Nature & Life

https://natureandlife.co.in/

VOLUME:2, ISSUE:1

Environmental Management of Dairy farms & Gaushalas in NCT of Delhi

(Cattles: Cows and Buffalos)

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Abstract: India is one of the biggest dairy products producing country across the world having 13,64,00,000 total number of cows and buffalos. Besides, it also generates large quantity of waste including dung, urine, washing water, animal hair, etc. Unscientific disposal of faecal waste and washing water especially in big urban cities like Delhi causes the problem of solid waste & liquid effluents disposal. Presently, it is washed away (untreated) into the drains, ultimately finding its way to water bodies causing depletion of surface water as well as ground water quality, air quality, soil erosion and pollution and many more issues. From this untreated waste, many gases are released, among those methane is the Green House Gas (GHG) having maximum global warming potential. The methane is generated due to incomplete fermentation under anaerobic conditions, causing air pollution and global warming. The methane could be utilised for cooking and power generation by the process called Bio-methanation. Also, the unhygienic conditions in dairy farms and gaushalas are resulting into severe health issues of sheltered cows and buffalos. This paper presents the impacts of poor management of dairy waste, health problems of cows and buffalos, CPCB guidelines for proper management of dairy waste for sustainable and beneficial usage of the waste.

Key Terms: Cattles, CPCB, DPCC, Bio-Methanation, Bio-CNG, Dairy, Gaushala, Ammonia, Water Pollution, Air Pollution, etc.

Introduction:

Man has coexisted with animals from time immemorial for fulfilling the requirements of food or clothing or safety and for some economic activities. There are some activities, such as gathering of food and tools for hunting, agriculture and pastoral activities (herding and livestock rearing), poultry, fishing, etc. which are directly associated with environment[1]. These activities are called primary economic activities. This paper elaborates the impacts of waste produced from cattles rearing on environment, its environmental management in India and the ill effects of poor management and hygiene of shelters on the health of bovine cattles.[1]

Dairies and Gaushalas:

In India, Cows are worshipped as mother goddess and are useful for mankind[2]. Gaushalas were established as the traditional shelter of old,

unproductive and abandoned cows with the aim of safety, feeding and care (Animal Welfare).

From ancient times, animal rearing (Cows and buffalos) and dairying (milking) is not only vital

[1] Cattles: Both milking and non-milking cows & buffalos.

skill of people but also Dairy Farms and Gaushalas are a major part of rural income[4].

Also, Dairy Farms or Dairies are commercial milking houses of milch animals (cows and buffalos) for production of milk and its products for human consumption[3]. Stringent cleanliness and health of animals is also of great concern.

As people use these by-products produced from dairy farms for commercial purposes and this is called Commercial Livestock Rearing[1].

A Bovine animal, on an average, weigh 400 kg and discharges 15-20 kg/day of dung and 15-20 litres/day of urine.

Method and Methodology:

Cattle population data was collect form Municipal Corporations of Delhi (2019) and CPCB Guidelines.

Cattle Population:

Cows & Buffalo populations in India and Delhi are given below:

India	Total Number of animals (Cows & Buffalos)	13,64,00,000	**Source**: Guidelines for Environmental Management of Dairy Farms and Gaushalas, July 2020[5].
Delhi	Number of Dairy Colonies in Delhi	10	**Source**: DPCC ATR dated 03.07.2019 in OA No. 46/2018 Nuggehalli Jayasimha V/s NCT of Delhi[6].
	Total Number of animals (Cows & Buffalos)	55842 approx.	

Factors affecting milk production & waste characteristics:

i. Species and classes and size of animals[7];
ii. Diet Plan and composition& feeding[8];
iii. digestion and absorption[8];
iv. Waste management and disposal systems[8];

Cattle Health, Challenges and Prospects: Diseases in cattle are major challenges among gaushala and dairy managers. The incidence of few important bovine diseases during 1996 which amply reflect the gravity of health status of bovines in India. Effective disease control depends upon early and accurate health information to the policy planners and implementers engaged in disease control programmes. Under the existing three-tiered animal health reporting system of the Government of India, information reaching higher authorities is incomplete and delayed thus rendering is insignificant to take any effective step against the diseases. Because of illiteracy and less interest, cattle owners report only the diseases with high mortality, while most of the sporadic cases remain unreported. Thus data recorded in existing disease reporting system suffer from problems of under reporting, and are inadequate to determine any trend regarding occurrence of diseases and losses caused by disease to assess its economic value. The extent of environmental damage due to discharge of untreated solid & liquid waste is pathetic.

Present Scenario[9]:

Unscientific management of dairy farms in Delhi resulted into the pollution problems, including disposal of solid waste and waste water, air pollution, etc. Observing deterioration of water & air pollution, a NGO filed a case in Hon'ble NGT in the year 2018. According to Hon'ble NGT order in OA No. 46/2018 Nuggehalli Jayasimha V/s Government of NCT of Delhi dated **01.04.2019**, The Joint inspection (CPCB & DPCC) Report dated 11.04.2018 mentioned that "the dairies were being managed unscientifically without following the hygiene norms, There is no facility for disposal of dung, which is mixed with effluents like urinary discharge, floor washing. It is also observed that injectable drugs are dumped on open land. Animals remain confined without access to sunlight and space movement."

Key Directions of Hon'ble NGT:

- Early diagnosis and treatment of diseases can help minimize day to day losses of 30- 100 per cent in production/performance[10].
- Veterinary Officers are to examine each of the heads of the cattle/animal which are exposed to all ill-effects due to illegal running of dairy farms[11].
- The Animal Husbandry department to test and examine each animal, shifting them to such of ponds/cattle care centres or any other establishment created for protection and rehabilitation of the animals and to retain them[12].
- Steps to be taken for prevention of such running of illegal dairy farms and the protection and rehabilitation of cattle/animal[12].

- The DPCC (Delhi Pollution control Committee) is required to ensure that the polluting activities, shouldn't run without consent to operate, and are stopped by way of prohibitory order, prosecution and recovery of compensation which has not been done.

Environmental Issues[9]:

1. No segregation/housing system is found for young calves, bulls, old animals, sick animals etc. However, the animals are housed in sheds with paved floor without proper ventilation.
2. No segregation of solid dung & liquid waste has been observed in dairy farms. It should be collected in three separate streams namely solid waste (dungs etc.), liquid waste

(biodegradable) and bio-medical waste (vaccines, vails, medicines, syringes etc.) in suitable bins.

1. No infrastructure is available for utilization/scientific disposal of the solid waste such as bio- methanation, composting etc.
2. Discharge of untreated solid & liquid waste pollutes soil as well as water bodies indiscriminately.
3. No Consent mechanism from respective SPCBs/PCCs exists, thus running illegally.

Major Constraints in Development of Dairying:

Followings are the constraints responsible for poor management of dairies:

i. Lack of awareness among dairy owners/Gaushala managers;
ii. Lack of efficient veterinary extension services;
iii. Inadequate and inappropriate planning;
iv. Lack of proper infrastructure & technology;
v. Lack of resources.

Regulations for Environmental Management of Dairy Waste:

CPCB has published guidelines for Environmental Management of Dairy Farms and Gaushalas on July, 2021.

Conclusion:

It has been a growing trend in the bovine population of India in response to the increasing demands for the farm animal products that results in the production of organic waste and their discharge in drains and water bodies. This study shows that the treatment of the Dairy or Gaushala animal's waste should be managed and treated as per the revised "CPCB Guidelines for Environmental Management of Dairy Farms and Gaushalas, July 2020" by the anaerobic digestion or biogas technology can potentially contribute to the generation of huge amounts of the renewable energy as biogas. In addition, the treated organic matters could be used as biochemical and fertilizer in the agriculture land for crop cultivation. This study demonstrated that animal waste is the promising low-cost and sustainable energy source which could be efficiently utilized for the generation of biogas energy and electrical power. Furthermore, anaerobic digestion of animal waste reduces their detrimental impacts on the environment by enhancing public health. It is concluded that cattle dung has lot of potential for production of bio-CNG, thus reducing the burden on fossil fuel & needs advance research.

Way Forward:

Advanced Technology of Fermentation and Enhanced Methanation (AFEM)-Enhanced Biomethanation Technology:

In the AFEM process, all of the organic content in food waste, manure or sewage sludge is completely digested by the nutrient enriched microbiology. Quantity of biogas produced is more when compared with conventional AD digesters. Where the AD is not complete and residual volatile solids (VS) content (about 50%) can be found. Additionally, the effluent from the AFEM system becomes grey water instead of digestate which requires additional processing such as recovery and drying, leading to additional handling – and hence costs. As the AFEM process accomplishes completion of the digestion process, this system achieves maximum biogas production and produces biogas which is much higher quality (80-90% methane compared to the

50-70% methane content from conventional AD technologies). The only effluent, in addition to biogas is reusable grey water plus a very small amount of completely mineralized, inert and inorganic sludge. The reusable grey water is used for mixing with fresh feedstock. The inorganic sludge can be used as construction material, road laying or simply as soil.

Advantages:

1. Eco-friendly and Sustainable;
2. Low Cost;
3. Renewable Source of Energy;
4. Proper utilization of Dairy Waste.

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