

Original Research Article

Perceived effect of livestock waste on wellbeing of farm workers and residents within farm catchment area in Oyo State, Nigeria

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Abstract

The attempt to improve protein consumption among Nigerians through increase in livestock production has led to an upward trend in the quantity of waste generated in recent years. In this study we examined the perceived effect of livestock waste on the wellbeing of farm workers and residents within farm catchment area in Oyo State. A multistage sampling technique was used to select 148 respondents for the study. Data were obtained using a structured interview schedule and analysed using descriptive statistics, namely frequency, percentages and *t*-test. The data revealed that 34.5% of respondents fell in the age range of 21–30 years. Most (68.9%) of them were males and 56.8% had tertiary education. Majority (56.1%) had a poultry flock size ranging from 1,001 to 10,000 birds, 67% had piggery herd size ranging between 101 and 500 with 57.3% of livestock farms situated within farm settlements. The respondents generated more of cracked eggs, manure and litters as wastes. Forty-seven percent of the respondents utilised disinfection and 40.0% used treatment of feeds as the major waste management practices whereas biomass production was least used (5%). Closing of windows early was the major indicated coping strategy for disturbances from waste. Significant difference exists between residents' and farm workers' perception of livestock wastes on their wellbeing in the study area ($t = 3.693, P = 0.000$). Farm workers and residents perceived the effect of livestock waste on their wellbeing to be low. Wellbeing of residents was more affected with livestock waste than that of workers. There is a need to formulate rules and regulations governing safe handling of waste in order to minimise its impact on the wellbeing of citizens.

Keywords: animal; composting; diet; disinfection; environment; hazard; health; manure; pollution; protein.

INTRODUCTION

It has been established from research that the *per caput* protein intake in developing countries, Nigeria inclusive is comparatively low (Abdulraheem et al., 2016), which can be traced to total protein supply deficient and too much intake of carbohydrates consumed mainly in the form of starch. However, this scenario led to increase in the population of livestock being raised and confined within a relatively small land area. Consequently, quantity of livestock waste generated and accumulated has assumed an upward trend in recent years (Costantini et al., 2007). Animal wastes also include livestock and poultry manure, bedding and litters, waste water, dead animals, feedlot runoff and also wasted feed (Ajayi, 2008; Iheke, 2016). Wastes generated from livestock are known to be a valuable asset for agriculture, serving as a supplement to or partial substitute for commercial fertilizers. They

also contain detrimental organic solids, trace heavy metals, salts, bacteria, viruses, other microorganisms and sediments.

In livestock production, poultry occupies a prominent position in providing animal protein as it accounts for 25% of local meat production in Nigeria (Wilson et al., 2018). Poultry production in Nigeria can be classified into extensive and intensive systems. The intensive system has two major types; urban backyard with about 200 to 2,000 birds and commercial enterprises of more than 2,000 birds. As a result of the high feed intake (*ad-libitum* feeding) in poultry birds, waste generated in the form of excreta by them are usually in large quantity (Sibbald, 1982). The pig industry in Nigeria is also an important arm of the livestock sub-sector because pigs have high fecundity, high feed conversion efficiency, early maturity, short gestation interval and relatively small space

requirement (Chauhan et al., 2016). However, issues related to the environment, human health and quality of life of people living near and working in poultry and piggery production operations should be given critical consideration for long-term growth and sustainability of these animal productions (Smit and Heederik, 2017).

In spite of the benefits of waste to agriculture in this growing economy, animal waste constitutes nuisance and unpleasant odour to the residents through waste generated from livestock production. Meanwhile, the presence of livestock in the vast majority of the world's ecosystems especially in urban areas constitutes a great hazard in which the closeness between the animals and the residence due to the animal placement in such areas can result to spread of disease in such environment. There is also evidence that many human diseases can be transmitted from livestock to people during production, processing and consumption (FAO, 2001) and major bacterial diseases include bovine tuberculosis, brucellosis and salmonellosis, along with viral diseases caused by Influenza A Virus (IAV) (Foeken, 2006). For instance, outbreaks of IAV have been reported from commercial farms in the states of Kano, Kaduna, Plateau, Katsina, Bauchi and Abuja area of Nigeria and to date four patients have been diagnosed with respiratory symptoms and a history of exposure to diseased poultry have been investigated for possible infection (WHO, 2006), so that closeness of human beings to animals in urban areas might facilitate the spread of diseases as a result of lack of waste management and it is likely to increase if necessary adjustment is not made.

Livestock wastes have also been identified as one of the major sources of groundwater pollution and to a more restricted scope, as well as water pollution. Odorous emissions are generated in intense poultry and swine production. Dust particles which originate from faeces and feed can absorb and concentrate odorants in swine facilities which can lead to respiratory and cardiovascular diseases in farm workers and neighbours. Fafioye and John-Dewole (2012) reported that in Nigeria, approximately one third of the agricultural pollutants is caused by animal waste run-off from feedlots, holding areas and pastures whereby the waste in the surface waste lead to reduction of dissolved oxygen and endangers aquatic life which in turn produces excessive algae growth therefore causing unpleasant taste and odours.

In spite of the predominance of livestock rearing in urban and rural areas in Oyo state, there seem to be little or no conscious efforts made by governments to control the emergence of poultry and piggery where a number of livestock farming enterprises have sprung up in recent years and in large numbers, constituting threat to the environment and health of humans (Adeschinwa et al, 2003; Fadairo and Ajayi, 2016). It is also not clear why residence continue to allow livestock rearing

practices within the neighbourhood. The question of how residents around these farms perceive the wastes generated by these livestock on their well-being therefore begs for answer.

Specifically, the study looked into the personal characteristics of respondents, farm characteristics, types of waste generated, types of waste management practices used, strategies being used by residents within farm catchment areas to cope with disturbances from livestock waste, perceived effect of livestock wastes on the wellbeing of residents and farm workers. Our working hypothesis was that there is no significant difference between resident's and farm workers' perception of livestock wastes on their wellbeing in the study area.

MATERIALS AND METHODS

The study was carried out in Oyo State which is one of the 36 States in Nigeria. It is an inland state in South-western Nigeria which has its capital at Ibadan. It is bounded in the north by Kwara State, in the south by Ogun State, in the east by Osun State, and in the west by partly Ogun State and partly by Republic of Benin. There are 33 Local Government Areas in the State. The dry season lasts from November to March while the wet season starts from April and ends in October. Oyo State is located between Latitude 7°2' and 9°1' North of Equator and between longitude 2°5' and 4°3' east of the Greenwich Meridian. The population of the study comprised of farm workers and residents within selected farm catchment areas in Oyo State.

Multistage sampling procedure was used to select respondents for this study. At the first stage, purposive sampling was used to select Ogbomosho South, Ido, Lagelu and Ibadan Southwest areas of Oyo state based on the concentration of livestock farms in these areas. The second stage involved the use of snowball sampling technique to get livestock farms within these areas and simple random sampling was used to select representative proportion of the farm workers from Ogbomoso South, Ido, Lagelu and Ibadan Southwest to give a sample size of 68 while accidental sampling procedure was used to select eighty (80) residents from the radius of less than 100 m, between 101 and 200 m and beyond 200 m from each of the selected farm centre given a total sample size of 148 respondents for the study.

The respondents were asked to tick the types of livestock waste they generate in their farms using a 3 point scale of always, occasionally and not at all options for a list of possible wastes from livestock farms. Scores of 2, 1 and 0 were awarded to the options, respectively. The mean values of each of the livestock waste were generated in order to know the extent of generation of each of the waste type from farms.

Table 1. Distribution of respondents by personal characteristics [n = 148]

Variables	Frequency	Percentage	Mean
Age (years)			33.26
≤20	30	20.3	
21–30	51	34.5	
31–40	27	18.2	
41–50	22	14.9	
51–60	12	8.1	
>60	6	4.1	
Sex			
Male	102	68.9	
Female	46	31.1	
Marital status			
Single	71	48.0	
Married	77	52.0	
Religion			
Christianity	96	64.9	
Islam	47	31.8	
Traditional	5	3.4	
Educational level			
Primary education	6	4.1	
Secondary education	53	35.8	
Adult education	5	3.4	
Tertiary education	84	56.8	
Household size			3.51
1–2	67	45.3	
3–5	38	25.7	
6–8	41	27.7	
9–10	2	1.4	
Occupation			
Civil servant	29	19.6	
Trading	12	8.1	
Vocational jobs	10	6.8	
Livestock farming	55	37.2	
Self-employed	15	10.1	
Others	27	18.2	

The respondents were asked to tick the types of waste management practices engaged by each farm and the frequency of use of the practices. This was measured using a 3 point scale of always, sometimes, and never. Scores of 2, 1 and 0 were awarded to the options, respectively. The mean values computed for each management practices were used to present the practices in their order of use.

Respondents were asked to indicate the strategies used to cope with disturbances from the livestock waste using a three point scale of regularly, occasionally and never. Scores of 2, 1 and 0 were awarded to the options, respectively. The mean values computed from the strategies were used to rank them in order of importance.

The dependent variable for this study is perceived effect of livestock waste on the respondent's wellbeing. The wellbeing considered were divided into three variables which include: social, environmental and health well-being. This was operationalised using a five point Likert-type scale of Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD) for social and environmental well-being while the health problems were operationalised by asking respondents how often they experiences some disease using once in 3 months, once in 6 months, once in a year, once in several years and never. Scores of 5, 4, 3, 2 and 1 were awarded to positive statements and the reverse to negative statements. The variables were categorised into scores of high and low to determine how these diseases affect the wellbeing of

Table 2. Distribution of respondents by farm characteristics of farm workers

Variables	Frequency	Percentage	Mean
Poultry flock size			14505.26
Less than or equal 1,000	5	8.8	
1,001–10,000	32	56.1	
10,001–20,000	7	12.3	
Greater than 30,000	13	22.8	
Piggery flock size			370.78
100–300	10	43.5	
301–500	10	43.5	
501–700	2	8.7	
Greater than 900	1	4.3	
Years of livestock experience			12.82
1–10	39	58.2	
11–20	15	22.4	
21–30	6	8.9	
31 and above	7	10.5	
Farm location			
Farm settlement	39	57.3	
Industrial area	18	26.5	
Residential area	11	16.2	
Land acquisition			
Rented/leased	21	31.3	
Purchased	22	32.9	
Government	24	35.8	
Types of livestock			
Fowl	3	3.1	
Turkey	2	2.1	
Guinea fowl	4	4.2	
Broilers	24	25.0	
Layers	40	41.7	
Pigs	23	23.9	

RESULTS

the respondents. Data were analysed using descriptive statistics such as frequencies, percentages, means and inferential statistics: independence sample *t*-test. The independent sample *t*-test was considered relevant in this study since each of the two samples (farm workers and residents in farm catchment areas) involved have no bearing on each other. Therefore, in order to test the difference between these two samples with respect to their perceived wellbeing scores, the independent sample *t*-test is considered most appropriate. Statistical Package for the Social Sciences (SPSS) software was used to analyse the data. The mathematical procedures used for the *t*-test analysis by the software is as stated in the Statistical Tools for High-throughout Data Analysis (STHDA) (2019).

Statistical Package for the Social Sciences (SPSS) was used to analyse the data.

Table 1 reveals that the mean age of respondents is 33.2 years. The table also shows that 68.9% of the respondents were male. Furthermore, 52.0% of the respondents were married whereas 48.0% were single. Table 1 also shows that most (64.9%) of the respondents were Christians and 31.8% were Muslims. About 56% of the respondents had tertiary education, 35.8% had secondary education and 4.1% had primary education. The mean household size of the respondents as shown in Table 1 is 3.5 persons. The study further reveals that respondents' occupations were livestock farming (37.2%), 19.6% were civil servants and 8.1% were traders.

Table 2 shows that 56.1% had flock size of between 1,001–10,000 birds and 34.1% had flock size above 10,000 birds. On the other hand, about 87.0% of the piggery farmers had less or equal to 500 pigs in

Table 3. Types of waste generated by respondents

Types of waste generated	Always		Occasionally		Not at all		Mean	SD
	f	%	f	%	f	%		
Cracked egg/ spoilt eggs	51	34.5	12	8.1	12	8.1	1.52	0.76
Manure	82	55.4	49	33.1	17	11.5	1.44	0.69
Litters	65	43.9	50	33.8	33	22.3	1.22	0.79
Decomposed litters [undergoing decay]	57	38.5	60	40.5	31	20.9	1.18	0.75
Biologics [syringe, gloves, drugs]	48	32.4	66	41.9	59	39.9	1.09	0.74
Mouldy feeds	36	24.3	72	48.6	40	27.0	0.97	0.72
Compost piles [undergoing fermentation]	40	27.0	61	41.2	47	31.8	0.95	0.77
Dungs	53	35.8	30	20.3	65	43.9	0.92	0.89
Damp hay store	42	28.4	46	31.1	60	40.5	0.87	0.82
Contaminated beddings	28	18.9	64	43.2	56	37.	0.81	0.73
Mortalities/carcass	27	18.2	62	41.9	59	39.9	0.78	0.73
Hatchery wastes	36	24.3	41	27.7	71	48.0	0.76	0.82
Discharge	34	23.0	39	26.4	75	50.7	0.72	0.82
Decomposed urine	24	16.2	32	21.6	92	62.2	0.54	0.76
Cassava waste	30	20.3	21	14.2	97	65.5	0.54	0.81
Contaminated offal	12	8.1	36	24.3	100	67.6	0.41	0.64
Feedlot	14	9.5	29	19.6	105	70.9	0.39	0.65

SD (Standard Deviation), f = frequency

Table 4. Types of waste management practices

Types of waste management practices	Always		Sometimes		Never		Mean	SD
	f	%	f	%	f	%		
Disinfection	47	31.8	18	12.2	3	2.0	1.22	1.38
Treatment of feeds	40	27.0	22	14.9	6	4.1	1.15	1.33
Water flushing	37	25.0	15	10.1	16	10.8	1.06	1.28
Dumping	34	28.0	19	12.8	15	10.1	1.05	1.26
Re-use	32	21.6	18	12.2	18	12.2	1.01	1.24
Compositing organic manure	19	12.8	40	27.0	9	6.1	0.99	1.16
Land filling	20	13.5	34	23.0	14	9.5	0.96	1.15
Biomass [animal waste used as fuels]	5	3.4	10	6.8	53	35.8	0.59	0.76

SD (Standard Deviation), f = frequency

Table 5. Strategies used by residents within farm catchment areas to cope with disturbances from waste generated from farms

Coping strategies	Regularly		Occasionally		Never		Mean	SD
	f	%	f	%	f	%		
Closing of windows early	44	29.7	32	21.6	5	3.4	1.36	1.32
Deodorisation	35	23.6	37	25.0	9	6.1	1.27	1.26
Windbreak	33	22.3	40	27.0	8	5.4	1.26	1.25
Use of air freshener	27	18.2	42	28.4	12	8.1	1.20	1.19
House relocation	6	4.1	20	13.5	55	37.2	0.76	0.84

SD (Standard Deviation), f = frequency

Table 6. Categorisation of respondents based on perceived effect of livestock waste on their social well-being (Mean = 14.32)

Perceived Social impact	Scores	Frequency	Percentage
High	41-69	73	49.3
Low	21-40	75	50.7

Table 7. Categorisation of respondents based on perceived effect of livestock wastes on their environmental wellbeing (Mean = 52.81)

Environmental effect	Scores	Frequency	Percentage
High	53–78	75	50.7
Low	34–52	73	49.3

Table 8. Categorisation of respondents based on perceived effect of livestock wastes on their health well-being (Mean = 14.37)

Health effect	Scores	Frequency	Percentage
High	14–40	77	52.0
Low	0–13	71	48.0

Table 9. Categorisation of respondents based on perceived effect of livestock wastes on their overall well-being (Mean = 108.50)

Effect on well-being	Scores	Frequency	Percentage
High	109–165	69	46.6
Low	65–108	79	53.4

Table 10. Independence sample test difference between resident's and farm workers perception of livestock wastes on all domains of well-being

Domains of well being	Respondents category	Mean	SD	t- value	df	P-value
Social	Residents	43.19	8.03	3.268	146	0.001
	Workers	39.12	6.93			
Environmental	Residents	55.18	9.16	3.397	146	0.001
	Workers	50.03	9.23			
Health	Residents	14.93	8.88	0.861	146	0.391
	Workers	13.72	7.99			
Overall	Residents	113.29	18.03	3.693	146	0.000
	Workers	102.87	15.94			

SD = Standard deviation, t-value = T-test value, df = degrees of freedom, P-value = probability coefficient

their farms. The findings in Table 2 on the years of livestock experience of the farmers shows that more than half (58.2%) of the farmers had less than or equal to ten years of livestock farming experience. The table also shows that 57.3% had their poultry and piggery farms located within farm settlement areas, industrial areas (26.5%) and residential areas (16.2%). The result of the distribution of respondents by land acquisition is as follows: government (35.8%), purchased (32.9%) and rented/leased (31.3%). Table 2 also indicates that layers (41.7%) and broilers (25.0%) were the mostly kept birds among the farmers. Table 3 shows that the most frequently generated wastes from the livestock farms in the study area are: cracked eggs (\bar{x} = 1.52), manure (\bar{x} = 1.44), litters (\bar{x} = 1.22), decomposed litters (\bar{x} = 1.18) and biologics (\bar{x} = 1.09) such as gloves, syringe and drugs. Wastes such as feedlot (\bar{x} = 0.39), contaminated offal (\bar{x} = 0.41), decomposed urine (\bar{x} = 0.54) and cassava waste (\bar{x} = 0.54) were the least generated on the farm. Table 4 shows that majority of the farms practice disinfection (\bar{x} = 1.22) and treatment of feeds (\bar{x} = 1.15) which happens to be the most popular practices among the respondents. Waste management practices such

as water flushing (\bar{x} = 1.06), dumping (\bar{x} = 1.05), re-use (\bar{x} = 1.01), composting organic manure (\bar{x} = 0.99) and land filling (\bar{x} = 0.96) were practice at a low level by few of the respondents whereas biomass production (\bar{x} = 0.59) was practiced at a least level which can be due to ignorance and lack of innovation. The result from Table 5 shows that most of the respondents see closing of windows early (\bar{x} = 1.36) as the best strategies in coping with disturbances from livestock farm while some other respondents often use other strategies like deodorisation (\bar{x} = 1.27), windbreak (\bar{x} = 1.26) and use of air freshener (\bar{x} = 1.20). House relocation (\bar{x} = 0.76) was the least of the strategies in coping with disturbances from the farm. Table 6 shows that 50.7% of the respondents perceived social effect of livestock wastes generated from farm around their residence as low. This indicates that livestock wastes when not properly managed can affect the social wellbeing of people living near and around farm locations. Table 7 shows that 50.7% perceived the environmental effect of livestock waste as high. Table 8 shows that 52.0% have a high health threat effect. This implies that most of the respondents perceived the effect of

livestock waste on their health to be high. Table 9 indicated that the perceived effect of livestock wastes on their wellbeing was generally low among the respondents. However, the considerable proportion of the respondents (46.6%) that indicated high impact of livestock wastes on their wellbeing suggests that challenges posed by livestock wastes to the wellbeing of residents around farm locations is considerably significant. Table 10 shows a significant difference between residents' and farm workers perception of livestock wastes effects on their social wellbeing ($t = 3.268, P = 0.001$), environmental ($t = 3.397, P = 0.001$) and overall wellbeing ($t = 3.693, P = 0.000$). This implies that there is a difference in the way farm workers and residents perceived the effects of livestock waste on their social, environmental and overall wellbeing. It was only the health wellbeing that was not significant ($t = 0.861, P = 0.391$). This may be due to the fact that health effects arising from poor waste management takes a longer time to be noticed when compared with environmental and social impacts. The mean values for social wellbeing (residents = 43.19, workers = 39.12), environmental (residents = 55.18, workers = 50.03), health (residents = 14.93, workers = 3.72) and overall wellbeing (residents = 113.29, workers = 102.87) suggests that residents were more at risk of the effects of livestock waste on their wellbeing than farm workers.

DISCUSSION

In the study respondents were sampled and compared from both urban and rural areas. This implies that intervention of increasing production of animal protein as reported by Hamid et al. (2017) is being given serious consideration in both areas as it boost income of farmers. Most of the respondents were involved in poultry production with few in piggery production. This corroborates the report of Heise et al. (2015) that poultry production has become a fulltime occupation for many Nigerians and is significantly contributing to the Gross National Product (GNP) of the nation. The result also shows that some of the respondents lived close to the farm which makes them more prone to diseases. Smit and Heederik (2017) asserted that the health of people living near livestock farms is always at stake.

The study also revealed that most of the respondents are young. Onwumere (2008) suggests that young farmers can still face the challenges of livestock enterprise despite the huge labour demand and efficiently manage waste and pollution that might spring up from lack of effective use of animal waste on the farm. Most of the respondents were male which illustrates that modern livestock production is still predominantly a male occupation and this may be as a result of the stressful nature of rearing it. Majority of the respondents were married which will make them to be emotionally stable and responsible which could contribute to labour and ideas in the growth

of the business. This is in consonance with Akinbile (2007) that the effect of marriage could enhance the release of family labour, thus making more hands available for productive activities on the farm. Also, most of the respondents involved in livestock farming in the study area were Christians with majority in poultry farming and few in pig farming. This suggests that restriction in eating pork by Muslim religion could be a reason for few respondents being involved in pig farming. The study shows that the educational level of respondents is high in the study area which corroborates the report of Oduwaiye et al. (2017) that most livestock farmers in South-western Nigeria can understand and apply technical information in the production and management of livestock farming due to their level of education. The study also revealed that the household size of respondents is relatively low which could be attributed to one of the peculiarities of urban areas where couples have control over the number of children they have as supported by Anyanwu (2013) that household size is related to either an individual lives in urban or rural areas. The study shows that respondents were involved in various livelihood activities aside livestock farming which will help to boost their income.

The study also indicates that most of the poultry farmers in the study area are medium scale producers. This is likely to affect the wellbeing of residents in terms of the waste generated if not properly managed as the number of birds produced is relatively large. The study reveals that most of the respondents were more into broiler and layer production. The results confirm the report of Idowu et al. (2005) that layers are the most frequently reared birds among poultry farmers. Pig production share is lower implying that poultry farming is more popular than raising pigs in the study area which could be attributed to religion barrier forbidding Muslims to eat pork. The years of experience of respondents is within ten years indicating that many of the farmers are relatively new in livestock business. This may have implications on their ability to manage wastes generated from farming effectively due to limited experience. Moreover, Sobogun (2012) reveals that poultry farms within farm settlement areas may have similar ways of managing their livestock waste due to proximity of farms to one another and livestock farms located in industrial estates are proactive in making adequate arrangement with appropriate technologies by using the waste effectively to stop the effect of the waste on the wellbeing of the people. Respondents acquire land from different sources based on its availability and those that are financially stable could afford to purchase land for their farm activities.

The type of waste generated on selected farms indicates that most respondents regard manure and cracked eggs as a waste which could have been used as a source of manure on the farms. The major

waste management practices in the study area were disinfection and treatment of feeds with few engaging in water flushing, dumping, re-use and composting. This implies that majority of the farmers are knowledgeable of the importance of disinfecting feeds before feeding the animals which is a major waste management practice in the study area. The results partly agree with Vide (2012) who reported that there exists less composting activities in Nigeria and thus waste management activities do not conform to the standard rules and regulations guiding the integration of waste for other production activities. This means that wastes were being left to accumulate and pose potential hazard for polluting the environment (Ogejo, 2009). Strategies used for coping with livestock waste are closing of windows early and use of deodorants with few using house relocation probably due to cost which implies that respondents needed to adjust to the environmental effect of waste especially the odour and air pollution caused by waste generation.

The study reveals that the perceived effect of livestock waste on the social wellbeing of respondents is low suggesting that respondents still interact well with farm workers despite odours and farm activities that may disturb their neighbourhood as corroborated by Sobogun (2012) that interpersonal relationship of farm workers and neighbours around their farms is cordial. On the perceived effect of livestock waste on the environment, it was perceived to be high suggesting that neighbours are aware of the negative consequences of waste on their environment. Perceived effect of livestock waste on the environment will not be porous if the waste are properly managed, disposed and used effectively for other farming activities. It is evident from the study that farm workers are at greater risk than residents. This implies that perceived effect of livestock waste on the respondents does not favour their wellbeing. Perceived effect of livestock waste on health wellbeing was high. Van-Dijk (2016) reported that living near livestock farms leads to diseases, especially respiratory health effects. The perceived effect of livestock waste on respondents' overall wellbeing was low. The study revealed clearly that residents near livestock farms are more at risk of the effects of livestock waste on their wellbeing than even the farm workers. This corroborates the report of Smit and Heederik (2017) that people living near livestock farms are more affected with the activities of managing livestock than workers in those farms. This indicates that serious action must be taken by all stakeholders to ensure that livestock farms are not located near houses and prompt disposal of waste becomes pertinent in those areas.

CONCLUSION AND RECOMMENDATIONS

The study concluded that respondents who live close to farms are more prone to diseases caused by livestock waste. Waste management practices used in the study area were not effective thereby posing adverse effect on environmental wellbeing of respondents. Perceived effect of livestock waste on social wellbeing was low; environmental and health wellbeing was high. Farm workers were more at risk of livestock waste than residents near farms. Wellbeing of residents is more affected with livestock waste than workers. Hence, there is a need to sensitise people on how to manage waste and how to put into consideration the waste management practices, especially composting. Stakeholders should be sensitized and aware of wastes implication if not used efficiently; need to formulate rules and regulations governing safe handling of wastes in order to minimise its impact on the wellbeing of citizens is pertinent. There should be facilities to take care of waste generated from farm especially for utilisation and re-use. Extension officers should organise trainings on how to utilise waste for wealth generation among livestock farm workers.

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