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Effect of Livestock and Livestock Based Industries on Environment

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ABSTRACT

The animal based industries produce milk, meat, egg, and also create large amounts of wastes that may be dangerous to the environment if not well managed. The requirement for dairy products is operated by urbanization, increasing per capita incomes, changing lifestyles as well as rapid growth in population. These increases in requirements for dairy products are expected to continue in the upcoming years. Livestock farmers have turned to the processing and accumulation of vast quantities of waste in order to maximize the value of the ever-increasing market for their goods. However, from the standpoints of cost, environmental protection, and biosecurity, disposing of these wastes remains a problem. The concern arises as to how these animal wastes can be handled without compromising food production, natural resources, or human health.

INTRODCUTION

Every single one of us has an effect on the climate and the world we live in. Food production and animal husbandry all depend on natural resources. India is the world's third-largest CO_2 emitter, with around 2.5 billion metric tonnes emitted in 2017. Deforestation, farming and livestock operations, urbanization, and the use of fossil fuels all have an effect on the climate (Shepherd, 2011). Every living organism emits greenhouse gases (GHG). Greenhouse gases are gases that are found in the earth's atmosphere that can be emitted both naturally and by humans. As the volume of GHG in the atmosphere raises, the earth's temperature rises. Carbon dioxide, methane, nitrous oxide, ozone, and water vapour are the most abundant GHGs.

Livestock Based Industries and Its Impact on Environment

The livestock and poultry industries provide beef, milk, and eggs, as well as vast amounts of waste water and solid wastes that may or may not be favourable to the environment. Excreta from livestock or poultry, as well as associated feed losses, beddings, wash water, and other waste materials, represent a valuable resource that, if used wisely, can replace significant amounts of inorganic fertilisers (Smith and Vanduk, 1987), conventional livestock feed (El Boushy and Vander Poel, 2000), and cooking gas (Henuk, 2001), but may be harmful to human & animal health (Taiganides, 2002).

Dairy animal wastes in the form of dung are best sources of nutrients and compost for use in the maintenance of soil productivity and crop yield. Studies with livestock have shown that 60–90% of the phosphorus & nitrogen content of livestock feed is expelled in dung and urine normally used as manure. Poultry and pig faeces collected in confinement feeding facilities were retrieved for re-feeding to beef cattle, dairy cattle, and sheep (Bell, 2002), and were found to pose no significant health risks to ruminants or poultry, nor did they have any harmful impact on meat, egg,

or milk content (Mcllroy and Martz, 1978). Livestock waste material has been traditionally used for biogas production in Asia, particularly in tropical areas such as India, Indonesia and Vietnam (Henuk, 2001). Diseases that are highly infectious and pathogenic, such as Foot and Mouth Disease and Swine Fever, can spread across rivers with animal effluent, putting farms downstream at risk of infection (Cameron et al., 2000). Livestock manure contains ammonia, which can be a pollutant that triggers significant eutrophication of rivers and lakes (Burton and Turner, 2003; IAEA/FAO, 2008). Eutrophication is described as a high supply of metals in a water system that induces an ecological imbalance that supports abnormally high levels of algae and aquatic plant growths (Burton and Turner, 2003; IAEA/FAO, 2008). This lowers oxygen levels in the water, posing a significant threat to marine species' survival and, as a result, food supplies and biodiversity (IAEA/FAO, 2008).

Impact of Livestock on Climate Change

The most important greenhouse gases from animal agriculture are methane and nitrous oxide. Methane, mainly produced by enteric fermentation and manure storage, is a gas which has an effect on global warming 23 times higher than carbon dioxide. Nitrous oxide, arising from manure storage and the use of organic/inorganic fertilizers, is a molecule with a global warming potential 265 times higher than carbon dioxide. The carbon dioxide equivalent is a standard unit used to account for the global warming potential.

How Do Animals Affect the Environment?

1. **Water Quality & Quantity**

Livestock can degrade water quality by allowing free access to water supplies where they can deposit dung and churn up dust, causing the water to become cloudy. Animal waste may be unsafe because it contains harmful bacteria that people can consume. Unsafe water is responsible for 3.2 % of all human deaths worldwide. This is a problem that is particularly prominent in developed countries. However, bacteria from cattle are responsible for just a limited proportion of these deaths (McAllister et al., 2012).

2. **Soil contamination**

When it comes to animal dropping use, the volatility of nitrogenous sources is crucial. Within 5000 metres of the source, approximately 30% of the ammonia volatilized and returns to soils and plants as wet or dry deposition. A significant majority of the remaining 70% reacts with SO2 and NOx in the atmosphere and is transported over a distance of 5 to around 1×10^6m (Lekkerkerk et al., 1995). High levels of nitrogen accumulation damage trees and nutrient-deficient natural habitats (Krupa, 2003).

3. **Air quality**

Organic and inorganic dust, bacteria, and other microorganisms, as well as gases such as ammonia, nitrous oxide, sulphur dioxide, hydrogen sulphide, and methane, are also examples of air contaminants (Okoli et al., 2006). The ammonium ion is converted to ammonia gas as the pH of animal waste rises, and is readily volatilized to air. The elevated concentrations of ambient N deposition are largely due to ammonia volatilization. Ammonia pollutants from wet animal

droppings have been linked to odours, which can be a nuisance in regions where industrial livestock farming is practised (Chavez et al., 2004).

4. **Climate change**

Combustion of fossil fuels, digestion or decomposition of organic matter, accumulated waste, and soils all contribute significantly to greenhouse gas emissions (CO2, CH4, and N2O) in livestock production. Large-scale processing of agricultural waste and surface application of the waste to soils has been shown to increase carbon pollution and contribute 9 to 12 % climate change and acid rain. Because of the alleged exposure of these gases to global warming, these emissions have gained a lot of attention in recent years. Methane is also released by animals and is produced by the anaerobic decomposition of organic matter. In stored manure and soils, nitrous oxide is created during nitrification or de-nitrification.

Mitigation Strategies

1. **Animal management**

Breeding for more active animals will reduce the amount of nutrients required to achieve the same degree of production. This is an excellent method for reducing greenhouse gas emissions. More dietary nitrogen protein is stored by a more effective animal, and nitrogen in faeces and urine is reduced. Animals with a specific genotype chosen for expanded output would be able to achieve their full potential only on a high input system with enough resources. To put it another way, new breeds and crosses can help mitigate greenhouse gas emissions substantially, but they must operate within manufacturing processes and climates that could be restricted by scarce capital and other factors.

2. **Biofuel production**

Animal biogas production through anaerobic digestion has long been a common practise in Asia, especially in tropical areas like Indonesia, India, and Vietnam (Henuk, 2001). This is particularly true in heavily populated areas where trees have been cut down and used for fuel or other uses, creating habitat destruction. The rising cost of fossil fuels used in industrial fertiliser production, as well as the awareness that petroleum supplies are finite, have sparked resurgence of interest in the use of animal waste.

3. **Organic fertilizer**

For decades, animal manures have been used as agricultural fertilisers. Animal droppings, according to Bell (2002), contain all essential plant nutrients and have been known to be an excellent fertiliser. Because of its high nitrogen content, poultry manure has long been regarded as one of the most desirable natural fertilizers (Sloan et al. 2008).

CONCLUSION

Over the years, poor management of animal waste produced by livestock industries has raised significant public concerns about environmental health and biosecurity problems, making direct dumping of livestock wastes on land less socially acceptable. The conversion of livestock waste into usable, environmentally sustainable goods seems to be the only viable solution to the growing environmental problems associated with indiscriminate livestock waste disposal.

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