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Utilization of Crop – Livestock Production Systems for Sustainable Agriculture in Oyo State, Nigeria

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ABSTRACT The study examined the utilization of crop-livestock production systems in Iseyin Local Government area of Oyo State. Sixty agro-pastoralists were purposively selected. Interview guide was used to obtain information on the respondents' demographic characteristics. The study revealed that majority of the respondents (73.34 %) are within the ages of 31 – 50 years. Most of them (76.66%) had completed one form of formal education. Over (75%) of the respondents had more than 10 cattle and about half of the respondents (50.33%) had over 20 goats. The results revealed that the highest scores of utilization of crop – livestock production systems were found in Extra income through sales, sustain food and Enhancing soil fertility with scores 58, 56 and 51 respectively and mean scores of X = 1.97; X = 1.91 and X = 1.84, respectively. The most prominent constraint to crop – livestock production is prevailing infections and parasitic diseases (81.67%). The increasing interest in utilization of crop-livestock production systems should be emphasized because of its beneficial uses.

INTRODUCTION

Ruminant livestock production in Nigeria is based predominantly on native grassland; the nutritive value of the natural pasture varies drastically according to season (Adu et al., 1998). However, mixed farming systems produce a bigger range of products, reduce risks and can be more productive than systems that rely exclusively on either crops or animals.

One key advantage of crop-livestock production systems is that livestock can be fed on crop residues and other products that would otherwise pose a major waste disposal problem. For example, livestock can be fed on straw, damaged fruits, grains and household wastes (Fakoya, 2002).

Integration of livestock and crop allow nutrients to be recycled more effectively on the farm. Manure itself is a valuable fertilizer containing 8 kg of nitrogen, 4kg of phosphorus and 16 kg of potassium to the tone (FAO, 1999). Adding manure to the soil not only fertilizes it but also improved its structures and water retention capacity (ILCA, 1988).

FAO (1996) opined that where livestock are used to graze, the vegetation under plantations of coconut, oil palm and rubber, as in Malaysia, the cost of weed control can be dramatically reduced, sometimes by as much as 40 percent. In Colombia sheep are sometimes used to control weeds in sugarcane. Draught animal power is widely used for cultivation, transportation, water lifting and powering food processing equipment. Using draught animal reduces the need for foreign exchange to buy expensive tractors and fuel (Jahnke, 1992). According to International food security treat campaign (1984) it was estimated that 52 percent of the cultivated area in developing countries excluding China is farmed exclusively with draught animal, animal traction, bringing heavy but potentially very productive soil into production.

According to FAO (1997) cow dung is highly valued for used for cooking and heating in many countries. Alternatively, 25kg of fresh cow dung makes on cubic metre of biogas, which can be used to provide energy for light, heat or motive power.

MATERIALS AND METHODS

The target population of the study was agro-pastoralist in the different villages of Iseyin Local Government area of Oyo State where Fulani cattle rearers exist. The major villages in Iseyin Local Government Area include Abidogun, Ado – Awaye, Igboja Komu, Okaka, Osogun and Yero. Purposive sampling method was used in selecting sixty respondents. Interview guide was used in obtaining information on the respondents demographic characteristics while the extent of

crop-livestock utilization for sustainable agriculture were operationalized on 3 point scale; Always utilized = 3 Occasionally utilized = 2 and Do not utilize = 1. The utilization of crop-livestock production activities scores was obtained. The mean score was set at 2.00.

(X = 3+2+1 = 6/3 = 2.00). Both descriptive and inferential statistics were used in analyzing the data.

RESULTS AND DISCUSSION

Table 1 indicates that majority of the respondents are between ages of 31.50 years and are more involved in crop-livestock integration. This can be attributed to the fact that people are more energetic during this period. It was also shown that a high proportion of the farmers (76.66%) had no formal education while some had Koran education. On the general consideration, however, the level of education of the respondents would be described as very low. Being illiterate discourage the farmers to obtain useful information and new ideas on crop-livestock integration. Over (70%) of them had settled in the area for over 5 years. Generally, cattle and Goat were kept as major livestock farm enterprises. Table 1 also reveals that about 75% of them kept more than 10 cattle Andover half (53.33 percent) kept more than 20 Goats.

Table 2 shows that the highest scores of utilization of crop-livestock production systems were found in Extra income through sales, sustain food production and Enhancing soil fertility with scores 58.56 and 51 respectively and mean scores X = 1.97; X = 1.91; X -= 84 respectively. While utilization of crop-livestock production systems for, forage linkage. Breeding services and waste disposal have lowest scores of 23.21 and 19 respectively and mean score X = 1.31; X = 1.28 and X = 1.26, respectively. Most farmers didn't utilize livestock for Breading services and waste disposal due to technicalities involved in animal breeding. The increasing interest in utilization of crop-livestock production systems should be emphasized because at its beneficial uses.

Table 3 shows that there was significant

Table 1: Demographic characteristics of respondents

Variables	*Categories*	*Frequency*	*Percentage*
Age	20-30	12	20
	31-40	25	41.67
	41-50	19	31.67
	51-60	3	5
	>60	1	1.66
Educational Level	No formal	14	23.34
	Koranic	38	63.34
	Primary	6	10
	Secondary	2	3.33
	Tertiary	-	-
Years of settlement	<5	17	28.33
	10-Jun	18	30
	15-Nov	21	35
	>16	4	6.67
Place of Origin	Katisna	32	53.33
	Kano	12	20
	Kaduna	16	26.67
Herd size (cattle)	<10 cattle	14	23.33
	10-30 cattle	28	46.67
	31-50 cattle	11	18.33
	>50 cattle	7	11.67
Herd size (Goat/Sheep	1-20 goat	28	46.67
	21-50 goat	24	40
	51-80 goat	6	10
	>80 goat	2	3.33

Table 2: Operational features of utilization of crop-livestock production systems for sustainable agriculture

S. No.	*Utilization of crop-livestock production systems*	*Frequency*	*Percent*	*Mean*	*Rank*
1.	For extra income through sales	58	96.67	1.97	1st
2.	Sustain food production	56	93.33	1.91	2nd
3.	Enhancing soil fertility	51	85	1.84	3rd
4.	Meat and milk production	50	83.33	1.8	4th
5.	Transportation of farm produce	47	78.33	1.77	5th
6.	Manure linkage	45	75	1.7	6th
7.	Draught power	34	56.66	1.52	7th
8.	Reduces risk associated with crops when used in mixed farming	29	48.33	1.49	8th
9.	Control/combat erosion	26	43.33	1.44	9th
10.	For weed control	24	40	1.32	10th
11.	Forage linkage	23	38.33	1.31	11th
12.	Breeding services	21	35	1.28	12th
13.	Waste disposal	19	31.66	1.26	13th

Table 3: Chi-squares analysis of utilization of crop-livestock production systems for sustainable agriculture and demographic characteristics

Variables	χ^2 *Calculated*	X^3 *Tabulated*	*DF*	*Contingency Coefficient*	*Decision*
Educational level	11.74	6.14	6	0.19	S
Place of Origin	4.84	10.71	4	0.12	NS

relationship between the educational level and utilization of crop livestock production systems. This implies that the level of education of the respondents influenced their utilization of crop-livestock production systems. This gives them more opportunity to obtain new ideas and information on crop-livestock integration.

Table 4 shows that there were significant relationship between age ($r = -0.16$, $P < 0.05$); herd size ($r = 0.10$, $P < 0.05$) and utilization of crop-livestock production systems. The implication is that as age increases. Utilization of crop-livestock integration decreases while increase in herd size leads to increase in utilization of crop-livestock integration.

Table 4: Correlation analysis of respondents' demographic characteristics and utilization of crop-livestock production systems for sustainable agriculture.

Variables	*r*	*P*	*Decision*
Age	-0.16	0.012	S
Year of settlement	0.14	0.06	NS
Herd size	0.10	0.002	S

Table 5 reveals that the most prominent constraint to crop-livestock production is prevailing infections and parasitic disease (81.67 percent) and exposure of animal to ticks and biting insects (76.67 percent). The implication is that animal population tends to be adapted to the local diseases in the areas in which they have lived for many generations especially as long as they are kept under traditional extensive management. Hence favorable to extensive disease transmission.

CONCLUSION

This study concluded that the respondents utilized crop-livestock production systems and the level of utilization of crop-livestock were found in the Extra income through sales (96.67 percent, sustain food production (93.33 percent and Enhancing soil fertility (85.00 percent). Intimate integration of crop with livestock help to exploiting the by products and residues from crop. Therefore, the study recommended that a lot of extension attention is however required to educate farmers on utilization of crop-livestock production systems.

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Table 5: Constraints to utilization of crop-livestock production systems

S. No.	*Variables*	*r*	*P*	*Decision*
1	Problem of theft of animal after grazing in field	39	60.00	4th
2.	Exposure of animal to ticks and biting insects	46	76.67	2nd
3.	Prevailing infections and parasitic diseases	49	81.67	1st
4.	Debarking and overgrazing of trees by animals	35	58.33	5th
5.	Lost of required fencing	40	66.67	3rd