CONTRIBUTION OF DAIRY GOATS TO POVERTY REDUCTION IN RURAL TANZANIA: THE CASE OF THE ULUGURU MOUNTAINS

Mdoe, N.S.Y. and Paschal, P. Department of Agricultural Economics and Agribusiness, Sokoine University of Agriculture, P.O BOX 3007 Chuo Kikuu, Morogoro, Tanzania.

SUMMARY

Like other developing countries, poverty in Tanzania tends to be worse in rural areas where majority of the people live. Since rural people depend on diverse sources of income, analyzing the contribution of the different sources of income is central for identifying important income generating activities for support. This paper examines the contribution of dairy goat production to household income, food security/nutrition and poverty reduction on the Uluguru Mountains of Tanzania. Data used for the study were collected using a structured questionnaire administered to 42 randomly selected households who kept dairy goats. The results of the study indicate that dairy goats have the potential of reducing rural poverty through their contribution to household income, food security and nutrition. The income from dairy goats accounted for only 23% of the poverty line (a dollar per day), suggesting that the dairy goat enterprise alone cannot reduce poverty. Diverse sources of income are important for rural poverty reduction. However, dairy goats deserve particular attention in rural poverty reduction programs due to the fact that goats have low initial cost of establishment and can therefore be easily adopted by resource poor farmers compared with large animals like cattle. Therefore development partners can effectively assist in rural poverty reduction by increasing funding for dairy goat development projects rather than directing most of the resources to intensive dairy cattle development as it has been the case for most dairy development projects in Tanzania.

INTRODUCTION

Poverty can be defined as deficient symptoms in various spheres of human life; including nutrition, education, housing, clothing, healthy, water, sanitation, employment, expenditure, consumption and income. Tanzania's per capita income of US$ 270 in 1999, makes it one of five poorest countries in the World. The number of people who live in abject poverty, i.e. those who live on less than US$1 a day make up 50% of the population. In Tanzania, like in most of other

developing countries, poverty as measured by income tends to be worse in rural areas where majority of the people live (Kayunze and Kihiyo, 2000). About 60% of Tanzanians who live in rural areas compared to 39% in urban areas are in the abject poverty and about 90% of the poorest of the poor live in rural areas (World Bank, 2001, URT, 2001a).

Poverty is one of the major causes of food insecurity in Tanzania. World Bank (1986) defines food security as access by all people at all times to adequate food for an active and health life. Adequacy has to be both in quantity and quality sufficient to support a healthy life. This requires that the diet supplies enough energy (Calories), proteins, minerals and vitamins. While plant foods are capable of supporting a healthy life, efficient utilization of nutrients requires a balance between foods of plant and animal origin. Therefore food insecurity exists when people are undernourished due to physical unavailability of food, their lack of physical, social and economic access to food and/or inadequate biological utilization of food by the body (McCalla, 1999).

The objective of the government, through Vision 2025 and the Poverty Reduction Strategy Paper (PRSP) is to (i) raise the per capita income of Tanzania from 210 to 3420 US$ by 2025, (ii) reduce abject poverty by 50% by the year 2010 and (iii) eradicate abject poverty and hence food insecurity by the year 2025 (URT, 2000).

Since most (84%) of the active population depends on agriculture for their livelihoods, it means that the above targets will mainly be achieved through improving agriculture (crop and livestock) production. According to the 1998/99 District Integrated Agricultural Survey (URT, 2001b), about 1,606,000 households kept 16,395,000 cattle (10/hh), 1,742,000 households kept 11,643,000 goats (7/hh); 628, 300 households had about 3.5 million sheep while 3,353,000 households kept 27 million chickens (8/hh). It is thus obvious that livestock play a significant role in the livelihood of the majority of rural people both as a source of income and food. Recent studies (Winrock International, 1992; ILRI, 1999; Ashley et al., 1999) have shown the potential of livestock to contribute to household income, food security and poverty alleviation in sub-Saharan Africa. However, the contribution of livestock varies from one farming system and from one livestock species to another.

This paper uses two major indicators of poverty, namely income and level of food security to determine the contribution of dairy goats to poverty reduction in Mgeta Division on the Uluguru Mountains of Tanzania. A few dairy goat development projects have been introduced in the country. The most documented and better known are the Mgeta dairy goat project and the FARM Africa dairy goat project in Dareda village in Babati district. The history of dairy goat keeping in Mgeta can be traced back to 1982 when a project called "Improved feeding of dairy cattle in the tropics" funded by NORAD started at the Department of Animal Science at Sokoine University, Morogoro. In 1983, a component of dairy goats was included and 63 Norwegian goats' kids were imported from Norway. The purpose was to develop crosses with local goats with fair potential for milk production and distribute the crosses to smallholder farmers. An extension project was started in May 1988 to introduce these goats to smallholder farmers of which farmers in Mgeta were the first beneficiaries.

METHODOLOGY

Description of the study area

The study was carried out in Tchenzema ward which is one of the four wards in Mgeta Division, Morogoro Rural District. The other wards are Mgeta, Bunduki and Kikeo. Tchenzema was selected for the study because of the large number of dairy goat keepers compared to the other wards. Tchenzema is situated about 50-km southwest of Morogoro town in the western slopes of Uluguru Mountains. The altitude ranges from 1400 to 2000 m a.s.l. The area has a bi-modal type of rainfall, with long rains falling between February and June while short rains fall between October and December. Average annual temperature is 18°C, varying from 15 to 20°C. These temperatures are conducive for improved dairy goats.

Data collection

Data for the study were obtained from secondary and primary sources. Secondary data were collected from the Uluguru Maintain Agriculture Development Project (UMADEP) office at Nyandira and records kept by farmers in Tchenzema ward. These data include dairy goats distributed to farmers, prices of live goats, prices of veterinary drugs and feeds. Primary data were collected from a random sample of 42 smallholder farmers who kept dairy goats in three villages of

Tchenzema ward, namely Nyandira, Mwalazi and Tchenzema. The data were collected using a structured questionnaire which was administered to the sample households between December 2002 and January 2003. These data included socio-economic characteristics of the farmers, resource use pattern, crop sales, dairy goats and other livestock husbandry, input costs, incomes and their sources, marketing of dairy goat and other livestock products and constraints to dairy goat production.

Data processing and analysis

The data were processed and analyzed using the Statistical Package for Social Sciences (SPSS/PC+) software (SPSS, 1994) which generated statistics such as means, frequencies and percentages. Gross margins for the dairy goat enterprise were calculated as a basis for estimating the contribution of dairy goat products to the dairy goat income.

RESULTS

Economic activities and sources of income on the Uluguru Mountains

A total of 42 farmers were interviewed between December 2002 and January 2003. The interviewed farmers engaged in different income generating activities such as livestock keeping (pigs, dairy goats, chicken, and rabbit production), crop production (food and cash crops) and non-farm activities. Food crops grown include maize and beans and cash crops include cabbages, horticultural crops, tomatoes, and cornflowers. Those who engaged in non-farm activities such as local brew making and salary employment were few. Sample farmers were asked to mention their main source of income in their households. Most of them indicated crop production, followed by livestock production (Table 1). Apart from the main source of income, the farmers were further asked if they entirely depend on one source of income for their livelihood. All of them indicated that they depended on more than one source of income as a safety mechanism against risk associated with the various economic activities especially agriculture.

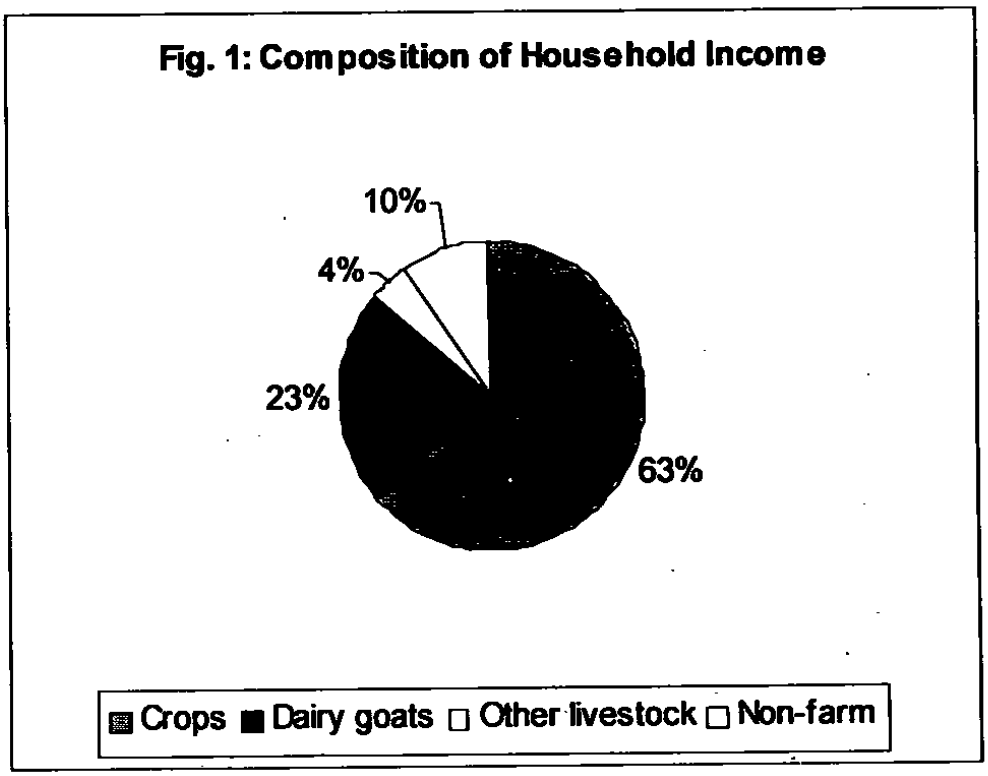
Table 1: Main income generating activities

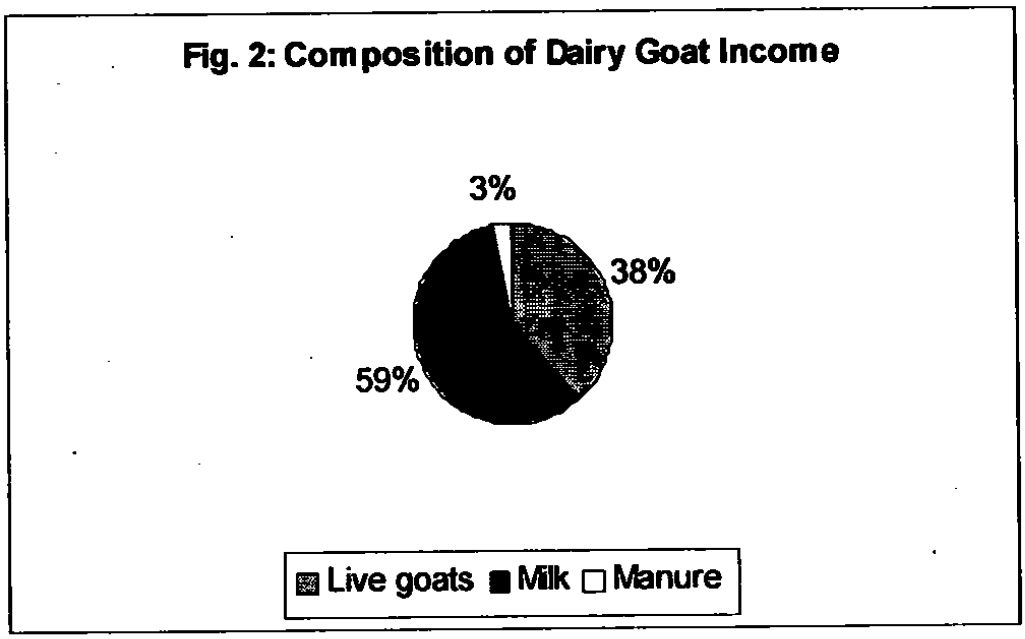
Economic activity	Frequency	Percent
Crop production	29	69.0
Livestock keeping	10	23.8
Non- farm activities	3	7.2
Total	42	100.0

Contribution of dairy goats to the household income

It is important for poverty policies to have an understanding of the contribution of dairy goats to incomes of rural households. This could help to determine the balance of public resource utilization between promoting dairy goats production on the one hand, and provide support services to crop production, other livestock species and non-farm activities. Figure 1 shows the relative contribution of various income sources to total household income in the study area. Nearly half of the household income in the study area is derived from crop sales. Income from sale of dairy goats and dairy goats products ranked second but its contribution was higher than incomes from other livestock and non-farm activities.

The dairy goat income was obtained from sale of live goats, goat milk and manure. On average, live goats were sold at 48,626 TShs per head, milk at 371 TShs per litre and manure was sold at 1,112 TShs per bag. These prices were used to calculate gross margin from the goat enterprise (Appendix 1). The average gross margin per household and per goat averaged about 303,235 TShs and 60, 646 TShs per year, respectively. Figure 2 shows the relative contribution of income from sale of live animals, milk and manure to total income from dairy goats. Most (59%) of the dairy goat income was obtained from sale of milk.





Contribution of dairy goats to household food security

In the study area, dairy goats contributed to household food security through use of dairy goat income to purchase food and consumption of milk by household members. Almost 38% of the interviewed farmers reported use of income from dairy goat enterprise to purchase staple food to supplement own grown food during food shortage periods. On consumption of goat's milk, the survey results show that the average milk consumed at home was about 1.7

litres with a minimum and maximum of 0.5 litres and 6 litres per household per day, respectively (Table 2). On average, milk consumed at home accounted for 52% of the household daily milk production. Consumption of milk contributes to food security through provision of animal proteins that nutritionally improve diets that are based on foods of plant origin.

Table 2: Milk produced, consumed and sold (litres per household per day)

	Min	Max	Mean	Std. dev.
Quantity of milk consumed at home (litres)	0.5	6.0	1.7	0.9
Quantity of milk produced per day (litres)	0.75	20.0	3.3	3.2

DISCUSSION

Income and level of food security are two major indicators of poverty. Other indicators include education, housing, clothing, healthy, water and sanitation (URT, 2000). Usually a poverty line of one US dollar per day has been used internationally to assess the level of poverty (URT, 2000). This means those earning income below one US dollar per day are impoverished. The income from the dairy goat enterprise of 303,235 TShs per household per annum is equivalent to 238.5 Tshs per adult equivalent per day. This is equivalent to 0.23 US dollars per adult equivalent per day. Thus, income from the dairy goat enterprise accounts for only 23% of the poverty line (a dollar per day). A study by Kiango (1996) in Mgeta and Babati found the average incomes earned by the households keeping dairy goats to be equivalent to 0.54 US $/day and 0.17 US $ per day respectively. The results of the present study as well as the results by Kiango (1996) suggest that dairy goat enterprise contribute to poverty reduction but does not alone ensure rural households to get out of poverty. As pointed out above, households on the Uluguru Mountains derive their incomes from various sources with crop production being the major income source. This suggests that rural poverty reduction requires promotion of diverse sources of income (diversification) than promoting a single income generating activity. Evidence from previous studies also indicate that promotion of income diversification is

important in any efforts geared towards rural poverty reduction (Barret, 2001; Ponte, 2002; Ellis and Bahigwa, 2003; Ellis and Mdoe, 2003).

The level of food security as an indicator of poverty denotes basic food needs based on specific assumptions about eating habits and nutritional requirements (URT, 2000). The fact that more than 50% of the goat milk produced was consumed by members of dairy goat keeping households suggest that the dairy goat enterprise has improved nutritional quality of foods eaten by members of these households. According to Kurwijila (2002) a diet costing 1.4 US $ a day, though provides enough calories for a Tanzanian family of 6, it supplies less than the recommended protein intake. However, addition of small amount of meat and milk makes the diet balanced at a cost of 2.11 US $ per day. This shows that a person who is a sole provider for the family and earns less than 1 dollar a day cannot provide his/her family with a balanced diet. However, this is not the case if the household is keeping livestock as it has been shown for example, that households keeping livestock consume more milk than non-cattle keeping households (Winrock International, 1992; Ashley et al., 1999; ILRI, 1999).

CONCLUSIONS AND POLICY IMPLICATIONS

This paper has shown that dairy goats have contributed to rural poverty reduction on the Uluguru Mountains through their contribution to household income, and food security. Although other livestock types such as dairy cattle have been shown to have similar contribution, dairy goats deserve particular attention for reasons of rural poverty reduction. This is due to the fact that goats can easily be adopted by resource poor farmers compared with large animals like cattle. The low initial cost of establishing a dairy goat enterprise and the ability of these animals to use marginal lands are added advantages of dairy goats relative to dairy cattle. This suggests that development partners can effectively assist in rural poverty reduction by increasing funding for dairy goat development projects rather than directing most of the resources to intensive dairy cattle development projects as it has been the case in many parts of Tanzania.

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Appendix 1: Gross margin for a smallholder dairy goat enterprise Tchenzema

Animal numbers and performance	
Average herd size (goats / household	5
Average number of goats in milk per household	2.31
Average milk yield /goat/day (litres)	3.288
Average lactation period (months)	7
Average price of milk (Tshs/litre)	371.5
Milk Revenue (Tshs) **Milk (litres/day) × no. of days ×price of milk (Tshs)**	**222719.36**
Average number of goats sold last year per household	2.97
Average price of goats @ (Tshs)	48,626.32
Revenue from the sale of live dairy goats	**14420.17**
Average amount of manure obtained per year (bags)	10.2476
Average price of manure (Tshs/bag)	1112.05
Revenue from the sale of manure (Tshs)	**11395.84**
Total revenue (sale of milk + sale of live dairy goats + sale of manure)	**378,535.37**
Variable costs	(Tshs)
Feed	34,592.68
Veterinary services	8640.26
Drugs	2890
Rope	2231.71
Concentrates	566.13
Hired labour	21580.00
Total variable costs per year	**75,300.80**
Total gross margin (total Revenue - Total variable costs)	**303234.57**
Gross Margin per mature goat per year (gross margin per number of goats kept)	60645.91
The gross margin per unit of labour used yearly (Tshs) [Assumed the family size per household = 5.48]	55334.78

Source: Survey Data (2002/03)