

SURVEY OF THE USE OF ORGANIC MANURE AMONG VEGETABLE FARMERS IN SELECTED DISTRICTS IN GHANA

K. Agyarko,
University of Education

W.J. Adomako
University of Education

Abstract

A study on the use of organic manure among vegetable farmers in three districts of Ghana was carried out from April 2006 to May 2006. A total of 120 vegetable farmers, 40 respondents each from the three districts were picked for the study. Questionnaire was the main instrument used for data collection. The data were analysed using the Statistical Package for Social Sciences (SPSS) version 11. Many of the farmers (75%) in all the districts together were found to apply fertilizer in their farming activities. A higher number of the fertilizer applicants, 25 (83.3%) out of 30, 20(76.9%) out of 26 and 19(55.9%) out of 34 respondents within Shama, Birim and Sissala districts respectively applied only organic fertilizer. The kind of organic fertilizer used by the farmers in the districts might be related to the availability. Respondents cited the cheapness and effectiveness of organic manure as the reasons behind their use. The bulkiness and transportation difficulties associated with organic manure were cited as the major limiting factors affecting the use of manures. Though the farmers received some education on organic manure application from mainly family members and extension agents, the education was considered not enough by them, and suggested the need to provide more education on organic manure to promote its use. The education on processing of organic manure, timing of application, placement of the manure, and the proper amount of manure to be applied should be intensified to help farmers maximise yield.

Introduction

With the ever increasing human population and urbanization, the demand for agricultural products has increased with land becoming a limiting factor. The traditional system of shifting cultivation in most developing countries is giving way to continuous system of cropping on the same land, resulting in gradual depletion of soil

fertility and crop yield. Harsh climatic conditions have also contributed to the declining soil fertility in developing countries (Henao and Baanante, 1999).

The solution to the decline in soil fertility by farmers under these conditions is the application of fertilizer, both organic and inorganic sources.

Inorganic fertilizer types are easier to use and we have more control over the content of nutrients in these sources, this allows nutrients to be applied more accurately (Bailey, 2002). Although inorganic fertilizers add necessary nutrients to the soil, their regular use causes long-term depletion of organic matter, soil compaction, and degradation of overall soil quality (Sullivan, 2004).

Organic sources are variable in their nutrient content and we have very little control over the nutrient content. However, organic sources can sometimes be obtained for little or no cost, it adds valuable organic matter to the soil and has slow release of nutrients, supply secondary and trace elements occasionally lacking in conventional farming systems that rely on primary or artificial sources of fertilizer, and have been shown to cause much less pollution than inorganic fertilizers (Tilman, 1998; Bailey, 2002).

Both types of fertilizers have advantages and disadvantages and have been used successfully by those applying them to increase the yield of crops

Farmers in Ghana use both inorganic and organic sources of fertilizer in their farming activities, the kind being use may depend on pertaining environmental or social factors. Knowing the kind of fertilizer preferred by farmers and the problems they encounter will enable solutions to be found to enhance their application.

This paper was a study on the use of organic manure among vegetable farmers in three districts in Ghana, with focus on:

1. The proportion of farmers using organic manure,

2. The kind of manure applied by farmers,
3. The problem encountered in using organic manure and
4. Sources and extent of education on the use of organic manure.

Materials and Methods

The study was carried out in three districts in Ghana, Sissala district in the northern part of the country, Shama-Ahanta East and Birim South districts in the southern section of the country (Fig. 1).

A total of one hundred and twenty (120) vegetable farmers, forty (40) respondents each from the three districts were picked for the study. Within each district ten (10) respondents each were randomly selected from randomly selected four zones.

Questionnaire was the main instrument used for data collection. The questionnaire which was built around the study objectives, were made up of both structured and unstructured questions. The instrument was reviewed three times by the authors and was pre-tested. This helped in further adjustment of the questionnaire to solicit the desired responses.

The administration and collection of questionnaire were carried out between April and May 2006. Some agricultural extension workers within the districts gave a helping hand in the administration and collection of questionnaire. Respondents were assisted in certain cases with the interpretation of question items in the questionnaire.

The data were analysed using the Statistical Package for Social Sciences (SPSS) version 11. Descriptive statistics, using both cross tabulations and figures were used to present the outcome of the research.

Fig. 1: Map of Ghana showing the Regions and the Districts of study



Results and Discussions

Most of the vegetable farmers in the three districts involved in the study were males with ages falling mostly between 26 and 55 years.

The educational levels of the farmers were found to be low. Within Shama and Birim districts in the Southern part of the country a large proportion of the respondents, 22(55.0%) and 30(75.0%) respectively had studied up to the primary or middle school level while in Sissala district in the Northern part, most [22(55.0%)] of the respondents were illiterates or have had non formal education (Fig. 2).

Though, in general the educational levels of the vegetable farmers in all the districts were low, there was a disparity between levels of education of the interviewees in the northern and southern regions as observed in Fig. 2. This is in line with the World Development Report (2006) which indicated that a higher number of men and women in the southern regions of Ghana have received *some* education while the majority of men and women in all northern regions have not received *any* education.

Fig. 2: Level of Education of Vegetable farmers

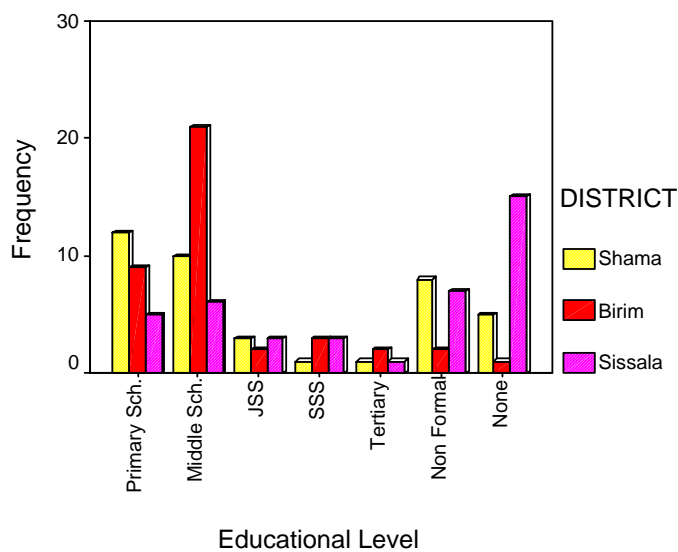


Table 1: Farmers response to whether they apply fertilizer in their farming operations or not

			DISTRICT			Total
			Shama	Birim	Sissala	
RESPONSE TO YES/NO TO THE USE OF FERTILIZER	Yes	Count	30	26	34	90
		% within FERTUSE	33.3%	28.9%	37.8%	100.0%
		% within DISTRICT	75.0%	65.0%	85.0%	75.0%
	No	Count	10	14	6	30
		% within FERTUSE	33.3%	46.7%	20.0%	100.0%
		% within DISTRICT	25.0%	35.0%	15.0%	25.0%
Total	Count	40	40	40	120	
	% within FERTUSE	33.3%	33.3%	33.3%	100.0%	
	% within DISTRICT	100.0%	100.0%	100.0%	100.0%	

Table 1, indicates the responses of farmers as whether they were using fertilizer in vegetable production or not. Seventy five percent (75.0%) of the total of 120 interviewees in all the districts together responded ‘Yes’ to the application of fertilizer

in vegetable production, an indication that most of the farmers know the importance of fertilizer application in their farming activities.

Twenty five (83.3%) out of 30, 20(76.9%) out of 26 and 19(55.9%) out of 34 respondents within Shama, Birim and Sissala districts respectively who responded 'Yes' to the use of fertilizer in vegetable production apply only organic fertilizer (Fig. 3). Farmers in the districts apply solely more organic fertilizer in vegetable production more than inorganic fertilizer or the combination of the two fertilizers. In similar studies vegetable farmers were also found to apply more organic fertilizers than inorganic fertilizers in Philippines (Joshi, 2001). Generally the application of inorganic fertilizers is considered very low in developing countries (Reardon *et al.* 2001). The high cost of inorganic fertilizers and low levels of income of farmers might explain why farmers use more organic manure than inorganic fertilizers. This is supported by the results from Table 3, where higher proportions of 82.1%, 64.0% and 83.3% of respondents within Shama, Birim and Sissala districts respectively who apply organic fertilizer cited the cheapness and effectiveness of the fertilizer as reasons behind their usage.

A greater percentage (90.0%, 78.6% and 100% within Shama, Birim and Sissala districts respectively) of the farmers who do not even apply any kind of fertilizer at all indicated their intentions to use organic manure instead of inorganic fertilizers (Table 4) with the same reason that it is cheap to use organic fertilizers (Fig. 4)

Fig. 3: Type of fertilizer farmers applied

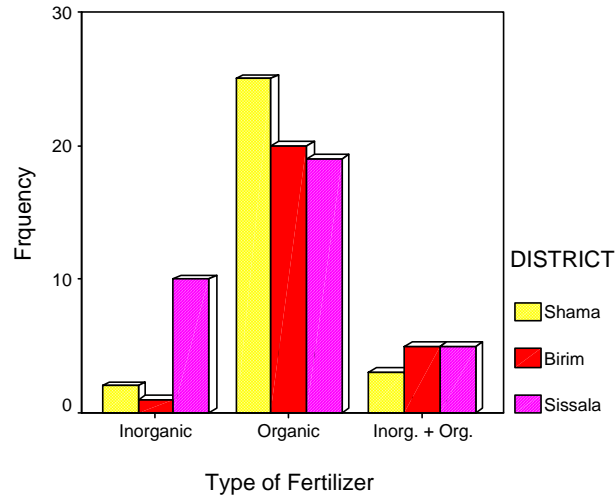


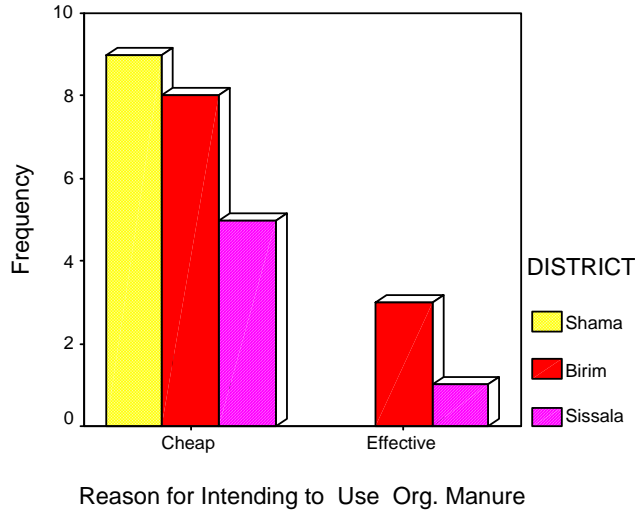
Table 3: Reasons for using organic manure

			DISTRICT			Total
			Shama	Birim	Sissala	
REASONS FOR USING ORGANIC MANURE	Cheap	Count	23	16	20	59
		% within REASONS	39.0%	27.1%	33.9%	100.0%
		% within DISTRICT	82.1%	64.0%	83.3%	76.6%
	Not Harmful	Count	5	9	4	18
		% within REASONS	27.8%	50.0%	22.2%	100.0%
		% within DISTRICT	17.9%	36.0%	16.7%	23.4%
Total	Count	28	25	24	77	
	% within REASONS	36.4%	32.5%	31.2%	100.0%	
	% within DISTRICT	100.0%	100.0%	100.0%	100.0%	

Table 4: Kind of Fertilizer Non-Fertilizer Users Intended to Use

			DISTRICT			Total
			Shama	Birim	Sissala	
KIND OF FERTILIZER	Manure	Count	9	11	6	26
		% within FERTILIZER KIND	34.6%	42.3%	23.1%	100.0%
		% within DISTRICT	90.0%	78.6%	100.0%	86.7%
	Inorganic	Count	1	3	.00	4
		% within FERTILIZER KIND	25.0%	75.0%	.00	100.0%
		% within DISTRICT	10.0%	21.4%	.00	13.3%
Total	Count	10	14	6	30	
	% within FERTILIZER KIND	33.3%	46.7%	20.0%	100.0%	
	% within DISTRICT	100.0%	100.0%	100.0%	100.0%	

Fig. 4: Reasons for Intending to Use Manure



It is observed in Table 5 that many of the farmers, 53.6% and 72.0% within Shama and Birim districts respectively responded using more poultry manure as organic fertilizer than cow dung, pig manure or poultry manure + cow dung. More cow dung (83.3%), however, was found to be used by the vegetable farmers in the Sissala district than the other manures. Farmers might not be familiar with the combinations of manure as fertilizer for farming as only 3.6% of farmers within Shama district and none within Birim or Sissala districts responded using poultry manure + cow dung as fertilizer. The kind of organic fertilizer used by the farmers in the districts might be related to the availability, culture or the religious background of the farmers. Cattle farming is more practiced in the northern part of the country than in the southern part, and intensive poultry production is more practiced than in the northern sector of the country, and hence the observed trend in Table 5. The high Moslem population in the north of the country (World Development Report, 2006) where Sissala district is found might be the reason why no farmer responded using pig manure as fertilizer in vegetable production. Piggery production is rare among Moslem communities. No responses were received from respondent on the use of crop residues as manure, this may stem from the fact that crop residues are most of

time used as animal feed, this support the discussion made by Sandford (1989) that in sub-Saharan Africa crop residues are most of time used to feed ruminants.

Most of the farmers, 17(60.7%), 22(88.0%) and 19(79.2%) from within Shama, Birim and Sissala districts respectively responded obtaining their organic manure from other people's farms with only a few of them getting the manure from their own farms or homes (Fig. 5).

Table 5: Types of Organic Manure the Farmers Apply

			DISTRICT			Total
			Shama	Birim	Sissala	
TYPE OF ORGANIC MANURE USED BY FARMERS	Poultry Manure	Count	15	18	4	37
		% within MANURE TYPE	40.5%	48.6%	10.8%	100.0%
		% within DISTRICT	53.6%	72.0%	16.7%	48.1%
	Cowdung	Count	5	6	20	31
		% within MANURE TYPE	16.1%	19.4%	64.5%	100.0%
		% within DISTRICT	17.9%	24.0%	83.3%	40.3%
	Pig Manure	Count	7	1	.00	8
		% within MANURE TYPE	87.5%	12.5%	.00	100.0%
		% within DISTRICT	25.0%	4.0%	.00	10.4%
	Poultry Manure + Cowdung	Count	1	.00	.00	1
		% within MANURE TYPE	100.0%	.00	.00	100.0%
		% within DISTRICT	3.6%	.00	.00	1.3%
Total	Count	28	25	24	77	
	% within MANURE TYPE	36.4%	32.5%	31.2%	100.0%	
	% within DISTRICT	100.0%	100.0%	100.0%	100.0%	

Fig. 5: Sources of Acquisition of Organic Manure

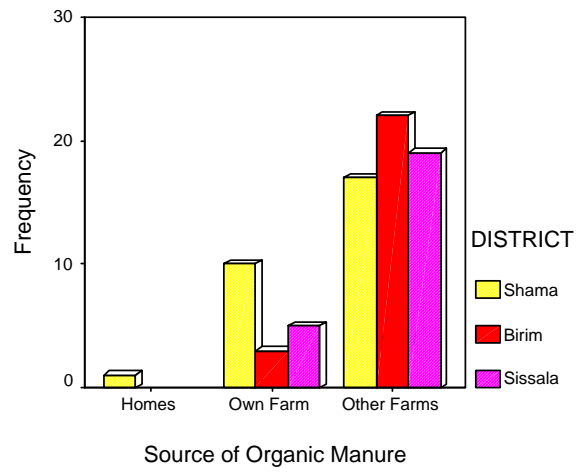


Table 6: Problems Associated with the Use of Organic Manure

			DISTRICT			Total
			Shama	Birim	Sissala	
PROBLEMS ASSOCIATED WITH USE OF ORGANIC MANURE	Damage plants	Count	4	4	.00	8
		% within PROBLEMS	50.0%	50.0%	.00	100.0%
		% within DISTRICT	14.3%	16.0%	.00	10.4%
	Bulky & Difficult to Transport	Count	9	14	14	37
		% within PROBLEMS	24.3%	37.8%	37.8%	100.0%
		% within DISTRICT	32.1%	56.0%	58.3%	48.1%
	Not Abundant	Count	1	1	3	5
		% within PROBLEMS	20.0%	20.0%	60.0%	100.0%
		% within DISTRICT	3.6%	4.0%	12.5%	6.5%
	Attract Insects	Count	6	.00	.00	6
		% within PROBLEMS	100.0%	.00	.00	100.0%
		% within DISTRICT	21.4%	.00	.00	7.8%
	Have Repulsive Odour	Count	6	1	.00	7
		% within PROBLEMS	85.7%	14.3%	.00	100.0%
		% within DISTRICT	21.4%	4.0%	.00	9.1%
	Enhance Weed Growth	Count	2	5	7	14
		% within PROBLEMS	14.3%	35.7%	50.0%	100.0%
		% within DISTRICT	7.1%	20.0%	29.2%	18.2%
	Total	Count	28	25	24	77
		% within PROBLEMS	36.4%	32.5%	31.2%	100.0%
		% within DISTRICT	100.0%	100.0%	100.0%	100.0%

The problems associated with the use of organic fertilizer as revealed by the farmers are portrayed in Table 6. Problems mentioned by respondents included, damage to crops, non availability of organic fertilizers, attraction of insects by the fertilizers, enhancement of weed growth and the bulkiness and the associated problem of transporting the fertilizer from source to the point of application. The major conspicuous problem within the districts was the bulkiness and the associated problem of transportation (32.1%, 56.0% and 58.3% responses within Shama, Birim and Sissala respectively). The bulkiness and transportation difficulties associated with the use of organic manure can be a serious limitation to the widespread recommendation of the use of organic manure. Kihanda (1998) found these same factors as barriers regarding the use of organic sources of fertilizers.

The main sources of Education on the use of organic fertilizes were found to be family members (51.7% and 56.3% responses within Shama and Birim districts respectively) and extension agents (42.3% within Sissala district) (Table 7).

NGOs and extension agents were found to contribute more to the education on organic fertilizer use in Sissala district than the other two districts. This may be assigned to the reason that, international donors and NGOs have been extremely active in northern Ghana over the past 20 years, the north has become a focus for development, and international NGOs and the government have relied substantially on aid to bridge the inequalities between the northern and southern parts of the country (World Development Report, 2006).

The immediate advice on farming practices is obtained from family members who are close associates of farmers, and it is therefore not surprising to see most of the education on organic manure use coming from family members. If a family member has the right education on manure use then the others stand to benefit.

Table 7: Source of Education on Organic Manure Use

			DISTRICT			Total
			Shama	Birim	Sissala	
SOURCE OF EDUCATION FOR ORGANIC MANURE USAGE	Extension Agents	Count	9	11	11	31
		% within SOURCE	29.0%	35.5%	35.5%	100.0%
		% within DISTRICT	31.0%	34.4%	42.3%	35.6%
	Family	Count	15	18	8	41
		% within SOURCE	36.6%	43.9%	19.5%	100.0%
		% within DISTRICT	51.7%	56.3%	30.8%	47.1%
	NGO	Count	5	3	6	14
		% within SOURCE	35.7%	21.4%	42.9%	100.0%
		% within DISTRICT	17.2%	9.4%	23.1%	16.1%
	NGO & Extension Agent:	Count	.00	.00	1	1
		% within SOURCE	00.0%	00.0%	100.0%	100.0%
		% within DISTRICT	.00	.00	3.8%	1.1%
Total	Count	29	32	26	87	
	% within SOURCE	33.3%	36.8%	29.9%	100.0%	
	% within DISTRICT	100.0%	100.0%	100.0%	100.0%	

The farmers responded, ‘No’ [23(79.3%) out of 29, 24(75.0%) out of 32 and 22(84.6%) out of 26 respondents within Shama, Birim and Sissala districts respectively] to the question of whether the education received on organic fertilizer use was sufficient or not (Fig. 6).

Respondents from all the districts were of the view that the provision of more education on the use of organic fertilizers will promote their usage among the farmers (Fig. 7).

Fig. 6: Response to the Sufficiency of Education on Organic Manure Use

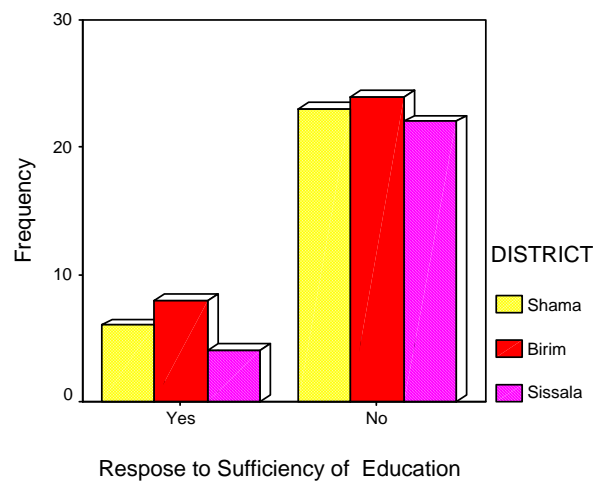
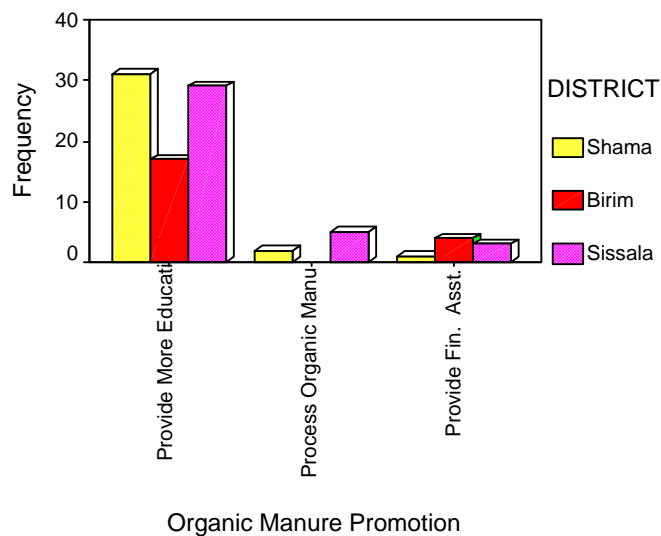


Fig. 7: Views from Respondents on the Promotion of Organic Manure Use



Conclusions

- A higher proportion of the interviewed vegetable farmers in the three districts studied in Ghana used fertilizer in their farming operations.
- Organic manures not processed in any form were found to be more applied than inorganic fertilizers, and respondents pointed to the cheapness of organic manure as the reason for using them instead of the inorganic fertilizers.
- Many of the farmers obtained their manure source from other farmers' animal farms, and that the kind of manure used seemed to bear relationship with the predominant animal farming in a particular district.
- The bulkiness and the associated difficulty in transporting manure from source to the point of application came out as the major problem hindering the use of organic manure by the farmers.
- The interest to use organic manure was high as farmers who did not even apply any kind of fertilizer intended to apply organic manure to their crops.
- Though the farmers were found to receive some kind of education on organic manure use from mainly family members and extension agents the education was considered not enough by them, and suggested the need to provide more education on organic manure to promote its use.
- Efforts should therefore be made by the Ghana government and by the nations where organic manure is highly applied to intensify education among farmers on the proper use of organic manure. Education on processing of organic manure, timing of application, placement of the manure, and the proper amount of manure to be used would help farmers to maximise yield and eventually boost the economies of nations.

References

- Henao, J. and Baanante, C. (1999) *Nutrient depletion in agricultural soils of Africa*. 2020 Vision Brief 62. Washington, D.C. IFPRI.
- World Development Report (2006) *Bridging the north south divide in Ghana*. http://siteresources.worldbank.org/INTWDR2006/Resources/477383-1118673432908/Bridging_the_North_South_Divide_in_Ghana.pdf
- Sullivan, P. (2004) "Sustainable Soil Management: Soil Systems Guide." ATTRA National Sustainable Agriculture Information Service. National Center for Appropriate Technology (NCAT). May 2004. <http://attra.ncat.org/attra-pub/PDF/soilmgmt.pdf>
- Tilman, D. (1998) The Greening of the Green Revolution. *Nature*. Vol. 396. November 19, 211-212.
- Bailey, K. (2002) *Fertilizer Zone*. NC State University, Cooperative Extension. <http://ces.state.nc.us/cumberland/fertpage/fertbasics.html>
- Joshi, R. C., Baucas, N. S., Verzola, E. A. and Catudan, B. M. (2001) Summary of a baseline survey on knowledge, perceptions and practices of vegetable farmers in Benguet, Philippines with special reference to potato leafminer flies (*Liriomyza* spp.). Global Potato News. <http://www.potatonews.com/default.asp>
- Reardon, T., Barrett, C. B., Kelly, V. and Savadogo, K. (2001) Sustainable versus unsustainable agricultural intensification in Africa: Focus on policy reforms and market conditions. Pages 365-382 In D. R. Lee, and C. B. Barrett editors. Tradeoffs or Synergies?: Agricultural Intensification, Economic Development and the Environment. CABI Publishing, Wallingford, UK.
- Kihanda, F.M. (1998) *Improvement of FYM quality through composing with high quality organic residues*. Research proposal funded by the African Science Career Awards of the Rockefeller Foundation (1998-1999). KARI, Nairobi, Kenya.
- Sandford, S.G. (1989) *Crop residue/livestock relationships*. In: Soil, Crop and Water Management in the Sudano-Sahelian Zone." Proceedings of an international workshop, January 11-16, 1987. ICRISAT Sahelian Center, Niamey, Niger. ICRISAT, Patancheru. 169-182.