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Research Article

Livestock waste management practices in Oyo state, Nigeria

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Livestock waste management methods were evaluated in Oyo State where different farms were visited, structured pre-tested and peer-reviewed questionnaires were administered. The results of this study revealed that the use of animal wastes as manure for farmlands or outright dumping in the bushes, garbage sites or open lands were the most common waste disposal methods practiced by commercial poultry and livestock keepers in Oyo State. Out of all the farms sampled, 45% of the farms practiced Open lands waste disposal methods, 10% practiced sun-dried and burned animal wastes disposal methods, 14% practiced flushing wastes into nearby streams and rivers as slurry, 24% used a combination of all the three methods as space or time permits, 2% turn their waste to biogas for cooking or lightening on the farm and 5% use part of the waste as feed source for ruminants or fishes on the farm. The results showed that larger percentage of the farms does not have an environmental friendly animal waste management system and the implication is widespread air, water and land pollution.

Key words: Livestock wastes, management practices, public health, Environment, Oyo State.

INTRODUCTION

Livestock production has greatly increased in Nigeria probably due to ban on the importation of poultry products which has led to a dramatic growth of more than 10 fold rise (Ekunwa *et al* 2006) many people now see livestock production as a means to poverty alleviation, however, there are no strong plans for waste disposal from these livestock ventures. The term "solid waste" means any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations (US Law-Solid Waste Act 2, 1999). The term "disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid wastes, hazardous wastes, or any constituent thereof may enter the environment or be emitted into. The UNEPA (2006) state that wastes that are not properly managed, especially excreta and other liquids and solid wastes from households and the community, are a serious health hazard and could lead to the spread of diseases. Direct dumping of untreated wastes in rivers, seas, and lakes, result in the accumulation of toxic substances in the food chain through the plants and animals that feed on it (Medina, 2002).

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In Nigeria today, there are fewer underground drain-age system only in few cities not in most rural and semi-urban settlement where we have livestock farms situated and as a result all wastes being liquid or solid wastes find their way into water courses. In Nigeria, waste is generated at the rate of 0.43 kg/head per day and 60 to 80 per cent of it is organic in nature, as described by Sridhar, 2006 and Ogwueleka, 2009. Slaughtered animals produce various kilograms of wastes in the form of dung, bone, blood, horn and hoof. All these wastes contain a lot of valuable resources in the form of nitrogen, phosphorus, potassium and other chemicals which are useful, if being properly managed (Hammed *et al*., 2011)
Waste may be classified in many different ways, such as according to its origin (e.g. domestic, industrial, commercial, clinical, construction, nuclear, agricultural) or its properties (e.g. inert, toxic, inflammable). Without suitable treatment such waste becomes a source of contamination to the environment at large, leading to air pollution (e.g. acid rain or traffic pollution), water pollution, and oil pollution.(Encarta P, 2004) Various studies have indicated that intensive animal husbandry can lead to the accumulation of animal wastes within relatively small geographical areas (Böhm, 1995; Ekunwa *et al*., 2006) These livestock wastes, which may consist of very high levels of nitrogen, phosphorus and other toxic materials, constitute serious environmental threats, through nutrient losses from farms to the environment (Ly,1993). Some studies however portray the impact of intensive animal husbandry on the ecosystem as being largely beneficial (Acharya, 1992; Monteny *et al*., 2006), evidence of harmful effects such as the emission of methane and the release of toxic metal leachates into the surroundings of livestock operations from manure and compost abound in the farm vicinities.
The aim of the study was to identify the waste management methods used by livestock farmers in Oyo State, Nigeria.

MATERIALS AND METHODS

The study area

Oyo State is an inland state situated in the southwest geopolitical zone of Nigeria. It lies entirely in the tropics between Latitude 7.1°N and 9.2°N and Longitude 2.7°E and 4.56°E of the Greenwich Meridian, and covers a land area of about 28,454square kilometer. The state shares contiguous internal boundaries with Ogun State to the south, Kwara State to the north and Osun State to the east, while westwards it presents a common international border with the Republic of Benin and partly with Ogun State. Oyo State has been in the front race as a livestock producing community with sizeable commercial livestock farming, involving huge enterprises and many household farms, raising birds for meat and eggs, pigs for pork production and cattle. Also, hatcheries business thrived very well in the State with two days of the week being occupied for the business. There are a number of farm settlements scattered across the State to aid in the production of the livestock especially at Akufo and Lalupon. Oyo State can equally adjudged to be peaceful with cheap sources of land and labour and close proximity to the commercial capital of the country, Lagos, these may be some of the factors to be considered in the establishment of livestock farms in the state.

Data collection and analysis

Farm Visit and a structured, pre-tested and peer reviewed questionnaire were used for collecting data pertaining to farm location, stock type, stocking density, husbandry methods, and waste disposal methods, from fifty nine livestock farms, situated in seven local government areas of Oyo State. Data analysis was by the use of descriptive statistics (SPSS, 2015)

RESULTS AND DISCUSSION

Farm sizes and husbandry methods

Approximately (58%) (35) of the farms practiced mixed animal husbandry consisting of poultry, cattle, sheep and goat, swine, rabbit and fish in combination of two or more of these species mentioned , while 42% (24) reared only chickens. All the farms surveyed practiced intensive poultry, piggery, rabbit and fish husbandry but the ruminants were allowed to graze regularly. The flock size for poultry varied from 200 to 5,000 birds, the pigs population ranges from 20-500, cattle between 15 and 80, sheep and goats varied from 12 to 45, Rabbits are between 25 to120 while they can not quantify the actual number of fishes in the ponds.

Waste disposal methods

The results of this study revealed that the use of animal wastes as manure for farmlands or outright dumping in the bushes, garbage sites or open lands were the most common waste disposal methods practiced by commercial poultry and livestock keepers in Oyo State, in all 45% of the farms that were sampled disposed animal wastes in these ways. The remaining farms utilized the following methods: 10% sun-dried and burned animal wastes, 14% flushed such wastes into nearby streams or rivers as slurry while 24% used a combination of all the three methods as space or time permits, 2% turn their waste to biogas for cooking or lightening on the farm and 5% use part of the waste as feed source for ruminants or fishes on the farm. These results showed that larger percentage of the farms do not have an environmental

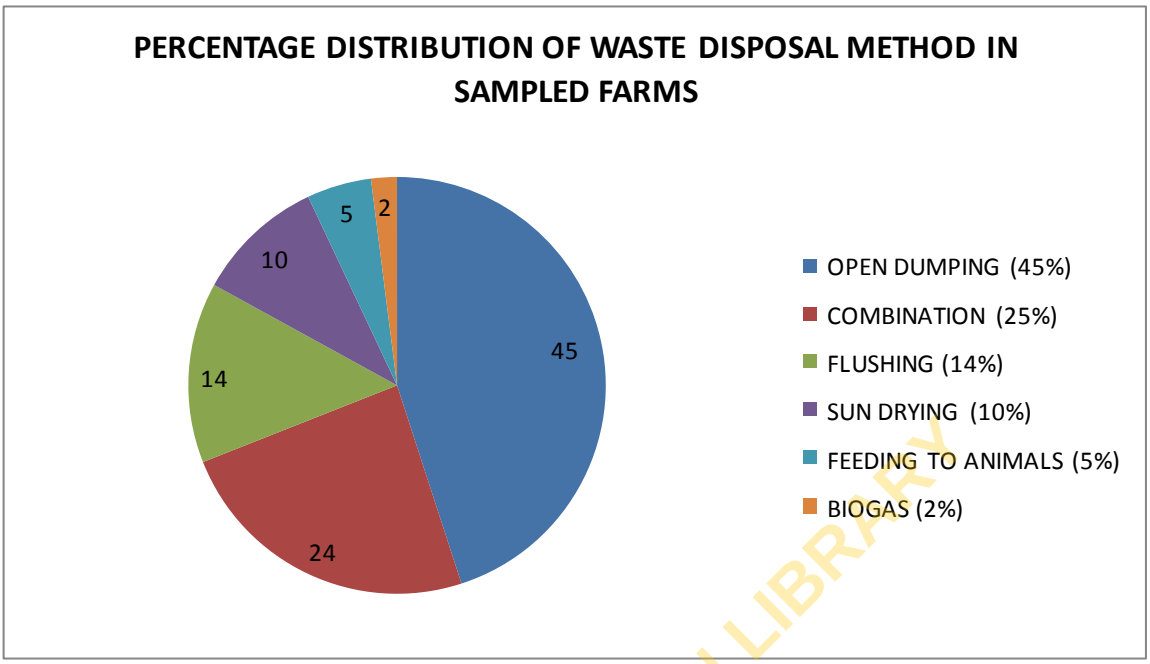

Figure 1. Distribution of waste disposal method on the sampled farms.

friendly animal waste management system with the implication of widespread air, water and land pollution. Hence, there is need for proper education for farmers to practice environmental friendly livestock farming. The mismanagement of these solid wastes as seen in this present study pose serious environmental and health problems, promote insect vectors like mosquitoes and flies, rats and mice, cause fire hazards, flooding of streams, development of aquatic weeds, odour problems, nuisance, and so on as also described by (Cairncross and Feachem, 1993).

The environmental impacts can be grouped into six classes which include: global warming, photochemical oxidant creation, abiotic resource depletion, acidification, and eutrophication. Some of these problems are related to their major constituents, viz. carbon, nitrogen, phosphorus and sulphur. Certain toxic heavy metals like lead, mercury, cadmium, minerals and manmade synthetic chemicals present in wastes may contribute to environmental degradation that leads to poor health (Pichtel, 2005).

CONCLUSIONS AND RECOMMENDATIONS

Although the study was conducted in a limited number of farms and sites, it can still be derived from the data that current waste management practices are not environmental friendly in Oyo State. The animal wastes generated by most of the surveyed farms have the potential to contribute to the pollution of land and water systems due to failure of these farms in adopting pollution mitigating methods and technologies; this is in consonance with the findings of Ayodeji *et al*. (2011) who conducted a similar study in Ogun State of Nigeria. The disposal methods in practice may bear grave implications for the environment, livestock and public health, it is therefore necessary to conduct impact assessment studies that will quantify the magnitude of these aforementioned risks to the populace. It is therefore recommended that in areas of intensive livestock production in Oyo State, waste management and associated environmental considerations should be one of the key public policy issues. There should be strict enforcement by supervisory agencies of the existing policies aimed at environmental preservation and the protection of water quality. .Approaches to livestock waste management practices, legislation, regulation and policy should be extremely dynamic at the moment because of the future. Several Environmental-friendly models should be considered as a prototype for addressing livestock waste management issues and be adopted for farmer's usage though the popular adoption of any technology would depend on cost considerations, access to subsidies, and the potentials the technology has for yielding profit. Priority must be given to educate the farmer, government resource manager and the public about livestock waste disposal.

Lastly, further research should be conducted on cheap (affordable) but efficient and environment friendly waste disposal practices that would be appropriate for livestock and poultry operations under local conditions as recorded in Oyo State especially in the area of turning waste to beneficial usage.

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