	-.164	-3.752	.000
QKEYRSU qkeyret interacted w/ sukuma	-7.432	1.614	-.205	-4.604	.000
QKEYRIV qkeyret interacted w/ indigveg	6.976	3.018	.118	2.312	.022
INDIGRET	-6090.858	4371.731	-.071	-1.393	.165

a Dependent Variable: VRETFV

Retained f&v, Conditional Models

Per Capita Income Quintile 5

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.849(a)	.721	.699	9591.50849	

a Predictors: (Constant), COCORET, FEMHEAD2, FEMHEAD1, QKEYRPU qkeyret interacted w/ pumpkin, QKEYRCB qkeyret interacted w/ cabbage, FERTYES3, SCH_HEAD years of schooling for hh head, FERTQRET fertyes interacted w/ qkeyret, HLBRYES used hired labour, FERTYES1, NFV number of f&v produced, PVASSET1, HLBRYES3, QKEYRCC qkeyret interacted w/ coconut, NDAMAGE1, NFVQRET nfv interacted w/ qkeyret, PRODYR1, ORDCOMP1, QKEYRET quant of prodn of key retained crop based on quantity retained approach

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-1916.317	1743.486		-1.099	.273
NFV number of f&v produced	1186.232	176.170	.288	6.733	.000
NFVQRET nfv interacted w/ qkeyret	-.272	.058	-1.218	-4.712	.000
ORDCOMP1	1659.112	392.149	.394	4.231	.000
SCH_HEAD years of schooling for hh head	-202.865	128.153	-.056	-1.583	.115
PVASSET1	-.021	.007	-.162	-3.076	.002
FEMHEAD1	-9431.980	5638.286	-.066	-1.673	.096
FEMHEAD2	64929.207	9637.891	.228	6.737	.000
NDAMAGE1	793.620	413.210	.106	1.921	.056
PRODYR1	-10669.497	2092.989	-.454	-5.098	.000
FERTYES1	10327.453	4185.811	.137	2.467	.014
FERTYES3	-3316.955	1525.688	-.082	-2.174	.031
FERTQRET fertyes interacted w/ qkeyret	-2.449	.502	-.430	-4.876	.000
HLBRYES used hired labour	-2945.468	2039.397	-.062	-1.444	.150
HLBRYES3	9710.898	4143.428	.101	2.344	.020
QKEYRET quant of prodn of key retained crop based on quantity retained approach	7.789	1.077	2.120	7.229	.000
QKEYRCC qkeyret interacted w/ coconut	-3.082	.383	-.488	-8.046	.000
QKEYRCB qkeyret interacted w/ cabbage	-2.420	.584	-.160	-4.144	.000
QKEYRPU qkeyret interacted w/ pumpkin	3.941	1.326	.107	2.971	.003
COCORET	50715.778	9212.771	.307	5.505	.000

a Dependent Variable: VRETFV

D. Sold f&v, Conditional Models

Per Capita Income Quintile 1

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.621(a)	.386	.351	4980.53571	

a Predictors: (Constant), QKEYSOLD quant of prodn of key sales crop based on value sold approach, NDAMAGE3, FERTYES Used fertilizer, 1 yes, 0 no, ORDCOMP order interacted with ecompare, SCH_HEAD years of schooling for hh head, NSOLD number of f&v sold, TACRES2, PVASST02 Unstandardized Predicted Value, TACRES3, NSOLD2, NFVQSLD nfv interacted w/ qkeysold

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-2838.255	1052.179		-2.698	.008
NSOLD number of f&v sold	2003.361	316.634	.516	6.327	.000
NSOLD2	-1271.768	366.303	-.347	-3.472	.001
NFVQSLD nfv interacted w/ qkeysold	-.215	.120	-.253	-1.793	.075
ORDCOMP order interacted with ecompare	188.717	109.392	.108	1.725	.086
SCH_HEAD years of schooling for hh head	-190.739	103.447	-.111	-1.844	.067
PVASST02 Unstandardized Predicted Value	-.013	.005	-.185	-2.786	.006
TACRES2	867.497	272.474	.253	3.184	.002
TACRES3	-836.717	318.339	-.198	-2.628	.009
NDAMAGE3	1609.482	352.917	.340	4.561	.000
FERTYES Used fertilizer, 1 yes, 0 no	1820.711	852.420	.144	2.136	.034
QKEYSOLD quant of prodn of key sales crop based on value sold approach	3.481	.948	.516	3.674	.000

a Dependent Variable: VSOLDFV

Sold f&v, Conditional Models

Per Capita Income Quintile 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.781(a)	.609	.589	3684.05747	

a Predictors: (Constant), QKEYSSU qkeysold interacted w/ sukuma, PVASSET3, QKEYSAV qkeysold interacted w/ avocado, NSOLD number of f&v sold, QKEYSOLD quant of prodn of key sales crop based on value sold approach, NSOLD2, FERTYES Used fertilizer, 1 yes, 0 no, LBRQSLD hlbryes interacted w/ qkeysold, NFV1, FERTQSLD fertyes interacted w/ qkeysold

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	973.929	591.888		1.645	.101
NFV1	-212.437	80.291	-.159	-2.646	.009
NSOLD number of f&v sold	1111.502	161.853	.370	6.867	.000
NSOLD2	-565.841	228.207	-.139	-2.480	.014
PVASSET3	-.017	.005	-.188	-3.789	.000
FERTYES Used fertilizer, 1 yes, 0 no	-926.470	678.582	-.081	-1.365	.174
FERTQSLD fertyes interacted w/ qkeysold	6.028	.845	.716	7.131	.000
LBRQSLD hlbryes interacted w/ qkeysold	-2.441	.814	-.227	-2.998	.003
QKEYSOLD quant of prodn of key sales crop based on value sold approach	1.366	.278	.277	4.916	.000
QKEYSAV qkeysold interacted w/ avocado	-6.026	1.009	-.347	-5.974	.000
QKEYSSU qkeysold interacted w/ sukuma	-3.615	1.004	-.173	-3.599	.000

a Dependent Variable: VSOLDFV

Sold f&v, Conditional Models

Per Capita Income Quintile 3

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.663(a)	.440	.403	14200.10964	

a Predictors: (Constant), TOMSLD, NSOLD number of f&v sold, PVASST02 Unstandardized Predicted Value, SCH_HEAD years of schooling for hh head, FERTYES2, QKEYSOLD quant of prodn of key sales crop based on value sold approach, HLBRYES1, CBBGSLD, NSOLD3, DMGQSLD ndamage interacted w/ qkeysold, QKEYSCB qkeysold interacted w/ cabbage, NSLDQSLD nsold interacted w/ qkeysold, NFVQSLD nfv interacted w/ qkeysold

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-3232.389	2788.216		-1.159	.248
NFVQSLD nfv interacted w/ qkeysold	-.984	.318	-.535	-3.092	.002
NSOLD number of f&v sold	2211.433	548.861	.298	4.029	.000
NSOLD3	-1284.405	588.876	-.130	-2.181	.030
NSLDQSLD nsold interacted w/ qkeysold	2.373	.525	.663	4.519	.000
SCH_HEAD years of schooling for hh head	346.596	264.490	.075	1.310	.192
PVASST02 Unstandardized Predicted Value	.010	.007	.085	1.537	.126
DMGQSLD ndamage interacted w/ qkeysold	-.699	.318	-.187	-2.196	.029
FERTYES2	-4856.936	3475.598	-.080	-1.397	.164
HLBRYES1	-9080.265	5678.220	-.101	-1.599	.111
QKEYSOLD quant of prodn of key sales crop based on value sold approach	7.930	3.017	.411	2.628	.009
QKEYSCB qkeysold interacted w/ cabbage	6.037	3.866	.162	1.562	.120
CBBGSLD	-11988.708	6181.429	-.188	-1.939	.054
TOMSLD	-5571.376	3584.022	-.085	-1.555	.122

a Dependent Variable: VSOLDFV

Sold f&v, Conditional Models

Per Capita Income Quintile 4

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.725(a)	.525	.501	21228.13497	

a Predictors: (Constant), QKEYSSU qkeysold interacted w/ sukuma, QKEYSOLD quant of prodn of key sales crop based on value sold approach, PRODYR3, ORDCOMP1, NSOLD number of f&v sold, PRODYEAR Farmer's view about production year 1999/2000, DMGQSLD ndamage interacted w/ qkeysold, QKEYSAV qkeysold interacted w/ avocado, NFVQSLD nfv interacted w/ qkeysold, NSLDQSLD nsold interacted w/ qkeysold

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-1607.839	3019.027		-.533	.595
NFVQSLD nfv interacted w/ qkeysold	-.338	.159	-.665	-2.124	.035
NSOLD number of f&v sold	2218.318	621.387	.243	3.570	.000
NSLDQSLD nsold interacted w/ qkeysold	1.168	.376	.996	3.109	.002
ORDCOMP1	774.348	367.767	.110	2.106	.037
DMGQSLD ndamage interacted w/ qkeysold	-.830	.241	-.269	-3.448	.001
PRODYEAR Farmer's view about production year 1999/2000	7.486	5.132	.085	1.459	.146
PRODYR3	-12.881	8.639	-.085	-1.491	.138
QKEYSOLD quant of prodn of key sales crop based on value sold approach	6.498	1.861	.758	3.491	.001
QKEYSAV qkeysold interacted w/ avocado	-5.214	1.485	-.552	-3.511	.001
QKEYSSU qkeysold interacted w/ sukuma	-7.904	4.539	-.087	-1.741	.083

a Dependent Variable: VSOLDFV

Sold f&v, Conditional Models

Per Capita Income Quintile 5

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.925(a)	.855	.838	18170.76855	

a Predictors: (Constant), CBBGSLD, SCHHEAD2, DMGQSLD ndamage interacted w/ qkeysold, QKEYSAV qkeysold interacted w/ avocado, PVASSET1, FEMHEAD2, NDAMAGE3, LBRAREA, SCHHEAD3, NSOLD number of f&v sold, NDAMAGE2, FERTQSLD fertyes interacted w/ qkeysold, NDAMAGE1, HLBRYES2, ORDCOMP1, QKEYSOLD quant of prodn of key sales crop based on value sold approach, NADULT1, LBRQSLD hlbryes interacted w/ qkeysold, PRODYR1, ZEROQSLD nzerohrv interacted w/ qkeysold, NFV1, NSLDQSLD nsold interacted w/ qkeysold

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	1264.442	2894.416		.437	.663
NFV1	2347.013	1136.292	.229	2.066	.040
NSOLD number of f&v sold	997.080	559.883	.070	1.781	.077
NSLDQSLD nsold interacted w/ qkeysold	1.062	.171	.798	6.216	.000
ORDCOMP1	1985.928	808.075	.201	2.458	.015
NADULT1	-2796.764	1608.472	-.122	-1.739	.084
PVASSET1	.017	.012	.055	1.339	.182
FEMHEAD2	52242.271	18743.638	.080	2.787	.006
NDAMAGE3	1934.764	652.374	.093	2.966	.003
DMGQSLD ndamage interacted w/ qkeysold	-.290	.112	-.273	-2.593	.010
ZEROQSLD nzerohrv interacted w/ qkeysold	-1.134	.201	-.415	-5.656	.000
SCHHEAD3	-639.995	297.949	-.068	-2.148	.033
FERTQSLD fertyes interacted w/ qkeysold	-1.944	.766	-.145	-2.538	.012
PRODYR1	-15587.381	4183.231	-.280	-3.726	.000
LBRQSLD hlbryes interacted w/ qkeysold	1.859	.870	.167	2.138	.034
HLBRYES2	-53734.692	13526.444	-.143	-3.973	.000
LBRAREA	2802.888	436.248	.252	6.425	.000
SCHHEAD2	1627.225	662.874	.090	2.455	.015
NDAMAGE1	-1413.061	1097.114	-.078	-1.288	.199
NDAMAGE2	-5155.265	3316.986	-.050	-1.554	.122
QKEYSAV qkeysold interacted w/ avocado	-2.822	.978	-.093	-2.885	.004
QKEYSOLD quant of prodn of key sales crop based on value sold approach	2.687	.611	.313	4.398	.000
CBBGSLD	-5364.265	3671.720	-.047	-1.461	.146

a Dependent Variable: VSOLDFV

E. Industrial Crops,, Conditional Models

Per Capita Income Quintile 1

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.961(a)	.924	.916	3772.24570	

a Predictors: (Constant), QKEYVPY, SCH_HEAD years of schooling for hh head, HLBRYES3, QKEYV quant of key crop based on value approach, QKEYVCF, NSOLD Number of industrial crops sold, HLBRYES2, QKEYVTE, SCHHEAD3, SCHHEAD2, NADULT3

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-5056.415	1216.645		-4.156	.000
NSOLD Number of industrial crops sold	4514.413	810.192	.175	5.572	.000
NADULT3	-487.925	302.750	-.087	-1.612	.110
SCH_HEAD years of schooling for hh head	-433.973	129.898	-.110	-3.341	.001
SCHHEAD2	611.629	191.031	.127	3.202	.002
SCHHEAD3	844.811	335.461	.131	2.518	.013
HLBRYES2	-3365.162	1431.605	-.083	-2.351	.021
HLBRYES3	-7896.461	2676.462	-.109	-2.950	.004
QKEYV quant of key crop based on value approach	1.642	.064	.963	25.761	.000
QKEYVTE	17.226	1.126	.569	15.301	.000
QKEYVCF	18.827	1.594	.366	11.808	.000
QKEYVPY	99.643	26.477	.124	3.763	.000

a Dependent Variable: VSOLDIND

Industrial Crops,, Conditional Models

Per Capita Income Quintile 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.975(a)	.952	.947	6469.74731	

a Predictors: (Constant), QKEYVPY, HLBRYES3, TACRES2, QKEYVTE, NSOLD Number of industrial crops sold, PRODYEAR Farmer's view about production year 1999/2000, QKEYVCF, HLBRYES used hired labour, QKEYV quant of key crop based on value approach, LBRAREA hlbryes interacted with acres

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-2831.793	1876.953		-1.509	.134
NSOLD Number of industrial crops sold	2818.078	1120.569	.059	2.515	.013
TACRES2	891.629	387.936	.091	2.298	.023
PRODYEAR Farmer's view about production year 1999/2000	-3.518	1.679	-.050	-2.095	.038
HLBRYES used hired labour	5175.913	1581.608	.091	3.273	.001
HLBRYES3	-10259.467	3593.692	-.073	-2.855	.005
LBRAREA hlbryes interacted with acres	-1337.385	270.209	-.176	-4.949	.000
QKEYV quant of key crop based on value approach	1.509	.062	.753	24.145	.000
QKEYVTE	17.364	.531	.747	32.696	.000
QKEYVCF	16.715	1.194	.341	14.004	.000
QKEYVPY	88.803	27.804	.070	3.194	.002

a Dependent Variable: VSOLDIND

Industrial Crops,, Conditional Models

Per Capita Income Quintile 3

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.981(a)	.962	.959	8332.12558	

a Predictors: (Constant), COFFEE, FEMHEAD female headed hh, QKEYVPY, FERTYES3, LBRAREA hlbryes interacted with acres, NSOLD Number of industrial crops sold, SCH_HEAD years of schooling for hh head, QKEYV quant of key crop based on value approach, QKEYVCF, QKEYVTE, FEMHEAD2

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-1316.022	3088.520		-.426	.671
NSOLD Number of industrial crops sold	4770.199	1349.857	.077	3.534	.001
SCH_HEAD years of schooling for hh head	-372.527	198.115	-.038	-1.880	.063
FEMHEAD female headed hh	-9990.785	3329.311	-.081	-3.001	.003
FEMHEAD2	11160.806	4811.028	.064	2.320	.022
FERTYES3	-6450.220	3619.936	-.042	-1.782	.078
LBRAREA hlbryes interacted with acres	-522.916	221.104	-.048	-2.365	.020
QKEYV quant of key crop based on value approach	1.634	.041	1.024	40.315	.000
QKEYVTE	14.884	.732	.517	20.322	.000
QKEYVCF	27.908	1.609	.421	17.349	.000
QKEYVPY	59.430	20.720	.056	2.868	.005
COFFEE	-5002.215	2449.220	-.057	-2.042	.044

a Dependent Variable: VSOLDIND

Industrial Crops,, Conditional Models

Per Capita Income Quintile 4

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.987(a)	.974	.971	10825.31958	

a Predictors: (Constant), COFFEE, PVASST02 Unstandardized Predicted Value, QKEYVPY, PRODYR3, NDAMAGE Number of industrial crops damaged, HLBRYES used hired labour, NSOLD Number of industrial crops sold, QKEYVSG, PRODYEAR Farmer's view about production year 1999/2000, NADULT3, QKEYVCF, QKEYVTE, TACRES3

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	6719.682	3727.294		1.803	.074
NSOLD Number of industrial crops sold	5856.676	1878.921	.061	3.117	.002
NADULT3	-6677.084	1251.593	-.219	-5.335	.000
PVASST02 Unstandardized Predicted Value	-.047	.009	-.100	-5.442	.000
TACRES3	2794.251	997.860	.113	2.800	.006
NDAMAGE Number of industrial crops damaged	2653.490	1273.979	.038	2.083	.040
PRODYEAR Farmer's view about production year 1999/2000	-7.441	3.476	-.040	-2.141	.035
PRODYR3	-11.061	7.849	-.028	-1.409	.162
HLBRYES used hired labour	-7251.995	2436.541	-.057	-2.976	.004
QKEYVTE	18.880	.560	.859	33.731	.000
QKEYVCF	41.265	1.586	.578	26.018	.000
QKEYVPY	93.140	22.759	.078	4.092	.000
QKEYVSG	1.579	.038	.831	41.556	.000
COFFEE	-17237.243	3270.494	-.132	-5.271	.000

a Dependent Variable: VSOLDIND

Industrial Crops,, Conditional Models

Per Capita Income Quintile 5

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.981(a)	.963	.961	30061.53884	

a Predictors: (Constant), QKEYVSG, HLBRYES3, QKEYVCF, NDAMAGE Number of industrial crops damaged, QKEYVTE, NSOLD Number of industrial crops sold

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-15819.849	7789.344		-2.031	.045
NSOLD Number of industrial crops sold	22806.729	4643.151	.117	4.912	.000
HLBRYES3	-44418.011	11880.338	-.078	-3.739	.000
NDAMAGE Number of industrial crops damaged	-9221.613	3462.540	-.058	-2.663	.009
QKEYVTE	18.350	.400	.941	45.830	.000
QKEYVCF	20.917	1.256	.336	16.648	.000
QKEYVSG	1.565	.051	.593	30.412	.000

a Dependent Variable: VSOLDIND

F. Livestock, Conditional Models

Per Capita Income Quintile 1

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.752(a)	.566	.538	10752.97770	

a Predictors: (Constant), INT_LCOW, NCBULL, FEMHEAD female headed hh, PVASST02 Unstandardized Predicted Value, NSOLD_LV, SCHHEAD2, SOLDEGG, SOLDCBUL, NCCOW, NLCOW, INT_CHIC, NADULT2, NSOLD_LP, INT_CCOW

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	2536.948	1285.551		1.973	.050
NADULT2	369.362	311.439	.071	1.186	.237
SCHHEAD2	-732.158	289.997	-.141	-2.525	.012
PVASST02 Unstandardized Predicted Value	.017	.008	.091	1.985	.048
FEMHEAD female headed hh	-3103.275	1834.782	-.081	-1.691	.092
NSOLD_LP	7481.220	1780.279	.310	4.202	.000
NSOLD_LV	6812.023	1186.609	.281	5.741	.000
NCBULL	-10497.346	2751.192	-.202	-3.816	.000
NLCOW	1823.542	337.652	.284	5.401	.000
NCCOW	1654.251	919.257	.146	1.800	.073
SOLDCBUL	10788.129	4932.818	.108	2.187	.030
SOLDEGG	-12728.094	3229.263	-.300	-3.941	.000
INT_CCOW	4035.854	1154.473	.307	3.496	.001
INT_CHIC	860.707	205.981	.245	4.179	.000
INT_LCOW	-1027.973	674.158	-.088	-1.525	.129

a Dependent Variable: VNET_LV Net value livestock income

Livestock, Conditional Models

Per Capita Income Quintile 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.711(a)	.506	.484	23923.76314	

a Predictors: (Constant), INT_CHIC, NSOLD_LV, INT_GCOW, ORDCOMP order interacted with ecompare, NPROD_LP, INT_CCOW, SOLDMK, SCCOW3, NGCALF, NSOLD_LP

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-6952.250	5286.945		-1.315	.190
ORDCOMP order interacted with ecompare	874.219	364.354	.119	2.399	.017
NPROD_LP	4965.036	3032.608	.090	1.637	.103
NSOLD_LP	-4785.752	4017.785	-.102	-1.191	.235
NSOLD_LV	5008.167	1980.080	.137	2.529	.012
NGCALF	10976.187	3875.738	.205	2.832	.005
SCCOW3	32525.657	7168.606	.267	4.537	.000
SOLDMK	10326.907	5162.643	.155	2.000	.047
INT_GCOW	5661.144	2457.878	.169	2.303	.022
INT_CCOW	4803.523	1266.784	.227	3.792	.000
INT_CHIC	799.611	277.171	.162	2.885	.004

a Dependent Variable: VNET_LV Net value livestock income

Livestock, Conditional Models

Per Capita Income Quintile 3

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.688(a)	.473	.439	23765.04312	

a Predictors: (Constant), INT_GCOW, NCBULL, NSOLD_LV, SCCOW1, NLCALF, NGBULL, ORDCOMP2, NPROD_LP, SOLDCBUL, SCCOW3, INT_CCOW, NPRODLP3, NGCALF, NGCOW

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-991.746	4642.764		-.214	.831
ORDCOMP2	-778.958	450.218	-.092	-1.730	.085
NPROD_LP	6778.670	2591.269	.141	2.616	.010
NPRODLP3	-7177.495	2403.670	-.199	-2.986	.003
NSOLD_LV	3850.780	2051.914	.112	1.877	.062
SOLDCBUL	33705.204	13381.824	.138	2.519	.012
NGCALF	30538.982	4604.005	.467	6.633	.000
NLCALF	5267.392	947.816	.294	5.557	.000
NGBULL	45425.669	12799.888	.186	3.549	.000
NCBULL	6402.490	2721.498	.135	2.353	.020
NGCOW	-10223.280	7166.297	-.373	-1.427	.155
SCCOW3	28596.216	8335.255	.206	3.431	.001
SCCOW1	25424.114	14066.845	.090	1.807	.072
INT_CCOW	3657.230	1440.444	.160	2.539	.012
INT_GCOW	10563.705	7229.230	.382	1.461	.145

a Dependent Variable: VNET_LV Net value livestock income

Livestock, Conditional Models

Per Capita Income Quintile 4

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.684(a)	.468	.436	31279.17231	

a Predictors: (Constant), INT_GCOW, SCBUL2, SGCOW2, INT_CHIC, NLCALF, NSOLD_LV, SCH_HEAD years of schooling for hh head, NCCALF, NADULT # of adults in hh, SCHHEAD2, NSHEEP, SOLDEGG, NGCALF

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-4446.887	6375.741		-.697	.486
NADULT # of adults in hh	1684.730	810.115	.110	2.080	.039
SCH_HEAD years of schooling for hh head	1200.354	488.666	.128	2.456	.015
SCHHEAD2	-2010.631	698.741	-.156	-2.878	.004
NGCALF	13543.950	4131.466	.252	3.278	.001
NCCALF	8031.713	1772.908	.247	4.530	.000
NLCALF	3393.334	1087.780	.180	3.120	.002
NSHEEP	-1172.572	482.072	-.142	-2.432	.016
NSOLD_LV	5560.323	2109.877	.139	2.635	.009
SGCOW2	117690.005	32338.110	.184	3.639	.000
SCBUL2	73594.305	32829.109	.115	2.242	.026
SOLDEGG	-12312.502	7156.791	-.120	-1.720	.087
INT_CHIC	1598.172	327.237	.341	4.884	.000
INT_GCOW	8828.408	2641.618	.251	3.342	.001

a Dependent Variable: VNET_LV Net value livestock income

Livestock, Conditional Models

Per Capita Income Quintile 5

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.917(a)	.841	.831	43653.41115	

a Predictors: (Constant), INT_CCOW, NCHICK, FEMHEAD female headed hh, NLCALF, SGBUL3, NSOLD_LV, SCHHEAD3, INT_GCOW, NSHEEP, NCCALF, SGCOW3, ORDCOMP3, SOLDMK3, NPRODLP3

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-6687.529	4959.748		-1.348	.179
ORDCOMP3	3268.896	975.706	.195	3.350	.001
SCHHEAD3	-3456.407	913.436	-.161	-3.784	.000
FEMHEAD female headed hh	15997.283	9515.445	.047	1.681	.094
NPRODLP3	-18574.029	7716.602	-.179	-2.407	.017
NCHICK	751.004	31.666	.679	23.716	.000
NCCALF	6326.159	1240.151	.192	5.101	.000
NSHEEP	-1652.254	674.187	-.081	-2.451	.015
NLCALF	6221.551	2317.906	.080	2.684	.008
NSOLD_LV	16181.244	2892.993	.171	5.593	.000
SGCOW3	44778.080	16150.054	.115	2.773	.006
SGBUL3	64367.651	25077.813	.088	2.567	.011
SOLDMK3	24627.688	14193.132	.106	1.735	.084
INT_GCOW	16923.498	1920.047	.312	8.814	.000
INT_CCOW	4010.643	1640.543	.099	2.445	.015

a Dependent Variable: VNET_LV Net value livestock income

G. Informal Off-Farm, Conditional Models

Per Capita Income Quintile 1

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.707(a)	.500	.448	15323.68940	

a Predictors: (Constant), MTHCARP, MINE mining business, MTHTOUT, MTHCLOTH, MTHBIKE, MTHBREW, PVASST02 Unstandardized Predicted Value, ORDCOMP2, NMTHS # of months hh had income from informal activities, NPEOPLE3, NADULT1, NPEOPLE2, PVASSET2, TOUT Tout, CLOTHES clothes business

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-11885.108	4217.677		-2.818	.006
NMTHS # of months hh had income from informal activities	1447.401	363.355	.255	3.983	.000
NPEOPLE2	9090.627	3522.396	.275	2.581	.011
NPEOPLE3	9585.545	1933.357	.341	4.958	.000
NADULT1	2416.567	525.250	.336	4.601	.000
PVASST02 Unstandardized Predicted Value	.056	.034	.122	1.643	.103
PVASSET2	.118	.063	.202	1.863	.064
ORDCOMP2	-1384.592	609.577	-.286	-2.271	.025
MINE mining business	26462.786	11085.274	.143	2.387	.018
TOUT Tout	-167767.462	68326.659	-1.270	-2.455	.015
CLOTHES clothes business	217584.409	71449.188	1.647	3.045	.003
MTHCLOTH	-18625.641	6492.618	-1.561	-2.869	.005
MTHBREW	759.550	433.977	.111	1.750	.082
MTHTOUT	17823.662	6015.718	1.528	2.963	.004
MTHBIKE	823.697	636.063	.079	1.295	.197
MTHCARP	1193.821	638.875	.115	1.869	.064

a Dependent Variable: VINFORM earnings from all informal off-farm activities

Informal Off-Farm, Conditional Models

Per Capita Income Quintile 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.535(a)	.286	.249	37420.23227	

a Predictors: (Constant), MANDAS mandasi cakes, MTHHAWK, POSHO posho mill, ORDCOMP3, NMTHS # of months hh had income from informal activities, NADULT # of adults in hh, MTHTRANS, MTHMAND

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-11520.243	10935.552		-1.053	.294
NMTHS # of months hh had income from informal activities	2687.649	852.214	0.221	3.154	.002
NADULT # of adults in hh	2263.765	1105.671	.148	2.047	.042
ORDCOMP3	1941.445	1021.036	.132	1.901	.059
MTHTRANS	7023.604	3508.347	.153	2.002	.047
MTHMAND	-184175.958	41846.967	-9.568	-4.401	.000
MTHHAWK	-3339.258	2148.704	-.109	-1.554	.122
POSHO posho mill	36418.724	22304.141	.114	1.633	.105
MANDAS mandasi cakes	2221781.518	494069.291	9.749	4.497	.000

a Dependent Variable: VINFORM earnings from all informal off-farm activities

Informal Off-Farm, Conditional Models

Per Capita Income Quintile 3

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.636(a)	.404	.365	36696.46931	

a Predictors: (Constant), JAGG jaggery, MTHHAWK, MTHMASON, NMTHS3, NMTHS # of months hh had income from informal activities, SCHHEAD1, NADULT # of adults in hh, PVASSET2, NPEOPLE1, WAGE2

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-21661.619	11089.290		-1.953	.053
NADULT # of adults in hh	3649.858	1151.224	.220	3.170	.002
SCHHEAD1	-3692.826	1129.675	-.259	-3.269	.001
PVASSET2	.255	.082	.300	3.120	.002
NMTHS # of months hh had income from informal activities	2347.523	949.380	.179	2.473	.015
NMTHS3	1196.619	836.728	.114	1.430	.155
NPEOPLE1	16519.782	4089.928	.349	4.039	.000
WAGE2	-434.131	192.126	-.248	-2.260	.025
MTHHAWK	8294.315	1862.991	.297	4.452	.000
MTHMASON	2170.847	1008.057	.145	2.153	.033
JAGG jaggery	94031.918	38759.530	.160	2.426	.016

a Dependent Variable: VINFORM earnings from all informal off-farm activities

Informal Off-Farm, Conditional Models

Per Capita Income Quintile 4

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.613(a)	.376	.343	62766.88319	

a Predictors: (Constant), MTHTIMB, MINE mining business, FEMHEAD3, SCHHEAD1, NPEOPLE # of people earning informal income, ORDCOMP order interacted with cash income, NMTHS3, PVASSET1

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-27138.668	18002.063		-1.508	.134
SCHHEAD1	-2572.830	1631.123	-.121	-1.577	.117
PVASSET1	.166	.043	.300	3.891	.000
ORDCOMP order interacted with cash income	3251.951	1696.004	.133	1.917	.057
NPEOPLE # of people earning informal income	23386.390	7475.486	.203	3.128	.002
NMTHS3	5075.361	1062.070	.341	4.779	.000
FEMHEAD3	-82493.146	32982.719	-.166	-2.501	.013
MINE mining business	248303.584	66204.167	.252	3.751	.000
MTHTIMB	9504.631	3798.038	.163	2.503	.013

a Dependent Variable: VINFORM earnings from all informal off-farm activities

Informal Off-Farm, Conditional Models

Per Capita Income Quintile 5

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.701(a)	.491	.446	115820.35833	

a Predictors: (Constant), CARP carpentry, PVASST02 Unstandardized Predicted Value, MTHJAGG, MTHDRIVE, MASON masonry business, FEMHEAD3, MTHRET, CLOTHES clothes business, MTHAGTRD, SCHHEAD3, MTHTIMB, ORDCOMP order interacted with cash income, PVASSET1

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-134631.380	28478.984		-4.727	.000
ORDCOMP order interacted with cash income	15689.930	2865.957	.355	5.475	.000
PVASST02 Unstandardized Predicted Value	.150	.036	.286	4.217	.000
PVASSET1	-.103	.060	-.113	-1.705	.090
FEMHEAD3	-113641.348	55290.589	-.127	-2.055	.042
SCHHEAD3	3751.256	2123.489	.112	1.767	.079
MTHTIMB	24383.343	4872.939	.317	5.004	.000
MTHDRIVE	10197.891	4417.743	.137	2.308	.022
MTHJAGG	18327.899	7016.766	.157	2.612	.010
MTHAGTRD	5142.097	2192.727	.142	2.345	.020
MTHRET	3716.705	1930.822	.120	1.925	.056
CLOTHES clothes business	67797.242	43328.296	.095	1.565	.120
MASON masonry business	87661.476	59618.272	.088	1.470	.144
CARP carpentry	241495.089	88435.082	.172	2.731	.007

a Dependent Variable: VINFORM earnings from all informal off-farm activities

H. Salaries and Remittances, Conditional Models

Per Capita Income Quintile 1

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.812(a)	.659	.628	13100.15478	

a Predictors: (Constant), MTHIND, MTHSHOP, MTHCLERK, MTHBANK, ORDCOMP order interacted with ecompare, SCH_HEAD years of schooling for hh head, WAGERATE Daily wagerate, NMTHS # of months hh had income from sal or remit, MTHFARM, MTHPENS, NMTHS1, MTHREMIT, NPEOPLE1

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-13728.216	4546.908		-3.019	.003
ORDCOMP order interacted with ecompare	1257.135	333.895	.199	3.765	.000
NMTHS # of months hh had income from sal or remit	2549.558	337.135	.530	7.562	.000
NMTHS1	1788.611	525.751	.312	3.402	.001
NPEOPLE1	-9827.144	3831.283	-.288	-2.565	.011
WAGERATE Daily wagerate	98.252	47.840	.137	2.054	.042
SCH_HEAD years of schooling for hh head	879.848	311.647	.150	2.823	.005
MTHREMIT	-2269.127	301.423	-.523	-7.528	.000
MTHCLERK	5022.872	1037.656	.270	4.841	.000
MTHSHOP	7689.606	1385.334	.345	5.551	.000
MTHFARM	-1593.424	513.020	-.174	-3.106	.002
MTHPENS	-973.811	628.458	-.087	-1.550	.123
MTHBANK	1553.722	680.036	.120	2.285	.024
MTHIND	1112.257	510.108	.120	2.180	.031

a Dependent Variable: VSALREM earnings from all salary and remittance

Salaries and Remittances, Conditional Models

Per Capita Income Quintile 2

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.693(a)	.481	.448	26605.22460	

a Predictors: (Constant), MTHCIVIL, MTHPOL, MTHCLERK, MTHIND, MTHTEACH, NPEOPLE # of people earning sal or remit, NMTHS # of months hh had income from sal or remit, ORDCOMP order interacted with ecompare, MTHREMIT

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-33979.180	8957.251		-3.793	.000
ORDCOMP order interacted with ecompare	2990.226	644.458	.306	4.640	.000
NPEOPLE # of people earning sal or remit	10337.267	4185.500	.161	2.470	.015
NMTHS # of months hh had income from sal or remit	2182.949	656.738	.232	3.324	.001
MTHREMIT	-1025.926	475.840	-.159	-2.156	.033
MTHPOL	4237.538	1213.430	.226	3.492	.001
MTHTEACH	2172.809	686.436	.202	3.165	.002
MTHCLERK	2231.012	890.693	.158	2.505	.013
MTHIND	1890.490	835.276	.149	2.263	.025
MTHCIVIL	4845.734	2252.690	.130	2.151	.033

a Dependent Variable: VSALREM earnings from all salary and remittance

Salaries and Remittances, Conditional Models

Per Capita Income Quintile 3

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.815(a)	.664	.620	33493.96355	

a Predictors: (Constant), MTHPOL, ORDCOMP order interacted with ecompare, MTHCLERK, NPEOPLE3, NMTHS # of months hh had income from sal or remit, MTHDRIVE, MTHLEC, PVASST02 Unstandardized Predicted Value, MTHIND, NPEOPLE2, MTHREMIT, FEMHEAD3, MTHTEACH, SCHHEAD2, SCHHEAD3, ZONE2, ORDCOMP3, ZONE3

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-61769.281	13705.392		-4.507	.000
ORDCOMP order interacted with ecompare	4922.440	949.658	.335	5.183	.000
ORDCOMP3	-2714.116	1821.310	-.234	-1.490	.138
PVASST02 Unstandardized Predicted Value	.031	.015	.107	2.032	.044
FEMHEAD3	60587.645	18365.337	.197	3.299	.001
SCHHEAD2	2866.092	1446.366	.182	1.982	.050
SCHHEAD3	6977.398	1577.497	.514	4.423	.000
NPEOPLE2	44316.014	8848.375	.504	5.008	.000
NPEOPLE3	46453.242	13825.631	.459	3.360	.001
NMTHS # of months hh had income from sal or remit	4757.672	953.254	.285	4.991	.000
MTHDRIVE	4630.999	969.349	.258	4.777	.000
MTHTEACH	2457.868	783.567	.182	3.137	.002
ZONE2	-72614.390	16040.725	-.548	-4.527	.000
ZONE3	-87033.955	26730.287	-.677	-3.256	.001
MTHIND	2512.816	1060.242	.130	2.370	.019
MTHCLERK	2183.492	1190.509	.103	1.834	.069
MTHLEC	-6593.321	2927.426	-.117	-2.252	.026
MTHREMIT	-1100.093	583.739	-.112	-1.885	.062
MTHPOL	4290.148	2822.368	.076	1.520	.131

a Dependent Variable: VSALREM earnings from all salary and remittance

Salaries and Remittances, Conditional Models

Per Capita Income Quintile 4

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.698(a)	.487	.452	51115.01480	

a Predictors: (Constant), MTHTEACH, SCHHEAD1, MTHSALES, NPEOPLE # of people earning sal or remit, MTHFARM, NMTHS # of months hh had income from sal or remit, ORDCOMP order interacted with ecompare, MTHREMIT, SCH_HEAD years of schooling for hh head, ZONE1

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-80635.725	17886.578		-4.508	.000
ORDCOMP order interacted with ecompare	2983.035	1047.050	.189	2.849	.005
SCH_HEAD years of schooling for hh head	1779.469	1176.256	.118	1.513	.133
SCHHEAD1	5976.984	2616.988	.317	2.284	.024
ZONE1	-40307.939	23826.004	-.222	-1.692	.093
NPEOPLE # of people earning sal or remit	40497.952	7555.627	.350	5.360	.000
NMTHS # of months hh had income from sal or remit	4816.867	1470.320	.226	3.276	.001
MTHREMIT	-2474.435	934.888	-.183	-2.647	.009
MTHFARM	-5438.789	2050.378	-.168	-2.653	.009
MTHSALES	3347.529	1843.482	.113	1.816	.071
MTHTEACH	2055.285	985.437	.143	2.086	.039

a Dependent Variable: VSALREM earnings from all salary and remittance

Salaries and Remittances, Conditional Models

Per Capita Income Quintile 5

Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	1
.840(a)	.706	.677	62009.49880	

a Predictors: (Constant), ZONE2, NMTHS # of months hh had income from sal or remit, MTHMGR, MTHLEC, MTHBANK, MTHPOL, MTHPENS, MTHREMIT, NPEOPLE1, PVASST02 Unstandardized Predicted Value, NPEOPLE # of people earning sal or remit, SCH_HEAD years of schooling for hh head, ORDCOMP1, NPEOPLE2

Coefficients(a)

	B	Std. Error	Beta	t	sig
(Constant)	-138463.686	23560.279		-5.877	.000
ORDCOMP1	6101.218	2397.505	.297	2.545	.012
PVASST02 Unstandardized Predicted Value	.033	.019	.092	1.727	.086
NPEOPLE # of people earning sal or remit	87405.544	7689.324	.647	11.367	.000
NPEOPLE1	-56402.568	18483.930	-.362	-3.051	.003
NPEOPLE2	-79117.668	19562.942	-.480	-4.044	.000
SCH_HEAD years of schooling for hh head	4336.894	1286.250	.193	3.372	.001
NMTHS # of months hh had income from sal or remit	6604.217	1904.267	.169	3.468	.001
MTHMGR	11107.376	2148.505	.255	5.170	.000
MTHLEC	10286.180	2804.355	.180	3.668	.000
MTHBANK	6468.358	2078.183	.148	3.113	.002
MTHREMIT	-3288.065	1093.811	-.172	-3.006	.003
MTHPENS	-4116.847	1520.631	-.130	-2.707	.008
MTHPOL	9021.798	4522.343	.112	1.995	.048
ZONE2	83747.872	36380.611	.247	2.302	.023

a Dependent Variable: VSALREM earnings from all salary and remittance

Annex E:

Procedures for Generating Income and Income Component Estimates Using Spss/windows Syntax File

To generate estimates of income and income components using SPSS/Windows, first clean the data. After cleaning, all conversion of questionnaire variables to proxy variables, and use of those variables to compute estimated incomes and income components, will be done by an SPSS syntax file developed by Tegemeo/MSU. The steps for using the SPSS for Windows package are as follows:

1. Enter the questionnaire data in the following files (note that "??" in each file name refers to the two-digit year in which the survey was conducted; for surveys done in 2002, "??" should be replaced with "02"):

File #	File Name	Relation to Questionnaire	Variables
1	HHIDFINAL??.SAV	First page – ID variables	key variables ENUM, REPLACE
2	HH??.SAV	Household level file - all questions not in tables	key variables TACRE1 ... WAGE
3	DEMOG??.SAV	Member level file - all data from Household Member tables	key variables MEM NAME D01 ... D111
4	CROP??.SAV	Crop level file -- all data from "Cereals, Tubers, Pulses", "Fruits & Vegetables", "Industrial Crops" tables	key variables CROP PROD ... SELL
5	LIVESTK??.SAV	Animal level file -- Livestock table	key variables ANIMAL NAMIM, SELLANIM
6	LIVEPROD??.SAV	Animal products level file -- Livestock products table	key variables ANIMPROD NPROD, SELLPROD
7	OFFARM??.SAV	Month level file – all data from "Participation in off-farm activities over the past 12 months" table	key variables MONTH INFMTH, SALMTH

File #	File Name	Relation to Questionnaire	Variables
8	BUSLAB??.SAV	Activity level file – data from left hand portion of "Business and informal off-farm activities, and salaried wage labour" table	key variables ACTINF INFORMAL
9	SALWAGE??.SAV	Activity level file – data from right hand portion of "Business and informal off-farm activities, and salaried wage labour" table	key variables ACTSAL SALARIED
10	ASSET??.SAV	All data from assets table	key variables ITEM QTY
12	ECACT??.SAV	All data from "Importance of Income Sources" Table	key variables ECONACT ORDER

2. Save these uncleaned files in a folder of your choice. This will be your copy of the original, uncleaned data, which should not be changed.

3. Create the folder c:\proxy??\incprox\data and copy all 12 uncleaned files to it. As in the file naming conventions in the table above, replace "??" with the two digit year of the survey, e.g., "02" if the survey was conducted in 2002.

4. Clean the files in c:\proxy??\incprox\data using procedures your institution has developed with other surveys, and save the files to the same names. You will now have uncleaned, original data in a folder of your choice, and cleaned data in c:\proxy??\incprox\data.

5. Create the folder c:\proxy??\incprox\syntax and copy the file IncproxEstimateKenya.sps to it. Tegemeo/MSU will provide you with a copy of this file upon request.

6 Run IncproxEstimateKenya.sps. This file will create all required proxy variables and generate income results, saving them to the file IncomeKenya.sav. It will also deliver mean and median values for household income and income components in the SPSS Output Navigator.