

**THE CONTRIBUTION OF LIVESTOCK IN LIVELIHOODS OF COCONUT- BASED
HOUSEHOLDS IN GHANA**

By: A. Osei-Bonsu and S. K. Dery

ABSTRACT

Livestock make a significant contribution to the livelihoods of coconut-based households and offer substantial scope for poverty reduction in coconut growing communities. A study was conducted on poverty reduction at Nvuma, a coconut growing community. It also examined the contribution of livestock in the livelihoods of coconut-based households and the economic and technical constraints faced by the farmers. A baseline survey was conducted to identify the needs, aspirations, opportunities and constraints in relation to the livestock kept. The project supported the farmers with training, technical advice and microcredit facility. Livestock contributed to the livelihoods of the participating households through increased income, insurance savings, improved nutrition and job creation. Knowledge of the farmer participants increased, particularly regarding the nutritional needs of livestock and disease and pest control. The farmers value their livestock first as an insurance savings, from which unexpected high expenses, like family medical bills and children school fees are paid. The microcredit provided a minimum financial base for the farmers to establish a foundation stock. It was found that provision of veterinary services is essential for the success of poor household's livestock enterprises. Support from government agencies such as the District Assemblies, NGOs and other development partners is recommended.

Keywords: Coconut Farmers, Livestock, Livelihoods

INTRODUCTION

Poverty remains one of Ghana's fundamental challenges for the population's welfare and economic growth. The Ghana living standards survey (GLSS1, 1987/88) estimated that over 43 per cent of rural inhabitants are poor. The World Bank Group (2008) associated poverty in Ghana primarily with low productivity, particularly amongst the self-employed smallholder families.

Coconut farmers in Ghana are mainly rural folks, smallholders and self employed. In most cases, they produce and sell a single low-priced product (coconut oil), earning a maximum gross income of about USD142.32 /ha/year on average holdings of 2ha or less (Dery et al., 2001). Maximum net income for the farmers is estimated at USD100/ha/yr. Thus, for those without other off-farm income sources, an annual net income of even USD200 put them well below the poverty line of USD1.00.

Given their low incomes from coconut cultivation, most coconut farmers keep livestock to earn extra income and occasionally, meet their meat protein supply. However animals are raised under traditional management systems characterized by low investment (poor feeding, housing, sanitation and disease control). Besides, these are done on a very small scale and usually on a share cropping basis. Therefore the profit margins, if any, are difficult to determine. In spite of these constraints, majority of the households continue to keep livestock and consider them important.

The important role of livestock, within the agricultural sector, in contributing to rural livelihoods, particularly those of the poor, is well recognised (LID, 1999; Upton, 2004).

An investigation was conducted to examine the contributions of livestock (both market and key non-market functions) in the livelihoods of coconut farmers, their production systems and the perceived benefits.

The objective of this study was to understand, develop and validate the aspirations of coconut farmers and assesses the contribution of livestock in the livelihoods of coconut-based households in Ghana

MATERIALS AND METHODS

BASELINE SURVEY:

A farming community with coconut cultivation as its main source of livelihood was selected for the baseline survey. Several meetings with potential participants were held to explain the concepts and objectives of the project. Interviews, using semi-structured questionnaires and in-depth discussions were held with selected participants. The objectives were to identify the needs, aspirations, opportunities and constraints in relation to the livestock kept (i.e. what were the objectives regarding livestock production and to what extent were these aspirations met with the type of livestock raised? Some issues investigated include:

- The types of livestock kept and the factors influencing the choices
- Access to livestock for the establishment of foundation stock
- Access to credit and livestock services
- Aspirations of the farmer and the perceived benefits in relation to the livestock kept
- Access to market and demand for livestock/livestock products
- Role of micro credit in smallholder resource-poor livestock keeping
- Production constraints that could be research into to improve the livestock enterprises
- Opportunities available for exploitation (See questionnaire in Appendix).

Criteria for selection of the farmer participants : A face-to-face interview with farmers in the community was conducted: Considerations were given to farmers who:

- expressed their willingness in, and commitment to participate in the project
- had coconut farm or involved in coconut processing or were prepared to plant at least 20 coconut seedlings within the 3-year duration of the project
- were able to provide the required labour - were not disabled or unable to work
- had or were able to construct some rudimentary housing units for the livestock
- had some knowledge of livestock production but with limited livestock resources to expand or start an enterprise.

Selection of livestock: In depth discussions were again held with the selected participants. Major factors considered include opportunities available in the community, the aspirations of the

farmer, rate of turnover, market value, market demand, contribution to household consumption and capital requirement in relation to the project's resources.

Sows of the local breeds, aged 3 months, were purchased and distributed to farmers who opted for piggery. Farmers who indicated their interest in poultry (native chicken) received 3 hens each whilst those interested in sheep had two each. The participants received the animals as loans in kind. All chicken supplied to participants were vaccinated for Baby Chick Ranikhet Disease (BCRD), also known as Newcastle disease, and fowl cholera. If considered necessary, pigs and sheep were given veterinary treatment.

Project support: The project supported the farmers with training on feed formulation, improved husbandry practices and pest and disease control and record keeping. Linkage was forged between the farmer participants and the Ministry of Food and Agriculture (MoFA) as well as the Animal Research Institute (ARI) for the provision of technical advice. A microcredit was established, from which small amounts were loaned (in kind) to farmers for the establishment of foundation stock and for the purchase of veterinary inputs.

Selection of beneficiaries of the microcredit: Preference was given to:

1. Poor coconut farmers, especially women, with at least one acre of land under coconut and/or who accepted to plant at least 20 coconut seedlings within 2 years of commencement of the project.
2. Farmers with previous knowledge and interest in livestock
3. Persons with little or no doubts about the beneficiary of the project (understands that the project is in his/her own interest).

Persons with history of illness that prevents them from productive activities and regular migration or not trust-worthy were excluded.

Re-payment procedures: Beneficiaries of loans were expected to pay in kind. The total cost of materials for construction of housing units, breed and veterinary supplies and services were made transparent to the beneficiaries. Written documents were prepared and signed by the farmer beneficiary, the CBO president and the project leader (official of the implementing agency), each provided with a copy of the document. Under the agreement, one livestock each of the first and

second litter/hatch, etc., were to be given to the CBO officials. One of the two animals was to be allocated to a new beneficiary whilst the other animal was to be sold and the money deposited in the CBO account.

The district agricultural extension officer was assigned the responsibility of close monitoring of farmers' investment. This officer was entitled to a monthly allowance agreed upon by the CBO officers. The last resort to repayment of loan, in case of persistent default by the farmer, was collection of nuts from his/her farm. Such nuts were to be sold by the CBO officers at prevailing market price and the sales use to defray the loan. Beneficiaries that opted for cash payment were expected to pay an interest not exceeding 10%, decided by the CBO members.

PROJECT IMPACT ASSESSMENT:

The second phase of the project examined the impact of the livestock/ microcredit intervention on 45 coconut farmers in the selected community. The objective was to assess these enterprises in both female and male headed households. Evaluation was based on benefits derived by the producing households in terms of nutrition, cash income, insurance savings, asset accumulation, job creation, fulfillment of cultural roles, and the role of the microcredit in fulfillment of livelihood aspirations of the farmer.

IMPROVED FEED MANAGEMENT FOR PIGS

Preliminary studies indicated piggery to be the most promising amongst the livestock considered under the project (Osei-Bonsu, Unpubl). About 75% of the farmers showed interest in the piggery enterprise. Subsequently and by consensus, there was need for improved technology and economic studies of the piggery enterprise.

Two piglets of local breed (aged 3months) were provided to each of 20 participants and assigned into one of two treatment groups of ten in 2007.

Treatment 1: Farmer's traditional feeding practices (coconut meal constitute 70 percent with other kitchen garbage, if available, as supplements)

Treatment 2: Improved feed management – formulated mainly from locally available by-products of tree crops (Table 1). Fish meal 5%, oyster shell 10% and salt served as supplements. When available, palm press fibre, oil palm sludge, cocoa beans shell were also used. Each piglet

received 2kg (about 3 margarine ‘family size’ tin full) of feed per day up to eight weeks of age and thereafter a 0.5 kg increment every 2 months.

Before this trial, all participants in both treatment groups received training on improved husbandry practices and feeding. The feed sources, the proportions and cost, where applicable, are presented in Table 1.

Table 1: Composition, proportions and cost of ration used in the action research

Farmer’s traditional feeding practices		Improved feed management		
Description	Quantity (g)	Description	Quantity (g)	Cost (GH¢)
Coconut cake	20	Coconut cake	15	-
Coconut chaff	50	Coconut chuff	20	-
Kitchen residue	20	Cocoa pod husk	20	-
Others (forage, bran, fruits)	10	Cassava peals	27.0	-
		Cassava leaves	5	-
		Palm kernel cake	8.5	-
		*Fish meal	3.0	0.03
		*Oyster shell	1.0	0.01
		*Salt	0.5	0.02

Fish meal 50kg =GH¢40, Oyster shell 50kg = GH¢30, Salt lick = GH¢0.40, *sold

The marginal rate of return was calculated using the formula:

$$\frac{X_1 - X_2}{Y_1 - Y_2} \times 100$$

Where, $X_1 - X_2$ is the difference in profits of the treatments and $Y_1 - Y_2$ is the difference in cost of the treatments.

RESULTS AND DISCUSSIONS

BASELINE SURVEY:

The baseline survey revealed that the livestock production systems are complex and generally based on traditional and socioeconomic considerations. The systems are characterized by low investment and mainly guided by available feed resources. Local breeds of livestock preferred as part of risk management. Traditional system of livestock management, including feeding is

widely practice and adoption of scientific recommendations or technologies is very low. Small economies of scale are common and the enterprise is mainly treated as a means of security rather than for profit.

Different livestock are kept by the households; the poor keep pigs and sheep and the poorest keep poultry (mostly native chicken). The poorest households do not have sufficient resources to purchase or maintain large stock (examples cattle and turkey). Females are more interested in poultry, with nutrition of their children as key whilst the male counterparts prefer to keep pigs, the emphasis being on cash income. Table 2 presents the types of livestock chosen and the number of male and female participants at the start of the study.

Table 2: Types of livestock raised and distribution to the initial participants

Types of livestock	No. of participants		Total
	Male	Female	
Pigs	22	8	30
Sheep	3	2	5
Chicken	5	10	15
Total	30	20	50

Benefits derive by livestock keepers in the community were found to be diverse and varied from household to household. For the poor, only few poultry products are consumed on a regular basis but are important for entertaining relatives and other visitors, especially during festivities and celebrations. Pigs contribute little to home consumption of the producing household because they are perceived to be expensive for household consumption. Sheep-keeping, though not profitable in terms of income-generation, are important for fulfillment of cultural roles, including religious sacrifices. The common aim of all the households is to make cash profit, but this is not achieve in most cases, due to the low investment and traditional system of management.

Poor coconut-based households face difficulties in acquiring livestock due to the absence of effective credit and distributive mechanisms (Kinsey, 1994; Moris, 1988; Houterman, et al., 1993). They often resort to rearing animals on share cropping basis before establishing their own stock (Table 3).

Table 3: Sources of livestock for the establishment of foundation stock

Bought from Research Institution		Bought from other farmers		Reared on share basis		Given by relatives/ friends		Total
No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.
3	7	6	13	27	60	9	20	45

Women showed interest in livestock production as it does not interfere with their responsibilities. They invest their spare time (mornings and late evenings), as animals are kept close to the homestead. Animals that are convenient for distress sales and/or could contribute directly to home consumption are usually preferred (native chicken provides a good example).

Livestock kept by the farmers are vulnerable to diseases (Table 4), because animal health services and inputs are not readily available or are simply too expensive. The high percentage of chicken lost to predators was due to the practice of free range system. Poor livestock keepers are reported to face similar constraints (de Haan, 1995; Catley, 1997; Holden et al., 1996).

Table 4: Mortality rate of livestock

Type of livestock	Lost/sold	Killed by predators	Disease/pest	Total	No. of farmers affected
Pigs	4	-	9	13	8
chicken	6	11	6	21	8
Sheep	-	-	1	1	1

Access to credit facilities is limited due to farmer's lack of collateral. Moneylenders charged high interest in the region of 50 – 100%. When given the opportunity, poor coconut farmers will use credit to purchase livestock. Appropriate savings and credit systems that address the particular needs and constraints of the poor coconut farmer are a precondition for increasing livestock production. Microcredit for example, will serve a useful purpose, such as for the establishment of foundation stock and provision of veterinary drugs or services for poor household's livestock keeping.

Marketing of livestock and livestock products is usually not a major problem to the farmers because demand exceeds supply. However, farmers are usually in a weak position to negotiate for a better price as they have no storage facilities or means of transport. Producer organizations are a necessary tool in efforts to advocate for and strengthen the competitive position of poor livestock keepers.

There are opportunities for livestock-keeping. Most farmers own their land under coconut cultivation. This could be used for the establishment of fodder for small ruminants. Integration of ruminants into the coconut farming system could be practiced to increase farm productivity. Coconut cake and chaff abounds, which are used traditionally to feed pigs and poultry. This could be improved by addition of by-products of other tree crops (oil palm and cocoa), which also abound in the community. The community has a youthful population with a large proportion of un-tapped labour. This labour could be tapped at minimum cost. There is a high demand for meat protein locally and the farmers stand to benefit if they increase their production.

PROJECT IMPACT ASSESSMENT

Results of the impact assessment (Table 5) indicate that there are diverse ways in which livestock can support the livelihoods of coconut-based households (Sumberg and Gass, 1994; Waters-Bayer and Bayer, 1994). Given these benefits in support of livelihoods, one can say that livestock has the potential to lift the poor households from deprivation to self sufficiency (Delgado et al., 1999), if the technical and economic constraints are adequately addressed (Thomas and Rangnekar, 2004).

The results also show that majority of the farmers benefited through insurance savings. This enabled the households to pay for their children school fees and unexpected high cost, such as family health bills (Beck, 1994). Sales from livestock and their products also enabled poor coconut farmers to put food on the table and improve their nutrition. This benefit was reported in most of the female headed households. More of the females showed interest in poultry with the aim of getting eggs on daily bases for their children. It is also usually convenient for poor households to consume products of chicken than those of pigs, the later presumed to be expensive for poor household consumption.

The livestock intervention supported livelihood security of 55% of the farmers through the use of sales from livestock for the purchase of planting materials, including cassava cuttings and plantain suckers and other farm inputs. Thus the stock acted as buffer to crop production (Sumberg and Gass, 1994; Waters-Bayer and Bayer, 1994). This findings clearly point to the fact that coconut farmers treat their livestock as a livelihood security and not for profit.

The livestock intervention directly targeted the poor coconut farmer and promoted sustainable improvements to their livelihoods which are consistent with the general agreement that for many of the poor, the most immediate route out of their poverty will be through measures that directly target the poor themselves (UNDP, 1997; Randhawa and Sundaram, 1990). The impact assessment concludes that livestock can be an indispensable part of the livelihood systems of many poor coconut-based households and that it can decrease the vulnerability of the households to poverty.

Table 5: Ways in which livestock support livelihoods of coconut-based households

Benefits of the Livestock intervention	Male headed household (N = 25) Yes (%)		Female headed household (N = 20) Yes (%)		Mean (%)
Increased income (profit)	10	40	9	45	42
Improve nutrition (household consumption)	5	20	12	60	55
More savings (cash)	7	28	6	30	27
Insurance savings	20	80	17	85	85
Children school fees	17	37	14	70	69
Hospital bills	15	60	10	50	56
Asset accumulation	8	32	9	45	37
Job creation	10	40	10	50	44
Cultural roles	5	20	2	10	16
Improved knowledge	18	72	15	75	73
Diversify risk	15	60	10	50	55

Re-payment of loans was low (Table 6). Most of the farmers were unwilling to pay in kind. They prefer to keep their animals at good times as an insurance savings and only sell it at emergency, such as when there is need to pay unexpected high medical bills and children school fees. Indeed, the few who paid their loans did so in cash from other sources.

Table 6: Status of the microcredit

Types of livestock	No. of beneficiaries availed loans	Amount loaned	Amount re-paid	Interest paid on loan	re-payment (%)
Pigs	20	500	200	20	40.0
Chicken	15	150	25	5	16.7
sheep	5	300	none	-	0

All amounts are expressed in Ghana cedis

Most farmers found it difficult to make savings and keep up with loan repayment. There is a general perception that money loaned to them by government for such purposes is ‘free’ or not backed by legal action

Lessons learnt from the microcredit: For microcredit to be appropriate, a pre-existing level of on-going activity, entrepreneurial capacity and managerial talent is required. If not, clients may not be able to benefit from credit, and will simply be pushed into debt. For the chronically poor coconut farmer, credit is unlikely to succeed without pre-existing effort to reduce vulnerability and to build skills, confidence, and a minimum financial base.

Risk factor - In the event where the supported income-generating intervention is so much dependent on a risk factor (example deadly disease like bird flu and foot and mouth disease), microcredit is unlikely to succeed as farmers will find excuses to default payment.

Illiteracy - where the scale of illiteracy is high coupled with poverty, it will take education to change the perception of the clients and subsequent success of the microcredit.

ECONOMIC ANALYSIS OF THE PIGGERY ENTERPRISE

The cost-benefit analysis of pigs reared under traditional feeding management (T₁) and improved feed management (T₂) is shown in Table 7. Pig reared on improved feed (T₂) gained higher weight (50kg) than those on traditional feed (40kg). Net profit was higher (GH¢49.90) under the improved feed, with a Marginal Rate of Return (MRR) of 65%.

Table 7: Cost benefit analysis of the pig rearing

Treatment s	Ration description				Total live wt meat/kg)	Rate /kg(G H¢)	Total amt (GH¢)	Net profit (GH¢)
	Qty (3 margarine tins full)	Labour cost (GH¢)	Additional ration (GH¢)	Total				
T ₁	Coconut meal	15.00	20.00	35.00	40.00	2.00	80.00	45.00
T ₂	Formulated ration	30.00	20.10	50.10	65.10	2.00	100.0	49.90

The increased profit margin of the improved feed management supports the report by Thomas and Rangnegar (2004) that overcoming technical and economic constraints could help coconut farmers take advantage of the increasing demand for livestock/livestock products.

CONCLUSION

Understanding the role of livestock (both market and non-market function) in the livelihoods of the resource-poor, their production systems and the perceived benefits, provides a framework for addressing their poverty. The livestock production systems in coconut growing communities' are complex and generally based on traditional and socioeconomic considerations. It is mainly guided by locally available feed resources and can be described as low input system. There is low technology uptake and small economies of scale are common. Poor livestock-keepers stand to benefit in diverse ways and on a sustainable basis, if the economic and technical constraints are adequately addressed. For now, and to the coconut farmer, the importance of livestock as an enterprise lies in its function as an insurance savings and not cash profit. Livestock as an insurance savings has served a useful tool for coconut farmers to educate their children and to meet their health needs. The microcredit was a useful tool in tapping unproductive labour, creating jobs and providing a minimum financial base for the poor and disadvantaged. Provision of veterinary training and services is essential for the success of smallholder livestock keeping. The study needs further extension and replication in other coconut growing communities.

ACKNOWLEDGEMENT:

We gratefully acknowledge the technical and training support from the International Coconut Genetic Resources Network (COGENT). The project was sponsored by the International Fund for Agriculture Development (IFAD). We owe thanks to Dr Pons, former Coordinator of COGENT, who directly and indirectly provided valuable concepts and information for use in the study.

REFERENCES:

- Beck, T. (1994). The experience of poverty fighting for respect and resources in village India. London. Immediate technology.
- Catley, A (1997). Non-Governmental Organizations and the delivery of animal health services in developing countries. Report for DFID. Edinburgh: Vetwork

De Haan, C. (1995). Development support and livestock services: in R. T. Wilson, S. Ehui and S. Mark (eds) (1995), pp 23-7.

Delgado, C., Rosegrant, M., Steninfeld, H., Ehui, S. and Corbois, D.C. (1999). Livestock to 2020: The next food revolution. IFPRI, FAO and ILRI.

Dery, S. K., Ghartey, N. K. T., Konto, C. D. and Ofori, F. (2001). Establishing a framework and selecting project sites for a nationwide deployment of coconut base poverty reduction interventions in coconut growing communities using COGENT 3-pronged strategies in Ghana. DFID sponsored socioeconomic survey report submitted to the International Coconut Genetic Resources Network (COGENT), May 2001.

Ghana Living Standard Survey (GLSS 1) (1997/98). In: Poverty Analysis – Ghana 2000 and Beyond: Setting the Stage for Accelerated Growth and Poverty Reduction <http://go.worldbank.org/IRRYB7CQNO>

Holden, S., Ashley S., and Bazeley, P. (1996). Delivery of Animal Health Services: Synthesis of Research Needs. Report to SFID. Crewkerne: Livestock in Development

Houterman, J. F., de Wolf, J. T., Dummer, R. M. and Litalala, E. M. (1993). Quantitative aspects of heifer in trust schemes: The Kagera experience: TSAP Proceedings, 20 (1993), pp 168-88.

Kinsey, E. (1994). Aspects of Credit in Diary Development. The HPI Tanzania Experience. TSAP Proceedings, 21 (1994), pp 58-68.

LID (1999). Livestock in Poverty–Focused Development, Crewkerne, Somerset; Livestock in Development

Moris, J. R. (1988). Oxfam’s Kenya Restocking Project. Pastoral Development Network Paper, 26c. London. ODI Agricultural Administration Unit..

Randhawa, N. S. and Sundaram, K. V. (1990). Small farmer development in Asia and the Pacific. Some lessons for strategic formulation and planning; FAO Economic and Social Development Paper 87. Rome: FAO.

Sumberg, J., and Gass, G. (1994). Mixed Farming and Livestock Development in Sub-Saharan Africa: In search of a broader perspective. Summary report to the Policy Research Initiative, ODA R-RPRRP SR. London: ODI

Thomas, D. and Rangnekar D. V. (2004). Responding to the increasing global demand for livestock products. Implications for the livelihoods of the livestock producer in developing countries. Responding to the livestock revolution. The role of globalization and implications for poverty alleviation. British Society of Animal Science. Occasional publication 33. pp.1-36

UNDP (1997). Human Development Report (1997).Oxford: OUP

Upton, M. (2004). The Role of Livestock in Economic Development and Poverty Reduction. Pro Poor Livestock Policy Initiative Working Paper 10, Rome: FAO

<http://www.fao.org/ag/pplpi.html>

Waters-Bayer, A. and Bayer, W. (1994). Planning with pastoralists: PRA and more: A review of methods focused on Africa. Vol.422. Eschborn: GTZ

World Bank Group (2008). S/Poverty Analysis-Ghana 2000 and Beyond Setting the Stage for Accelerated Growth and Poverty Reduction.htm

<http://go.worldbank.org/IRRYB7CQNO>

Appendix:

Livestock and livelihoods of coconut-based households

‘Overcoming poverty in coconut growing communities project’

Baseline survey

Site/village: ----- Date of interview: -----

Name of Respondent----- Gender ----- Occupation-----

Introduction: we would like to know about your livestock production systems in terms of the types of animals kept, the source of your stock, production system, the constraints you faced, if any, the opportunities available to you, and the benefit you expect from your livestock-keeping. I will read to you some questions about livestock keeping. Please tell me about your own experience.

Part 1: Before project situation

1. What type of livestock do you keep and why?.....
 2. How was your foundation stock established?.....
 3. What are your aspirations in relation to livestock keeping? To what extent do you achieved these aspirations?.....
 4. How do you sell your animals/animal products?.....
 6. Is there any contribution from your livestock to nutrition of your household? If yes, in what way?.....
 7. In what other ways has your livestock being beneficial to you.....
 8. Do you face any production constraints? (access to market, veterinary services and drugs, storage facilities, etc).
- Have you ever benefited from a microcredit facility?
9. In what way will microcredit be of use to you in relation to your livestock keeping?

PART 2: Project impact assessment (post project situation)

1. In which of the following ways did livestock contribute to the well-being of your household?

(List as many as applicable to you)

- i. increased cash income from sales of livestock/livestock products
- ii. improved nutrition (supply of meat protein to the household/ use of sales from livestock for the purchase of cheaper food)
- iii. Increased insurance savings (animals sold in circumstances where unexpected high cost are to be met)
- iv. use of sales from livestock for the payment of children school fees/family medical bills
- v. use of sales from livestock for purchase of input for other livelihood activities - diversify risk
- vi. Asset accumulation
- vii. Job creation
- viii. Fulfillment of socio-cultural needs
- x. Improved knowledge
- xi. Did microcredit help you fulfill your livelihood aspirations?
- xii. Could you access further loans for expansion of your livestock or other enterprises, by joining this project?