



An Appraisal of the Challenges of Poor Abattoir Waste Management

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ABSTRACT

The challenges posed by poor abattoir waste management on public food safety and quality of life in Nigeria has become a source of concern in recent times. The numerous wastes produced by abattoir operation not only pose a significant challenge to effective environmental management but also are associated with decreased air quality of the environment, potential transferable antimicrobial resistance patterns, and several infectious agents that can be pathogenic to human. Studies have also shown that poor abattoir waste disposal are responsible for the pollution of surface and underground waters as well as air quality which indirectly affect the health of residents living within the vicinity of abattoirs. Thus, this paper examined the challenges of poor abattoir waste management. It maintained that despite the availability of legislative framework on animal slaughter in the country, issues such as slaughtering animals on untidy floors, absence of stunning and ripening operations, inadequate slaughtering facilities, lack of sewage disposal systems, as well as inadequate clean water supply often characterize meat handling procedures in most abattoirs. The paper concluded that managing of abattoirs and slaughterhouses should be left entirely in the care of Local governments and private entrepreneurs nationwide, as this is in line with the Federal government of Nigeria's current position about the operations of public utilities. It further recommended among others, the need for the provision of waste disposal system such as incinerators around slaughter houses.

Keywords: Abattoir, Incinerator, Slaughter house, Waste management, Challenges

INTRODUCTION

Abattoir operations result in the generation of numerous waste and microbial organisms that pollutes the environment and pose serious threat to human health and quality of life. Sadly enough, most abattoirs in Nigeria are characterized by poor design, obsolete facilities and deteriorating environment. The challenges posed by poor abattoir waste management on public food safety and quality of life in Nigeria has become a source of concern in recent times. So many studies have been carried out on the poor state of abattoirs in developing countries (Nigeria inclusive) [1, 2]. The numerous wastes produced by abattoir operation not only pose a significant challenge to effective environmental management but also are associated with decreased air quality of the environment, potential transferable antimicrobial resistance patterns, and several infectious agents that can be pathogenic to human [1]. Abattoir waste consists mainly of bones, undigested ingest and occasionally aborted fetuses (solid waste) while the liquid wastes comprise of blood, urine, water, dissolved solids and gut contents [2]. So many studies exist in the literature which have documented a variety of contaminants, microbial agents and health effects in those occupationally or accidentally exposed to improperly managed abattoir waste [3, 4, 5, 1]. Studies have also shown that poor abattoir waste disposal are responsible for the pollution of surface and underground waters as well as air quality which indirectly affect the health of residents living within the vicinity of abattoirs [6, 7]. [8] cited in [2] observed that primary producers in affected water bodies may be destroyed by such pollutants, which may directly affect fish yield, with serious consequences on diet. Wrongful discharge of blood and animal faeces into streams may cause oxygen-depletion as well as nutrient over enrichment of the river system which could cause increased rate of toxin accumulation [9]. This paper examines the challenges of poor abattoir waste management.

Types of Slaughter Facilities in Nigeria

There seems to be adequate provision of slaughter facilities in all the states of Nigeria with the number varying as to what type of facility is available vis-a-vis its sanitary measures and manpower to manage it. This statement is based on the legal provisions by the Dasuki Commission that rolled out the Local Government Reforms in 1986 as well as the template abattoir model developed by the Federal Department of Livestock and Pest Control Services under the Ministry of Agriculture and Rural Development in the early 1990s. In the provision by the Dasuki Commission, LGCs are empowered to have the right to open and manage slaughter slabs and slaughter houses.

Furthermore, the Fourth Schedule of the 1999 Constitution of Nigeria, subsection 1(e) states, amongst others, that the main functions of the Local Government Councils in the area of agriculture will be the “establishment, maintenance and regulation of slaughterhouses, markets, motor parks and public conveniences” [10]. [1], reported that there are over 30 abattoirs, 132 slaughterhouses and 1077 slaughter slabs in Nigeria with as many or even more than 14,127,868 animals annually. They further reported that the establishment and management of abattoirs and wastes in Nigeria have always been regarded as social services by all the three tiers of government. However, as a deviance from that, many abattoirs has been turned into living quarters as [1] reported that in Oko-oba abattoir in Lagos, Nigeria, lairages where cattle are supposed to be kept overnight before slaughter have been turned into living quarters. They also reported that conveniences provided in the abattoirs for abattoir workers were dysfunctional and hoodlums found them handy for their illegal activities. The management of the Oko-oba abattoir had also allowed abattoir workers to dispose the waste from the abattoir into the nearby gutters and canal that were near to the abattoir. Such reports have been made by [11] in their study of abattoir management in North Western States of Nigeria. These studies indicated that the electrically operated rails, the floors, windows and doors had all given way with the results that these facilities never looked as slaughter facilities. The state of affairs as reported here may be due to lack of enforcement of the existing laws and regulations as observed by [12] as they found the Local Government authorities were more interested in revenue generation than the real reasons for opening slaughter facilities in their areas. Thus, [13] opined that abattoir should be publicly administered with a budget independent of the national or municipal administration as the provision of abattoir is a social service. At Zoo town in Trans-Amadi, Port Harcourt, Nigeria, the abattoir wastes were reported to be channeled directly into river Okpoka, a tributary of the Bonny River [14]. Many of the abattoirs in Nigeria have been reported to operate below the international standards owing to the absence of hanging rails, potable water, steam for washing abattoir floors after daily operations, cold rooms and automated facilities for the removal of carcasses and wastes among others. For example, in a study to determine the level of management at some abattoirs in four North Western States of Nigeria, [11] reported that there was no carcass hanging facilities in most of the abattoirs under their study. They also reported that offal’s were washed with drainage water, effluent from drainage systems and that meat and organs cleaned from such drainages were sold to the public. Similarly, [15] reported butchers and many abattoir workers not using protective clothing during operations. All these can result in the transmission and even spread of tuberculosis and other diseases, should the organisms be around. The fact that there is no sustainability and maintenance culture in the development of activities in most Nigerian public and even private sectors mean that abattoirs will not be run in the utmost states. The Public water supply is erratic while the electricity generation has gone far below 30% as, in some areas, there might be no electricity supply for months. In such a situation, one would not expect to have good working abattoir facilities even if they are functional.

Challenges of Abattoir in Nigeria

Despite availability of legislative framework on animal slaughter in the country, diverse problems such as slaughtering animals on untidy floors, absence of stunning and ripening operations, inadequate slaughtering facilities, lack of sewage disposal systems, inadequate clean water supply abound with meat handling procedures in abattoir in this case report. Other common challenges include: Lack of a refrigeration system, inadequate transport system for meat products and lack of price incentives for quality. Abattoirs are known all over the world to pollute the environment either directly or indirectly during various daily operations [3]. The numerous waste and microbial organisms obtained during abattoir operation not only pose a significant challenge to effective environmental management but also are associated with decreased quality of life of human population living close to these abattoirs [4]. Abattoir operations produce a characteristic highly organic waste with relatively high levels of suspended solid, liquid and fat. The solid waste includes condemned meat, undigested ingests, bones, horns, hairs and aborted fetuses. The liquid waste is usually composed of dissolved solids, blood, gut contents, urine and water. Animal food is always microbiologically contaminated by organisms living in it naturally or entering it from the surroundings, such as those resulting from processing operations [16]. Where abattoir effluent-polluted waters are used to grow salad crops and vegetables, transmission of infections is bound to occur because animal wastes are known to contain pathogenic organisms, causing Salmonellosis, Leptospirosis, Tularemia, Foot and mouth disease and many more [17]. Abattoir activities and management have direct and indirect effects on the built-up environment and health of people especially residents in abattoir vicinity. There is a negative impact of abattoir activities on air and water qualities of surrounding residential areas; especially where effective waste disposal system is not practiced. Very poor meat inspection facilities and uncooperative attitude of butchers have also been reported in Nigerian abattoirs [18]. Environmental problems have increased with improper management practices being largely responsible for the gross pollution of the aquatic environment with parallel increase in water borne diseases especially typhoid, diarrhoea and dysentery. A German study reported

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that blood, one of the major dissolved pollutants in slaughterhouse wastewater, has a chemical oxygen demand (COD) of 375,000mg/L [19]. This impacts high organic pollutants on receiving waters consequently creating high competition for oxygen within the ecosystem. While the slaughtering of animals result in meat supply and useful by-products like leather and skin, livestock waste spills can introduce enteric pathogens and excess nutrients into surface waters and can also contaminate ground waters [20].

Environmental Consequences of Poor Abattoir Waste Management

Abattoirs are one of the industries that contribute to the problem of possible food-borne diseases and potential health hazards associated with food, especially meat in developing countries like Nigeria [21]. Abattoir waste affect air quality, agriculture, potable water supplies, and aquatic life. These all pose risks to human health [21]. The common disease causing organisms have been reported by researchers in slaughtered animals and abattoir wastes in Nigeria. Heaps of abattoir waste are common sight in most abattoirs in Nigeria as well as the study area which constitute serious environmental and public health hazards [22-28]. The seriousness of environmental and health problems have been reported by so many scholars who isolated species of pathogenic bacteria from the solid waste and effluents from abattoirs [29-32]. Abattoir waste has been reported to contaminate and increase the level of nitrates in ground water and cause methaemoglobinaemia [33-38]. It has also been reported that abattoir waste piled up within the environment not only caused pollution but also produced methane gas that intensifies greenhouse effect [39-42]. The waste could be washed away by surface runoff to contaminate ground and surface waters including market places and streets [43-45]. Apart from been unpleasant and the stench it generates, abattoir wastes contain bacteria, high levels of ammonia and a very high Biological Oxygen Demand (BOD) which strip essential oxygen from water bodies and can cause serious harm to aquatic life and water quality [46].

Abattoir Waste Management

The abattoir waste materials are entirely organic that can either be composted or recycled and used for various activities, yet they are left to degrade, producing bad stench [2]. Degrading heaps of gut contents at the site serve as breeding grounds and sanctuary for pests that become a nuisance for abattoir workers, visitors as well as residents around the facility. Bone waste is currently not a problem because they are often sold together with the meat [2] and processed into animal feed. Although abattoir waste carries high levels of microorganisms that may be harmful to humans, they are an excellent substrate for generating biogas [28]. This study revealed that about 11,072 tons of blood, 17,280 tons of gut contents and 13,824 tons of waste tissues are generated and disposed annually. This volume of waste when properly managed (composted or digested) will in addition to reducing the sanitation and health challenges round the facility, produce other benefits (for example, manure) for farmers and biogas for home and other uses [2]. It has been estimated that 1 kg of fresh animal waste produce about 0.03 m³ of gas (methane) per day [29]. This theoretically implies that about 525,000m³ of biogas can be produced annually from the 17,280 tons of gut contents alone generated in the study area [40-46]. It is popularly believed that the potential to generate biogas from abattoir waste is a good opportunity to enhance their activities [2]. If this opportunity presented by the abattoir waste is fully harnessed in the study area, it would lead to improvements in efficiency of waste management in the area.

CONCLUSION

The managing of abattoirs and slaughterhouses should be left entirely in the care of Local governments and private entrepreneurs nationwide. This is in line with the Federal government of Nigeria current position about the operations of public utilities, also of the success of such ventures when private entrepreneurs are involved. Meat Inspection and hygiene Act shall be enacted and signed into law to allow for proper implementation and enforcement of the law by the governments and staff. This will ensure proper management of the abattoirs and efficient meat inspection and hygiene. Provision of waste disposal system such as incinerators are recommended. The drainage system should be upgraded and modernized. Awareness on the use of abattoir waste (manure) for biogas production and subsequent use of slurry thereafter as fertilizer is also recommended. Community education program should be mounted to educate the slaughter slabs workers on the zoonotic diseases commonly found in unkempt abattoir.

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