Household income and expenditure studies

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Introduction

Very little is known about the economics of household level activities in pastoral production systems (Eicher and Baker, 1982). Despite this, interventions are frequently proposed which call for increased cash expenditures. The implications of this for different groups of households (poor, rich) needs to be assessed. An intervention may require increased labour input. Will there be enough labour and if so will sufficient food be available to sustain the energy requirements of increased effort? An intervention may call for culling of non-productive and old animals from herds and flocks. What is the implication of this for the security and viability of different groups of pastoral households (rich, poor)? What needs of pastoral households can be manipulated to provide incentives for culling? It is in such a context that information on household income and expenditures is required.

Testing and evaluating the impact of interventions as well as assessing the welfare of pastoralists require bench-mark data on income and expenditure patterns of different groups of pastoral households.

Unlike agriculturalists, pastoral households depend more on market transactions to satisfy their subsistence needs. Our own work in Kenya shows that even during the wet season the Maasai obtain up to 50% of their calorie intake from purchased food. This figure can increase to 70% during the dry season. Household income and expenditure data are useful for determining the demand of pastoralists for purchased goods and social services and for assessing the terms of trade between pastoralists and the rest of the economy. A very good example is given by Swift (1979) for Somali pastoralists. He analysed

the barter terms of trade between pastoral products sold by pastoralists and those they purchase by constructing a pastoral cost of living index. He concluded that by the early 1970s their terms of trade had deteriorated and had "led the pastoral economy into a precarious position".

Collection of households income and expenditure data

In addition to producing milk and meat for their own consumption, pastoral households engage in a variety of transactions involving livestock, livestock products, cash and other items (such as crops, handicrafts etc.), to fulfill different goals. Animals and their products are sold to provide cash. They are given or lent to kin and friends to strengthen social ties and ensure long-term security. They may be similarly received. Animals may be exchanged for social reasons or to increase the productive capacity of herds and flocks.

In order to determine the entire household budget, income and expenditure studies should be designed in such a way as to include not only cash income and expenditures but also these important transactions. Usually, the quantities of these transactions are known and their values can be determined by using prices the items would have attracted had they been sold.

Sampling the target population

In any society the most important factor that influences patterns of household income and expenditure is the wealth status of the household. It is self-evident that the consumption of poor and rich households is markedly different. It is therefore essential that study samples adequately represent the gradient of wealth observed in the pastoral group under study. This may not present a problem in situations where a whole village or encampment or target population is studied as done by the ILCA teams in Mali and Kaduna. Even then villages and camps may be formed on the basis of social classes. Care should be taken in selecting sample villages and camps so that results can be generalisable to a known population type. In situations where the coverage in area is more extensive one has to resort to sampling the population as done by the ILCA teams in Kenya and Ethiopia. In that case a

stratification of the population into wealth categories is essential (see Grandin (1983) for a detailed discussion of wealth effects and a rapid method of wealth ranking).

Given such a stratification of the target population, the available resources for collecting data and the time-frame and nature of the study, standard sampling procedures can be employed to determine the size of the sample and choosing them (Cochran, 1963).

Types of data required

Inventory of resources

Once the sample households in the study have been determined, an initial inventory of the human and livestock population needs to be made. Here care should be taken so that animals owned by the household but which are away from the main herd or flock at the time of the inventory are included. Animals not owned by the household but borrowed from others should be identified and recorded as such. Similarly members of the household who are away at the time of the census should be included and temporary visitors excluded. An inventory of major household goods also gives a good indication of investment and consumption patterns.

This information is vital for two reasons. First, it quantifies the wealth status of the sample household. Second, it provides the basic population data to perform per capita computations without which meaningful comparative analysis cannot be made.

Household income and expenditure items

For designing the data collection formats background information is required on the nature of items that form the income and consumption baskets of the pastoral households to be studies as these vary from culture to culture. A comprehensive list of these items should be established from the researcher's personal knowledge or from informal surveys involving a few pastoralists and shopkeepers in the area or a combination of these. In addition to standardising the format for enumeration, it is also a good device to facilitate recall by respondents.

The income items include :-

- livestock and livestock products (animals, milk, ghee, hides and skins, manure etc.)

- agroforestry products (crops, wood, charcoal, honey etc.)

- cottage industry products (handicraft, beer, medicinal herbs etc.)

- other forms of employment (trade)

- other cash inflows (remittance, borrowing)

Cash expenditure items can be grouped as:-

- food
- health and hygiene
- clothing
- transport
- livestock
- livestock inputs
- durable household goods
- others (cash outflows such as loans given).

Frequency of data collection

Extracting information on household budgets, especially expenditures, is extremely difficult because one has to rely on the memory of the respondents to recall such data. Information on pastoral households' income is by far easier to get because most of it is derived from the sale of animals, which they remember very well. The fact that such sales happen very infrequently facilitates recall. On the other hand expenditures, especially on food items, occur so frequently in irregular amounts that recall becomes difficult.

In collecting household income and expenditure data, the shorter the time span the respondent is requested to recall the more accurate is the information obtained. Researchers have used different frequencies of collecting such data ranging from one-shot surveys asking questions to estimate income and expenditure for a specified period of time (e.g. per month or per week etc.), to continuous daily recording for a long period of time (a year or more). Within ILCA, the Kenya team has used a frequency of once a month, the Kaduna and Mali teams twice weekly. Of course the latter is more reliable but

is, however, very expensive. Unless it is combined with the conduct
of other research requiring daily observations, it may not be solely
justified on the basis of the precision gained. Even after using this
method in Mali, Swift (1983) writes:-

> 'It is likely that enumerators were only partially sucess-
> ful in recording these details of household daily trans-
> actions. There was inevitably some resistance to such
> detailed questioning and at times clearly false information
> was given or important transactions were forgotten or
> concealed.'

Our own experience in Kenya using a once-a-month recall
method proved that respondents could account only for about 70% of
their cash income. In conjunction with a nutrition study, which
required food intake data on a daily basis, household expenditures
were monitored for a month on a daily basis on selected households.
A comparison of the two methods showed that the monthly recall ac-
counted for 73% of the total expenditures recorded on a daily basis.

Table 1. *Comparison of monthly and daily recalls on four households
in Merueshi Group Ranch, Kenya (October, 1982).*

| ITEM | CASH EXPENDITURES FOR ONE MONTH ON | | | | | | | |
| | Food | | Livestock | | Others | | Total | |
	Monthly recall	Daily recall	Monthly recall	Daily recall	Monthly recall	Monthly recall	Daily recall	Mon. rec.
KShs	1308	3047	1905	1980	1188	1015	4401	6042
Proportion of total	0.30	0.50	0.43	0.33	0.27	0.17	1.0	1.0
Ratio of monthly recall to daily recall	0.43		0.96		1.17		0.73	

Source: ILCA/Kenya (unpublished data).

However, this percentage varied significantly across different expenditure categories as shown in Table 1. The monthly recall method underestimates food expenditures substantially, proving that frequent but irregular flows are hard to recall during a long period of time. Researchers with wide experience in this field recommend that a three-day span is the most that respondents can recall with a high degree of accuracy (Nestel, pers. comm.)

The frequency of collecting household and income expenditure data should depend on the nature of the research. If a complete understanding of the process is required the highly expensive more frequent methods need to be used. If general orders of magnitude are required the less frequent methods may be used. One may even sample seasonally by concentrating interviews during specific months or weeks in dry and wet seasons. Unfortunately, one may not encounter normal wet and dry seasons, especially in East Africa. One must, therefore, take into account the degree of representativeness of such samples in the analysis of the data (see below).

Quality control in enumerator data collection

Invariably, enumerators are used to advantage to obtain income and expenditure data covering a large number of households in one or more geographic locations simultaneously. The use of enumerators, however, introduces biases in the data collected as noted above. Careful training and supervision is essential.

Analysis of data

Table 2 shows a summary of income and expenditure patterns of Tuareg households in Mali. The dominant source of income is the sale of animals, representing 42% of total income. Salaries earned are a close second accounting for 35%. Income from cereals, other food and consumption items and clothing is not from the sale of these items as such, but represents the value of these items obtained in exchange. The purchase of food items accounts for 49% of total expenditures, the most prominent item being cereals (22%). Expenditure on the purchase of livestock and livestock inputs is also high (32%) followed by expenditures on clothing (10%).

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Table 2. *Mean annual household income and expenditure of 16 Tuareg households in Mali.*

	Income		Expenditure	
	Amount (MF)	%	Amount (MF)	%
Animals	92,350	42	66,194	32
Milk	1,069	–	6,600	3
Cereals	16,038	7	46,919	22
Other food and consumption	15,963	7	51,319	24
Clothing	1,813	1	21,506	10
Equipment and artisan work	15,150	7	9,556	5
Salarie etc.	78,250	35	9,425	4
TOTAL	220,656	100	209,519	100

Source: Swift (1982).

Tables 3 and 4 give a summary of per capita income and expenditures of Maasai households in Mbirikani Group Ranch in Kenya. In this case opportunities to earn income from employment outside the pastoral sector are restricted. Livestock sales (mainly cattle) represent a very high proportion (83%) of total cash income. The only other significant source of cash income is trading in livestock, which provides 11% of total cash income.

Table 3. *Sources of cash income of Maasai pastoralists in Mbirikani Group Ranch (July 1981 to June 1982)*

Source	cash income Mean annual per capita	
	KShs	%
Livestock sales	1523	83
cattle	1474	81
smallstock	49	2
milk sales	0	0
hides & skins	9	1
Trading	205	11
Remittance	9	1
Borrowing	42	2
OTHERS	38	2
TOTAL	1821	100

Source: ILCA, Kenya 1982 (unpublished data).

Table 4 gives a more disaggregated picture of mean per capita cash expenditure for food and non food items excluding purchases of livestock and livestock inputs. Cereals, sugar (consumed in tea with milk) and fats/oils, which provide a substantial portion of the calorie requirements of the Maasai, are the major items of cash expenditure, followed by clothing.

From the above it is clear that the pastoral households studied both in Mali and Kenya spend a very high proportion of their income on food and livestock. The income elasticity of food expenditure is very low.

Table 4. *Annual per capita expenditure on food and non-food items by Maasai households in Mbirikani Group Ranch (July 1981 to June 1982).*

Food items	Expenditure	
	KShs	% of total food items
Maize	222*	49
Wheat	20	4
Sugar	55	14
Tea	30	7
Fat/oils	29	6
Potatoes	7	2
Vegetables	2	0
Meat	6	2
Other food	6	2
Subtotal	387	86
Hotel food	28	6
Hotel drink	36	8
Subtotal food items	451	100

Non-food items		% of total non-food items
Tabacco	3	4
Kerosine	2	2
Soap/Omo	5	6
Transport	13	15
Medical	9	11
Clothing	47	56
Household items	3	4
Beads	2	2
Subtotal non-food items	84	100

Source: ILCA, Kenya 1982 (unpublished data).

*74 kg per capita per annum.

Since the consumption of other **items is almost negligible,**
the implication is that any increased income **will be largely spent** on
the purchase of breeding stock unless attempts are made to increase
pastoralists' demands for other consumption and investment items.

A more sophisticated analysis of household income and
expenditure data can be performed using regression techniques. A
common representation of this is given as:

$$E_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_m X_m$$

where $\quad E_i =$ Expenditure on the ith commodity or group of
commodities

$\beta_0 =$ least square mean

$\beta_j (j = 1, 2 \ldots\ldots, m) =$ coefficients of the independent variables

$X_j (j = 1, 2 \ldots\ldots, m) =$ independent variables specified as determinants
of expenditure e.g. $x_1 =$ household size

$x_2 =$ wealth or income group

$x_3 =$ season of the year etc.

Usually, the log form of the above function is preferred
as the coefficients specified directly produce elasticities of expenditure.

The main determinants of expenditures of pastoral households
are: (a) household size, (b) income or wealth status and (c) seasons
of the year.

Ceteris paribus, the larger the household size the higher
the expenditure, the higher the wealth status of the household the
bigger the expenditure, and the drier the season the larger the expenditure, especially on food. Table 5 shows how the cash income and
expenditures on cereals of the Tuareg in Mali is affected by the
different seasons.

Table 5. *Seasonal cash income and expenditures on cereals of 16 Tuareg households in Mali (1971-1981).*

Season	Cash income Excluding salaries		Cash expenditure on cereals	
	MF	%	MF	%
Hot (March-June)	39,100	38	23,806	53
Rains (July-October)	44,206	42	12,513	27
Cold (November-February)	20,088	20	9,300	20
TOTAL	103,394	100	45,619	100

Source: Swift, 1982.

The use of expenditure baskets of pastoralists to calculate terms of trade for pastoral products as calculated by Swift (1979) is shown in Table 6.

Table 6. *Barter terms of trade for pastoral products in southern Somalia*

Camels	1847	1891	1951-53	1956-58	1971-72	1974-75
			Barter value of 1 adult male camel			
rice (kg)	140	204	71	108	159	192
maize (kg)		978	380	472	165	421
sorghum (kg)	1110	978	490	460	284	1070
sugar (kg)	22	81	88	88	111	156
tea (kg)			25	22	27	49
dates (kg)	265	341				
local cloth (yd)	83	25				
American grey sheeting (yd)		138				
Indian printed cloth (yd)		576				
cotton futa cloth (yd)			39	43		

Cattle						
			Barter value of 1 adult ox or bull			
rice (kg)	140	184	44	61	86	95
maize (kg)		880	235	267	164	418
sorghum (kg)	1110	880	305	260	154	648
sugar (kg)	22	73	55	50	60	156
tea (kg)			16	12	15	30
dates (kg)	265	306				
local cloth (yd)	83	22				
American grey sheeting (yd)		124				
Indian printed cloth (yd)		518				
cotton futa cloth (yd)			24	24		

Sheep						
			Barter value of 1 adult sheep			
rice (kg)	21	10	12	16	41	25
maize (kg)		49	63	69	78	108
sorghum (kg)	167	49	81	68	73	167
sugar (kg)	3.2	4.1	15	13	29	24
tea (kg)			4.2	3.2	7	8

Table 6 cont.

	1	2	3	4	5	6
dates (kg)	40	17				
local cloth (yd)	13	1.2				
American grey sheeting (yd)		7				
Indian printed cloth (yd)		29				
cotton futa cloth (yd)			6.4	6.3		

Goats	Barter value of 1 adult goat					
rice (kg)	14	5	9	12	32	15
maize (kg)		24	49	54	61	68
sorghum (kg)	111	24	59	53	57	105
sugar (kg)	2	2	11	10	22	15
tea (kg)			3	3	6	5
dates (kg)	27	8.4				
local cloth (yd)	8	0.6				
American grey sheeting (yd)		3.4				
Indian printed cloth (yd)		14				
cotton futa cloth (yd)			5	5		

Ghee	Barter value of 1 kg ghee					
rice (kg)	4	5	2	4	7	5
maize (kg)		23	11	16	13	23
sorghum (kg)	29	23	14	15	12	36
sugar (kg)	0.6	2	3	3	5	5
tea (kg)			0.7	0.7	1	2
dates (kg)	7	8				
local cloth (yd)	2	0.6				
American grey sheeting (yd)		3				
Indian printed cloth (yd)		13				
cotton futa cloth (yd)			1	1		

Source: Swift, 1979.

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Etudes sur les revenus et les dépenses monétaires des ménages

Résumé

On dispose de peu de renseignements sur l'économie des ménages dans
les systèmes de production pastorale. En dépit de cela, des inter-
ventions qui impliquent l'accroissement des dépenses monétaires
sont fréquemment proposées. L'expérimentation et l'évaluation des
interventions et de leurs effets de même que l'évaluation de la
qualité de la vie des éleveurs nécessitent des données de base sur la
structure du revenu et des dépenses de différents groupes de ménages
pastoraux.

Outre la production de lait et de viande auto-consommée, les ménages
pastoraux participent à diverses transactions de bétail, de produits
animaux, de cultures commerciales, d'objets artisanaux etc., en vue
de réaliser leurs différents objectifs. Pour déterminer la totalité
du budget du ménage, les études sur le revenu et les dépenses doivent
être conçues de sorte à refléter non seulement le revenu et les
dépenses monétaires mais aussi d'autres transactions importantes.

Dans toute société, le facteur le plus important qui influence la
structure des revenus et des dépenses du ménage est la richesse du
ménage. Il est évident que la consommation est différente selon qu'il
s'agit d'un menage riche ou pauvre. Il est par conséquent essentiel
que les échantillons de l'étude représentent adéquatement le gradient
de richesse observé dans le groupe pastoral étudié. Une fois que les
ménages-échantillons de l'étude auront été déterminés, il faudra
entreprendre un inventaire initial de la population humaine et
animale. Un inventaire des biens essentiels du ménage donne également
une image fidèle de la structure des investissements et de la
consommation. Cette information est vitale pour deux raisons: elle
quantifie la richesse du ménage - échantillon et fournit des
données de base sur la production pour effectuer les calculs par tête
d'habitant sans lesquels aucune analyse comparative significative
ne peut être effectuée.

Pour la conception des formulaires de collecte de données, il convient de rassembler des informations sur la nature des éléments qui forment le revenu et la consommation des ménages pastoraux à étudier, étant donné que ceux-ci varient d'un cadre culturel à l'autre.

Dans la collecte des données sur le revenu et les dépenses du ménage, l'information recueillie est d'autant plus exacte que la période de rappel est courte. La fréquence de la collecte des données sur les dépenses et les revenus des ménages devrait être fonction de la nature de la recherche entreprise. Si une compréhension approfondie du processus est requise, ce sont les méthodes fréquentes, très coûteuses qui doivent être utilisées. Par contre, si les ordres de grandeur requis sont généraux, il convient d'utiliser les méthodes les moins fréquentes.

Les enquêtes effectuées au Kenya et au Mali ont clairement montré que les ménages pastoraux observés dépensaient une très forte proportion de leur revenu pour acquérir des produits alimentaires et du bétail. Puisque la consommation des autres produits était presque insignifiante, on peut en déduire que tout accroissement du revenu sera en grande partie consacrée à l'acquisition de reproductrices, à moins que des efforts ne soient déployés pour accroître la demande pour d'autres biens de consommation et d'investissement.

Une analyse plus sophistiquée des données sur les dépenses et les revenus des ménages peut être effectuée en utilisant les techniques de régression.