

SUB-THEME: ENVIRONMENT**Environmental and public health factors in establishing abattoirs in Botswana****A. O. Aganga**

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ABSTRACT

With the re-enactment of the Livestock and Meat Industries Act of 2007, which requires compliance with good manufacturing practices, the desire of some entrepreneurs to establish processing plants has assumed great proportions. Requirements for the selecting a suitable site of such meat processing plants are reviewed and recommendation made to cater for possible environmental and public health concerns.

Keywords: Environmental impact, public health factors, abattoirs, site selection, Botswana.

INTRODUCTION

An abattoir or slaughterhouse is a facility where animals are killed and processed into meat foods. The animals most commonly slaughtered for food are cattle for beef and veal, sheep for lamb and mutton, pigs for pork, goats for chevon, birds (chickens- turkeys, ducks and ostriches) for poultry meat: and horses for horsemeat.

Abattoirs act as the starting point of the meat industry, where stock comes from farms to enter the food chain. They have existed as long as there have been settlements too large for individuals to rear their own stock for personal consumption. They are an important industry, which play a major role in the domestic meat supply and export industry of many countries. Factors which contribute to environmental degradation include overgrazing of communal lands, depletion of woodlands for fuel wood and other uses such as extraction of river sand for construction, air pollution from factories and mining concerns as well as pollution of underground water sources from indiscriminate waste disposal. Unattended to, environmental degradation could harm long-term development, (African Development Bank, 2002). In recognition of this, the Government of Botswana has integrated environmental considerations into development programmes and policies.

The following processes take place at an abattoir: receiving and holding of livestock animal

slaughter and carcass dressing, chilling of carcass product, carcass boning and packaging, freezing of finished carcass and packaged products, rendering, salting and drying of hides and skins, treatment of wastewater and transport of processed material. These activities could lead to pollution and environmental degradation if appropriate regulatory measures are not in place for specific aspects:

Transportation

Transportation of livestock to the abattoir is usually on hoof or by road trucks but also by rail. Most of the cattle for slaughter at the Gaborone City Abattoir are trekked to the abattoir (Burrow and Binnie, 2001). The possibility of animals dying on arrival due to stress or an outbreak of infectious disease en- route to the abattoir is always there. It is therefore necessary for a mass animal disposal area to be identified close to the abattoir. Such area should be away from watercourses and groundwater. The soil should be suitably friable for digging but also as impermeable as possible.

Liquid wastes

For hygienic reasons, abattoirs use large amounts of water in animal processing operations. This produces large amounts of wastewater that must be treated. Effective primary treatment before secondary treatment will increase the overall effectiveness and efficiency of wastewater treatment systems, as it is cheaper to remove

physically the fat and solids than to treat them later in secondary and tertiary treatment facilities (Government of Western Australia, 2007)

Waste and storm water

Abattoirs pose the following contamination risks to water resources:

- nutrients from animal manure and process wastewater may lead to eutrophication in wetlands and waterways, and toxic concentrations of nitrogen compounds;
- depletion of oxygen levels in surface waters due to the breakdown of organic matter;
- increased numbers of pathogens such as salmonella from any diseased stock held at the site;
- increased salinity derived from waste stabilisation pond due to effluent evaporation;
- increased turbidity due to solids transfer to waterways and wetlands; and
- increased alkalinity and surfactants derived from chemicals used in equipment cleaning. (Australian Government, 2007)

Solid wastes

Sources of solid wastes generated at abattoirs include animal holding areas; slaughterhouse and processing areas; waste treatment plant; unwanted hide or skins and pieces, as well as unwanted carcasses and carcass parts. Manure is generated in animal holding areas. Materials not suitable for rendering, such as unwanted carcasses, come from the processing areas, along with paper, cardboard and plastics.

Airborne wastes:

Airborne wastes such as odours, dust and fuel burning emissions can arise from rendering process, waste effluent treatment plants, waste disposal techniques such as burning dead stock, animal holding pens and livestock transport vehicles. Sources of odours in the rendering plant include stale materials and emissions from

cookers. Odours in animal holding pens are produced by manure and urine. Slaughterhouse odours come from solid wastes such as paunch contents and blood residues. The impact of airborne pollutants depends on the direction of the wind and proximity to residential areas.

A guide for future site of meat processing establishments in Botswana was omitted in the recently enacted Livestock and Meat Industries Act of 2007. This paper is a review of the environmental and public health implications for site selection during the establishment of abattoirs.

MATERIALS AND METHODS

An assessment of the site selection for meat processing facilities in Botswana — both export and local markets was carried out with particular focus on the attendant environmental and public health implications for such facilities. Reports from various role players in the request from Gaborone City Council to establish and site its local abattoir were used as reference.

RESULTS AND DISCUSSION

There are presently six registered municipal slaughter houses in Botswana. These are:- Gaborone City Council abattoir, Francistown City Council abattoir, Serowe Central District Council abattoir, Jwaneng Town Council abattoir, Selebi-Phikwe Town Council abattoir and Lobatse Meat Inspection Training Centre abattoir.

Major villages such as Ghanzi, Maun, Tsabong, Kang, Mahalapye, Kanye and Molepolole have no municipal slaughterhouses. These areas are serviced mostly by privately owned butcheries. There are a few slaughter houses for poultry located in main urban centres such as Gaborone, Selebi Phikwe and F/Town. There is one ostrich abattoir located in Gaborone with a throughput of 5-10 birds per day.

The re-enactment of the Livestock and Meat Industries Act (2007) makes it an offence to establish and operate an abattoir for the purpose of processing meat and meat products for sale to

the sale to the public without a License issued for that purpose by the Director of Veterinary Services. This has led to an upsurge of potential entrepreneurs desiring to setup slaughter facilities especially in such areas where there are no municipal abattoirs.

Sites for abattoirs

Due to the concern for environmental effects from the wastes of abattoirs and the resultant impact on public health. Water Utilities Corporation (WUC), (1988) expressed strong objection to the proposed site of the new abattoir by the Gaborone City Council close to its main water resource. WUC held the view that the abattoir would create an unacceptable and unnecessary pollution hazard to the capital's main water resource.

In 1999, Phakalane Estates (Pty) Ltd wrote to Gaborone City Council that it was fundamental for an Environmental Impact Assessment (EIA) be conducted before it could reserve a site for the Council to construct an abattoir. It indicated that this was fundamental as a negative result could affect future values of the residential and the industrial area around the said site.

A Site Selection Report (2001) by the Consultants for the Gaborone City Council used the following criteria for determining a suitable site for the proposed abattoir wind direction and proximity to residential areas; suitability of surrounding land uses: impact on future development; trekking access of livestock to the abattoir, health risks from close interaction of residents to the abattoir and the aesthetic impact of the citing of die abattoir. Based on the findings of the environmental impact assessment-Phakalane Estates (Pty) turned down the request by Gaborone City Council for a site for their proposed abattoir.

In 2007 the Government of Western Australia made the following recommendations, which can be adequately applied to the Botswana situation when selecting a site for an abattoir by taking into consideration the following:

- a. The site must be zoned for the activity under the local government (council) town-planning scheme;
- b. It must have access to essential services, including waste recycling and disposal services;
- c. Must have sufficient on-site area to provide for the safe and effective management of wastes;
- d. Must have sufficient area for possible future expansion of premises;
- e. The site must have a gradient of less than ten per cent to facilitate earthworks and minimise soil erosion;
- f. Not flood prone or where the groundwater table is less than two metres below the surface;
- g. The site must retain an adequate buffer to sensitive environments such as residential areas, recreation facilities, drinking water sources and sensitive water resources;
- h. The soil must be stable and suited to animal holding, infrastructure construction, stabilisation pond construction and wastewater disposal;
- i. The site should have adequate internal buffers to rural dwellings, roads, waterways and wetlands;
- j. Suitable climatic conditions to allow for the effective operation of the waste management systems;
- k. Visual and odour impacts to neighbouring communities should be considered prior to construction.
- l. Facilities should not be established on land subject to seasonal flooding or within floodplains.
- m. Adequate separation distances should be maintained from natural waterways to minimise the risk of degradation of water quality.

CONCLUSION

In view of the tremendous environmental and public health concerns in the process of selecting a site for an abattoir as well as operational effects of a meat processing establishment, many countries have strict

legislations and regulations to mitigate these effects. Recommendations such as those cited above can be incorporated into the Botswana

re-enacted Livestock and Meat Industries Act 2007 so as to safeguard the environment and protect public health.

REFERENCES

- African Development Bank (2002). Republic of Botswana: Country Assistance Evaluation, Operations Evaluation Department May, 2002
- Australian Government, (2007). National Water Quality Management Strategy 2007 www.deh.gov.au/water/quality/nwqms/index.html. Accessed 28.04.2009
- Burrow Binnie Botswana, (2001). Proposed Gaborone Municipal Abattoir Environmental Impact Assessment: Site Selection Report for Gaborone City Council, 16 May 2001.
- Government of Western Australia, (2007). Water Quality Protection Note, Rural Abattoirs. <http://www.environment.nsw.gov.au/mao/abattoirs.htm#solid> accessed 28.04.2009
- Phakalane Estates (Pty) Ltd. (1999). Abattoir Site. Ref PE/1413/gcc 17 March 1999.
- Water Utilities Corporation, (1988). Abattoir Development - Gaborone Area. Ref D56/PGC/pt 15 February, 1988.