"Guidelines for Environmental Management of Dairy Farms and Gaushalas"

Central Pollution Control Board

(Ministry of Environment, Forest and Climate Change, Govt. of India)

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CONTENT

1. Background

India ranks first among world's milk producing Nations since 1998 and has largest bovine population in the World. Dairying has become an important secondary source of income for millions of rural families and has assumed most important role in providing employment and income opportunities particularly for marginal farmers.

Dairy farms are establishment which in-house milching animals to produce milk for distribution or supplying milk to milk processing plants (other than own consumption).

Gaushalas are establishment which in-house weak, sick, injured, handicapped and abandoned homeless cattle/cows to rehabilitate them. Different terminology is used for Gaushalas in different states like Gosadans, Pinjrapole, etc.

As per 20th Livestock Census carried out by Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture and Farmers Welfare, in 2019, state-wise total population of bovine by sex and in urban & rural area is as follow:

Sl. No.	State/UT	Male Bovine	Female Bovine	Total Bovine in Rural Area	Total Bovine in Urban Area	Total Bovine
1.	A & N Islands	10,899	29,239	37,916	2,222	40,138
2.	Andhra Pradesh	15,73,589	92,45,997	1,03,97,667	4,21,919	1,08,19,586
3.	Arunachal Pradesh	3,06,246	4,13,583	7,03,018	16,811	7,19,829
4.	Assam	33,77,705	79,53,249	1,11,05,707	2,25,247	1,13,30,954
5.	Bihar	18,15,419	2,13,02,355	2,23,53,630	7,64,144	2,31,17,774
6.	Chandigarh	3,370	22,247	8,927	16,690	25,617
7.	Chhattisgarh	52,00,444	59,58,232	1,07,13,966	4,44,710	1,11,58,676
8.	Dadar & Nagar Haveli	27,015	13,718	39,223	1,510	40,733
9.	Daman & Diu	587	1,627	1,637	577	2,214
10.	Delhi	34,868	2,13,707	2,39,796	8,779	2,48,575
11.	Goa	18,081	69,373	78,940	8,514	87,454
12.	Gujarat	25,20,220	1,76,56,667	1,93,89,940	7,86,947	2,01,76,887
13.	Haryana	7,48,898	55,47,807	58,27,031	4,69,674	62,96,705
14.	Himachal Pradesh	4,99,630	19,76,892	24,47,638	28,884	24,76,522
15.	Jammu & Kashmir	5,45,636	27,10,666	31,55,710	1,00,592	32,56,302
16.	Jharkhand	51,33,373	74,39,992	1,21,84,691	3,88,674	1,25,73,365
17.	Karnataka	20,39,509	94,14,055	1,08,00,819	6,52,745	1,14,53,564
18.	Kerala	2,07,111	12,36,389	13,15,665	1,27,835	14,43,500
19.	Lakshadweep	785	1,724	2,509	0	2,509
20.	Madhya Pradesh	71,00,049	2,19,57,910	2,76,69,875	13,88,084	2,90,57,959
21.	Maharashtra	53,06,297	1,42,89,699	1,88,97,723	6,98,273	1,95,95,996
22.	Manipur	87,062	1,82,699	2,37,699	32,062	2,69,761
23.	Meghalaya	3,53,580	5,65,704	9,11,065	8,219	9,19,284
24.	Mizoram	15,775	35,992	38,434	13,333	51,767
25.	Nagaland	59,057	58,016	1,09,716	7,357	1,17,073
26.	Odisha	42,66,720	60,95,574	1,00,34,984	3,27,310	1,03,62,294
27.	Puducherry	4,695	69,684	57,322	17,057	74,379

28.	Punjab	3,47,572	61,99,835	60,99,440	4,47,967	1,65,47,407
29.	Rajasthan	30,06,285	2,46,24,661	2,65,18,272	11,12,674	2,76,30,946
30.	Sikkim	36,209	1,18,164	1,51,972	2,401	1,54,373
31.	Tamil Nadu	8,14,996	92,22,459	89,12,712	11,24,743	1,00,37,455
32.	Telangana	19,09,034	65,49,811	81,46,252	3,12,593	84,58,845
33.	Tripura	1,24,505	6,21,657	7,08,228	37,934	7,46,162
34.	Uttar Pradesh	45,52,599	4,74,83,827	4,95,30,075	25,06,351	5,20,36,426
35.	Uttarakhand	5,50,595	21,67,900	25,34,526	1,83,969	27,18,495
36.	West Bengal	44,35,306	1,52,73,592	1,91,76,146	5,32,752	1,97,08,898
All India		**5,70,33,721**	**24,67,24,703**	**29,05,38,871**	**1,32,19,553**	**30,37,58,424**

2. Categorization of Dairy Farms and Gaushalas

Dairy Farms/Gaushalas are categorised on basis of nos. of bovine animals in a Dairy/Gaushala located in urban, peri-urban & rural area.

2.1 Dairy Farms

According to inventory received from SPCBs/PCCs and it is analysed that 60-70% Dairy Farms are having upto 25 animals, 15-20% Dairy Farms are having upto 100 animals and 15-20% Dairy Farms are having more than 100 animals. Therefore, they have been categorized as small, medium & large Dairy farm, respectively. It has been analysed that 5-10%, 5-10% and 80-90% Dairy Farms located in urban, peri-urban & rural area, respectively.

2.2 Gaushalas

Similarly, inventory received from SPCBs/PCCs for Gaushalas and it is analysed that 15-20 % Gaushalas having upto 100 animals and 80-85% Gaushalas having more than 100 animals. Therefore, Gaushala having upto 100 animals, 1000 animals & more than 1000 animals can be categorized as small, medium & large Gaushala, respectively. It has been analysed that 50-55%, 5-10% and 35-45% Gaushalas located in urban, peri-urban & rural area, respectively.

3. Environmental Issues in Dairy Farms and Gaushalas

Major environmental issues of Dairy farms and Gaushalas are related to disposal of dung and urinal wastewater. Poor handling & disposal of dung and wastewater causes water pollution & odour problem. A Bovine animal, on an average, weigh 400 kg and discharges 15-20 kg/day of dung and 12-14 litres/day of urine. Solid wastes produced from Dairy farms and Gaushalas are bovine dung, feed residue, etc. which are organic and non-hazardous in nature but requires proper handling and disposal.

3.1 Dairy Farms

3.1.1 Urban & Peri-urban Area

Majority of Dairy Farms are in clusters. Issue of disposal of dung & wastewater from Dairy farms is predominant in urban & peri-urban area where it is discharged in drains, leading to clogging, which ultimately reach to and pollute rivers. These clogged drains become

breeding ground for mosquitoes creating health hazards and odour nuisance. Wastewater is generated from floor cleaning, bathing of animals, urine, etc. and disposed of without treatment into drains. Dung produces many gases/compounds such as carbon dioxide, ammonia, hydrogen sulphide, methane, etc. which emitted into atmosphere and responsible for odour.

3.1.2 Rural Area

Dairy farms located in rural area are run by small & marginal farmers which produces milk for self-consumption and excess sell in local market. Dung being utilized as a manure in field. Problem arises when dung is stored for very long time and create odour. Wastewater generated majorly from urine which is generally disposed of without treatment into land due to unpaved floor or goes to nearby drain.

3.2 Gaushalas

3.2.1 Urban & Peri-urban Area

Dung is generally stored for very long time and creating odour issues. Sometimes, it finds its way to drains also. Dung is utilised as a manure in field and also in making dung wood/dung cakes. Wastewater is generated from floor cleaning, bathing of animals, urine, etc. Bathing of animal is done occasionally & floor cleaning is done mechanically. The urine usually discharges in drain without any treatment. However, it is also utilized for medicinal uses. Therefore, wastewater generated per bovine animal from Gaushalas is comparatively lower than Dairy Farms.

3.2.2 Rural Area

Dung is being utilised as a manure in field and also used as fuel for domestic purpose. Problem arises when it stored for very long time and creating odour issues. Wastewater is generated from floor cleaning, bathing of animals, urine, etc. Bathing of animal is done occasionally & floor cleaning is done mechanically. The urine usually discharges in drain without any treatment. However, it is also utilized for medicinal uses.

4. Methods for Disposal/Utilisation of Dung

Disposal of bovine dung is biggest challenge in dairy farms and gaushalas. However, bovine dung, if effectively utilised, can be a resource of manure & energy. Bovine dung may be used for many purposes i.e. for combustion (dung wood) or for producing biogas or as soil conditioner or as fertilizers or as material for wall plastering, etc. Following methods for disposal/utilisation of solid wastes (dung) may be adopted:

a. *Composting/Vermicomposting*: Composting is a manure management practice to reduce impact on the environment. Composting is biological decomposition and stabilization of organic material. The process produces a final product that is stable, free of pathogens, reduced odours and can be applied on land as manure. Vermicomposting is method of preparing compost with use of earthworms that enriches soil quality by improving its physicochemical and biological properties. It is becoming popular as a major component of organic farming system.

b. *Biogas/Compressed biogas (CBG) production*: Biogas plants are best way to handle dung waste. Biogas is generated in process of biodegradation of organic materials under anaerobic conditions which may be utilised for cooking and power generation. Biogas plant generated digested organic manure for crops. Biogas can be processed and filled in cylinders. Bio-gas may be further purified to remove hydrogen sulphide (H_2S), carbon dioxide (CO_2) & water vapour and compressed (known as Compressed Bio Gas, CBG) which has methane (CH_4) content of more than 90% as per BIS standard IS 16087:2016. CBG has calorific value and other properties similar to CNG and hence can be utilized as green renewable fuel as replacement of CNG in automotive, industrial and commercial areas.

c. *Manufacture of dung wood or dung cake to be used as fuel*: Bovine dung can be used as fuel as a replacement of firewood. Bovine dung can be dewatered and converted to value added products such as logs, powder etc. by mechanized/semi-mechanized machines.

Following options for disposal/utilization of dung may be adopted by Dairy Farms and Gaushalas:

Sl. No.	Dairy Farms/ Gaushalas	Methods for Disposal/Utilization of Dung
1.	Small Dairy Farms	• Composting/vermicomposting, or • Manufacture of dung wood/dung cake, or • Combination of both
2.	Medium Dairy Farms	• Combination of any of three methods for disposal/utilization of dung
3.	Large Dairy Farms	• Biogas/compressed biogas production or • Combination with any of remaining method
4.	Dairy Farms in Rural Area	• Composting/vermicomposting, or • Manufacture of dung wood/dung cake
5.	Dairy Farms in Cluster	• Common Biogas/compressed biogas production, and • Any of remaining method at individual level
6.	Small & Medium Gaushalas	• Combination of any of three methods for disposal/utilization of dung
7.	Large Gaushalas	• Biogas/compressed biogas production or • Combination with any of remaining method

5. Guidelines for Waste Management in Dairy Farms

Following guidelines are framed for management of wastes from Dairy farms. These guidelines are applicable to establishment which are discharging their wastes into environment. These establishments shall also follow existing laws, rules, guidelines, directions and standard operating procedures issued by different organizations.

5.1 *Guidelines for Waste Management in Dairy Farms located in Urban & Peri-urban Area*

5.1.1 Solid Waste Management

Guidelines to be followed for management of solid wastes are as under:

i. Dung from floor of shed should be collected at regular interval, so as to keep floor clean. Surrounding areas should also be cleaned regularly to prevent obnoxious smell in area.
ii. Premises and its surrounding areas should be properly sanitized and disinfected, e.g. by sprinkling crushed lime.
iii. Dung & fodder residue etc. should not be washed into drains in order to avoid clogging of drains. Local bodies/corporations/SPCBs should ensure that untreated wastes are not discharged outside premises.
iv. Collected solid wastes should be stored properly for its utilization.
v. Small Dairy Farms may adopt dung for manufacture of dung wood/dung cake or composting/vermicomposting or combination of both methods for disposal/utilization of solid wastes. In case of cluster, biogas/compressed biogas production may be adopted for disposal/utilization of solid wastes in association with entrepreneurs or local dairy farmers association. Local bodies/corporations/SPCBs should facilitate Dairy farmers/entrepreneurs/NGOs in setting up of individual or common utilization facilities.
vi. Medium & Large Dairy Farms may adopt a combination of disposal/utilization methods like manufacturing of dung wood or biogas generation or vermicomposting. However, Large Dairy Farms may setup biogas/compressed biogas production facility either by themselves or in association with entrepreneurs.
vii. Domestic hazardous wastes (vaccines, vails, medicines, syringes, etc.) should be disposed as per provisions of "Solid Waste Management Rules, 2016". If they have their own medical facilities then wastes should be disposed as per provisions of "Bio-medical Waste Management Rules, 2016".

5.1.2 Wastewater Management

Guidelines for management of wastewater are as follow:

i. Water should be judiciously used for bathing of bovines and other services including floor cleaning to contain wastewater quantity to 100 litres/day/bovine.
ii. Adequate infrastructure should be provided to ensure proper handling, treatment and disposal of wastewater. They may set-up individual or common treatment facilities where in cluster. Local bodies/corporations/SPCBs should facilitate Dairy farmers/ entrepreneurs/NGOs in setting up of individual or common treatment facilities.
iii. Wastewater should be adequately treated so as to meet standards as prescribed by SPCBs/PCCs.
iv. Flooring of shed should be properly paved (impervious) with a wastewater collection system. However, floor should not be slippery in order to ensure safety of animals.

5.1.3 Air Quality Management

Guidelines for management of air quality/emissions are as follow:

i. Animal housing should be ventilated allowing sufficient supply of fresh air to remove humidity, dissipate heat and prevent build-up of gases such as methane, carbon dioxide, ammonia, etc.
ii. Good housekeeping practices like maintaining proper sanitary conditions, protecting dung from unwanted pests/insects should be followed in order to minimize odour nuisance.
iii. Floor, feeding, water and air spaces available for each animal should be adequate for standing, resting, loafing, movement, feeding, watering and ventilation. Space requirements should be provided as per Bureau of Indian Standards (BIS) (refer BIS: 12237-1987 given at **Annexure-I**).
iv. It is suggested to obtain ration advisory for improving/modifying quality and dosage of feed/forage/supplements from any of agricultural institutes/departments like Krishi Vigyan Kendra, State Dairy Department, Animal Husbandry Department, NDRI, NDDB, etc. in order to reduce enteric methane generations from livestock. It is beneficial to animal health/nutrition and reduced impact on environment.
v. Plantation of trees or green belts, wherever feasible, to provide a barrier against the spread of foul smell or noise originating from them.

5.1.4 Siting Policy

Siting criteria will be applicable for new establishment. Existing establishments should take appropriate environmental friendly practices as per Guidelines. Dairy farm shall be setup as per siting policy/guidelines of local administration and may follow criteria as below:

i. It should be located in area wherever permissible and atleast 100 meters away from residential dwellings, health centres/hospitals & schools in order to avoid odour problem,
ii. Atleast 200 meters away from water spread area of major watercourses like Lake, canal and major drinking water sources,
iii. Away from flood plain area of River and areas having shallow groundwater.
iv. Atleast 5 meters of inter-se distance between two establishments (each establishment should provide 2.5 meters from each side) for ventilation should be provided and developed green belt.

5.2 Guidelines for Waste Management in Dairy Farms located in Rural Area

5.2.1 Solid Waste Management

i. Dung should be collected & stored properly for its utilization. It should be used as compost in field or in making dung wood or vermi-compost. Biogas production may be practiced wherein cluster as a source of energy for rural area.

ii. Dung & fodder residue should not be washed into drains in order to avoid clogging of drains and surrounding areas should also be cleaned regularly to prevent obnoxious smell in area.
iii. Provisions of "Solid Waste Management Rules, 2016" should be followed for disposal of domestic hazardous wastes (vaccines, vails, medicines, syringes, etc.).

5.2.2 *Wastewater Management*

i. Water should be judiciously used to contain wastewater quantity to 100 litres/day/ bovine.
ii. Floor should be paved and wastewater should be collected and utilized for agriculture purpose. Floor should not be slippery in order to ensure safety of animals.
iii. Wastewater should be adequately treated so as to meet standards as prescribed by SPCBs/PCCs.

5.2.3 Air Quality Management

i. Animal housing should be ventilated allowing sufficient supply of fresh air to remove humidity, dissipate heat and prevent build-up of gases.
ii. Good housekeeping practices should be followed in order to minimize odour nuisance.
iii. Floor, feeding, water and air spaces available for each animal should be adequate for standing, resting, loafing, movement, feeding, watering and ventilation. Space requirements should be provided as per Bureau of Indian Standards (BIS) (refer BIS: 11799-2005 given at **Annexure-II**).
iv. It is suggested to obtain Ration advisory for improving/modifying quality and dosage of feed/forage/supplements from any of agricultural institutes/departments like Krishi Vigyan Kendra, State Dairy Department, Animal Husbandry Department, NDRI, NDDB, etc. to reduce enteric methane generations from livestock.
v. Plantation of trees or green belts, wherever feasible, to provide a barrier against spread of foul smell or noise originating from them.

5.2.4 Siting Policy

Siting criteria will be applicable for new establishment. Existing establishments should take appropriate environmental friendly practices as per Guidelines. Dairy farm shall be setup as per siting policy/guidelines of local administration.

These should be located away from residential dwellings/hospitals/schools in order to avoid odour issue as per siting norms of local administration. It should be atleast 100 meters away from water spread area of major drinking water sources in order to avoid contamination of water bodies. These should be away from flood plain areas of River and areas having shallow groundwater.

Atleast 5 meters of inter-se distance between two establishments for ventilation, this space of 5 meters (2.5 meters from each side from each unit) shall be developed for green belt.

6. Guidelines for Waste Management in Gaushalas

Following guidelines are framed for management of wastes from Gaushalas located in urban, peri-urban & rural area. These guidelines are applicable to establishment which are discharging their wastes into environment. These establishments shall also follow existing laws, rules, guidelines, directions and standard operating procedures issued by different organizations.

6.1 Solid Waste Management

Guidelines to be followed for management of solid wastes are as under:

i. Dung from floor of shed should be collected at regular interval, so as to keep floor clean. Surrounding areas should also be cleaned regularly to prevent obnoxious smell in area.
ii. Premises and its surrounding areas should be properly sanitized and disinfected, e.g. by sprinkling crushed lime.
iii. Dung & fodder residue etc. should not be washed into drains in order to avoid clogging of drains. Local bodies/corporations/SPCBs should ensure that untreated wastes are not discharged outside premises.
iv. Solid wastes should be stored properly for its utilization in dung wood manufacturing or biogas generation or vermicomposting. In case of small & medium scale Gaushalas, a combination any of methods may be adopted for utilization of dung wherein large scale Gaushalas may setup biogas generation facility at its own or in partnership with entrepreneurs.
v. Domestic hazardous wastes (vaccines, vails, medicines, syringes, etc.) should be disposed as per provisions of "Solid Waste Management Rules, 2016". If they have their own medical facilities then the wastes should be disposed as per provisions of "Bio-medical Waste Management Rules, 2016".

6.2 Wastewater Management

Guidelines for management of wastewater are as follow:

i. Water should be judiciously used for bathing of bovines and other services to contain wastewater quantity to 50 litres/day/bovine. (As water utilized by Gaushala is less in comparison to Dairy Farm due to occasional bathing & mechanized floor cleaning).
ii. Adequate infrastructure should be set-up to ensure proper handling, treatment and disposal of wastewater. Local bodies/corporations/SPCBs should facilitate Gaushala owners/ entrepreneurs/NGOs in setting up of treatment facilities.
iii. Wastewater should be adequately treated so as to meet standards as prescribed by SPCBs/PCCs or utilized for various medicinal purpose.
iv. Flooring of shed should be properly paved (impervious) with a wastewater collection system. However, floor should not be slippery in order to ensure safety of animals.

6.3 *Air Quality Management*

Guidelines for management of air quality/emissions are as follow:

i. Animal housing should be ventilated allowing sufficient supply of fresh air to remove humidity, dissipate heat and prevent build-up of gases.
ii. Good housekeeping practices like maintaining proper sanitary conditions, protecting dung from unwanted pests/insects should be followed in order to minimize odour nuisance.
iii. Floor, feeding, water and air spaces available for each animal should be adequate for standing, resting, loafing, movement, feeding, watering and ventilation. Space requirements should be provided as per Bureau of Indian Standards (BIS) (refer BIS: 11942-1986 given at **Annexure-III**).
iv. It is suggested to obtain Ration advisory for improving/modifying quality and dosage of feed/forage/supplements from any of agricultural institutes/departments like Krishi Vigyan Kendra, State Dairy Department, Animal Husbandry Department, NDRI, NDDB, etc. to reduce enteric methane generations from livestock.
v. Plantation of trees or green belts, wherever feasible, to provide a barrier against spread of foul smell or noise originating from them.

6.4 Siting Policy

Siting criteria will be applicable for new establishment. Existing establishments should take appropriate environmental friendly practices as per Guidelines. Gaushala shall be setup as per siting policy/guidelines of local administration.

These should be located atleast 100 meters away from residential dwellings/schools/hospitals in order to avoid odour issue and away from the water spread area of major drinking water sources. These should be away from flood plain areas of River and areas having shallow groundwater. Atleast 5 meters of inter-se distance between two establishments for ventilation, this space of 5 meters (atleast 2.5 meters from each side from each unit) shall be developed for green belt.

7. Regulatory/ Monitoring Mechanism for Dairy Farms & Gaushalas

i. Local authorities/corporations should carry out inventory of Dairy farms and Gaushalas located in their jurisdiction in inventory performa given at **Annexure-IV** and same should be updated & shared with concerned SPCB/PCC on annual basis (calendar year wise).
ii. Local bodies/municipal corporations shall publish a public notice in newspapers and on their website for registration of Dairy farms and Gaushalas as per municipal laws. Registration may be done preferably through online mode and same may be displayed at their websites.
iii. SPCBs/PCCs shall publish a public notice for Dairy farms & Gaushalas to obtain consent to establish and consent to operate under Water Act, 1974 as well as Air Act, 1981 as per the categorization of industries in Orange and Green Category, respectively.
iv. SPCBs/PCCs/local bodies/municipal corporations shall upload Environmental Guidelines on their website and also circulate to all Dairy farms and Gaushalas.

v. Concerned SPCBs/PCCs/local bodies/corporations should monitor dairy farms and gaushalas on regular basis to ensure proper disposal of bovine dung and wastewater to check compliance of environmental norms. SPCBs/PCCs will consider carrying capacity of surroundings while allowing a new establishment and laying down environmental norms.

vi. SPCBs/PCCs shall carry out environmental audit of atleast 2 Dairy farms and 2 Gaushalas, randomly selected from each district of State/UT and submit compliance and action taken report to CPCB on half yearly basis.

vii. SPCBs/PCCs shall submit status of compliance of guidelines by Dairy farms and Gaushalas located in their jurisdiction in form of report once in six months to CPCB for Audit purpose.

viii. CPCB shall carry out environmental auditing of 4 Dairy farms and 4 Gaushalas in each State/UT, randomly selected based on information received from SPCBs/PCCs on annual basis.

ix. In case of any violation of environmental norms under Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981 and Environmental (Protect) Act, 1986 by Dairy farms and Gaushalas, concerned SPCBs/PCCs should impose environmental compensation as per CPCB methodology for "Environmental Compensation to be levied on Industrial Units", for damaging the environment and in order to stop polluting activity and initiate prosecution for repeatedly polluting units.

x. SPCBs/PCCs should provide training and consultation to Gram Panchayat for implementation of guidelines in their jurisdiction. Gram Panchayat should ensure implementation of guidelines by Dairy farms and Gaushalas falling under their jurisdiction for handling and management of wastes.

xi. Hands on practical trainings on environment/waste management & treatment technologies, scientific feeding for enteric methane reduction, waste to wealth management programme, etc. should be provided to Dairy & Gaushala workers/entrepreneurs by local bodies/ SPCBs/PCCs on regular interval.

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