

Suruchi Consultants

Sustainable dairying

An Indian context

Sustainable dairying requires a balance between social, economic and environmental goals. Till date Indian dairy farmers have insulated themselves from innovation when it comes to applying environmentally friendly practices and pursuing new technologies because lack of knowledge or monetary might.

Environmental degradation has holistic impacts on our ecosystem, plants, animals, water bodies and even the soil. It even has health impacts on people and restricts their recreation, food gathering and aesthetic pleasure in the landscape. Pollution can also compromise local cultural and spiritual values. These factors may bring society's pressure to bear on the dairy industry and other land users.

As per the Environmental Protection rule 1986 and different acts passed by central pollution control board seeks to address the effects on the environment of Dairy farming and processing. Under these acts, local councils and state pollution control boards manage the effects of activities on natural resources, including discharges, and depletion of natural resources.

Sr. No.	Industry	Parameter	Standards
1	2	3	4
156.	DAIRY	EFFLUENTS	Concentration in mg/l except pH
		pH	6.5 – 8.5
		*BOD ² [3 days at 27°C]	100
		** Suspended Solids	150
		Oil and Grease	10
		Waste Water generation	-

Note : *BOD may be made stringent upto 30 mg/l if the recipient fresh water body is a source for drinking water supply. BOD shall be upto 350 mg/l for the chilling plant effluent for applying on land provided the land is designed and operated as a secondary treatment system with suitable monitoring facilities. The drainage water from the land after secondary treatment has to satisfy a limit of 30 mg/l of BOD and 10 mg/l of nitrate expressed as 'N'. The net addition to the groundwater quality should not be more than 3 mg/l of BOD and 3 mg/l of nitrate expressed as 'N'. This limit for applying on land is allowed subject to the availability of adequate land for discharge under the control of industry, BOD value is relaxable upto 350 mg/l, provided the wastewater is discharged into a town sewer leading to secondary treatment of the sewage.

** Suspended solids limit is relaxable upto 450 mg/l, provided the wastewater is discharged into town sewer leading to secondary treatment of the sewage.

THE MAIN SOURCES OF POLLUTION

Pollution or discharges can occur from a point source such as an effluent pond discharge or feed pad. For example, concentrated effluent could reach a waterway and release toxic ammonia and organic matter that need to be broken down by micro-organisms, taking oxygen out of the water and impacting on stream life.

Non-point source pollution is diffuse and does not originate from a single identifiable source or event. In the case of dairy farming, this may be:

- runoff from paddocks, carrying faeces, soil, or nutrients into surface waterways or through the soil to groundwater
- contaminants that arise from farm inputs such as fertilisers building up in the soil over time
- discharges to the air of greenhouse gases from stock or soil that can have a cumulative effect on the global climate.

ANIMAL WASTE AND WASTE MANAGEMENT

Dairy farms produce large amounts of waste in small areas. For example, a single dairy cow produces approximately 120 pounds of wet manure per day. The waste produced per day by one dairy cow is equal to that of 20-40 people. If properly stored and used, manure from animal feeding operations can be a valuable resource. Application of manure (Khaad) to land has been used in Indian since ages and it is environmentally sound approach to fertilizing fields and it also enhances as well as replenishes humus. Manure can also be used in digesters (machines which decompose manure and capture the methane gas emitted also called Gobar gas plant or digester) to produce electricity, and other useful by-products such as ethanol. However, if not managed correctly, the waste produced by Dairy farms can pollute the environment – especially water.

CONSEQUENCES OF WASTE MISMANAGEMENT

Improperly stored or used, animal waste can pollute rivers and underground drinking water supplies. Inadequately sized and poorly-lined ponds or other storage structures allow manure to escape into the surrounding environment. Poorly maintained and unlined corrals let contaminated wastewater containing to seep into ground water.

Though Indian is number one producer of milk in world but still it lacks any consolidate policy for sustainable dairy or dairy waste management. In absence of any clear guideline most of the dairies lack necessary waste management system in place such as such as berms that divert rain water from the animal confinement area. Few of the most curtail and dairy rich areas are always at risk of runoff. During seasonal flooding of Gangatic and Brahmaputra planes during monsoon season, stored manure gets washed into streams adding

on to the calamity. Whereas applying too much dairy wastewater to fields, by inadequate methods, can also cause the contaminants in animal waste to pollute streams or ground water before they can be completely absorbed by the land and crops.

India also misses any norms for land selection for establishment of dairy farm. Farm location -- for example, on hillsides, along streams, and atop sensitive ground water areas -- complicates sound animal waste management. Animal waste has the potential to contribute pollutants such as nutrients (e.g., nitrate, phosphorous), organic matter, sediments, pathogens (e.g., giardia, cryptosporidium), heavy metals, hormones, antibiotics and ammonia to the waters we use for drinking, swimming and fishing. In addition to water quality problems, Dairies can also contribute to significant air quality problems, including dust and odours.

KEY ACTIONS REQUIRED

APPROACH

We have to understand that high standards of environmental compliance are important both from a public and investor's view point. We have to commit to achieving good environmental outcomes given the limitation of known technologies and basic economics.

ESTABLISHMENT

If India foresees to retain its position as number one producer, the all us including Dairy farmers, processors and government bodies, like Dairy development board, Pollution control board, State agencies, councils, corporation, NGO's will have to commit to ensuring that all effluent management infrastructure (solids separation, effluent storage, low application rate irrigation) will be at good practice levels, meeting or exceeding Regional/National standards which ever applicable.

OPERATION

National Pollution control board along with Dairy development board will have to develop and execute a nation policy for Sustainable dairy. As well as we will have to adopt systems and procedures that could ensure the sustainable operation of effluent management infrastructure, including ensuring effluent is applied to pasture at appropriate soil moisture levels, with appropriate irrigation rotation and suitable records are maintained.

FENCING WATER WAYS

Preserving our valuable waster bodies, ground water aquifers and environment should be out utmost priority. Therefore Stocks should be excluded from water ways and riparian margins should be established where needed.

NUTRIENT MANAGEMENT

There is one thumb rule "What goes into the cow, Comes out of the cow". Previously, nutrient management simply meant feeding cattle a balanced diet for desired growth and production. Today, nutrient management also encompasses providing crops a "balanced diet" for desired production while minimizing adverse environmental effects. Nutrients should be

applied to crops at rates needed to optimize crop growth and to maintain soil productivity. To avoid contamination of air or water, excessive nutrients should not be applied to fields. Nutrient budgets should be used to ensure nitrogen loss is within industry standards. Appropriate nitrification inhibitor products will be used where there is evidence of their efficacy and economic benefit.

NUTRIENT MANAGEMENT PLAN

Though not required for all operations, it is strongly recommended that all Dairy/Agricultural facilities develop a nutrient management plan (NMP), documenting when and how much manure will be applied to their crop lands, and the actual nutrient contents of the applications. This is the best way to prevent surface water discharge and minimize effects on underlying groundwater. There is no law/legislation or directives from governments at the moment.

EFFICIENT WATER USE

To address water use in the dairy farm (including practices to minimise effluent volumes) and management of the farm water system (to ensure secure water supply for stock). The focus should be on using water as efficiently as possible and reducing water loss in operations. We have to generate extensive resources to educate our dairy farmers. We also need to ensure resources are both comprehensive and easy to use and do not hinder the financial sustainability. Where treated effluent water is used to irrigate a farm, we should ensure irrigators/farmers efficiently apply water complying with nutrition management plan.

GREENHOUSE GAS PRODUCTION

We should also ensure that our cattle's are well fed and well managed, thereby reducing the volume of greenhouse gases produced per kilograms of milk solids produced. Cattle are a major producer of methane gas. In fact, worldwide, livestock emits 37 percent of anthropogenic methane. Anthropogenic methane is methane produced by human activities, such as agriculture. Methane production is a natural part of the digestive process of cows and other ruminants, such as bison, sheep and goats. When the cow digests food, bacteria in the rumen, the largest of the four-chambered stomach, break the material down into nutrients in a fermentation process. Two of the by-products of this fermentation are carbon dioxide and methane. Any cut in the methane emissions would be beneficial. Experiments revealed another benefit of the gas-reducing supplement is increase in daily milk production by nearly three pounds of milk for each cow during the trials. The researcher anticipated the higher milk productivity from the herd. Since methane production is an energy loss for the animal, as per studies any decrease in energy loss, will increase milk production.

POLICY BARRIERS

Better for the environment, better for environment, and better for regional economies: Sustainable dairy farming sounds like a no-brainer.

But current environment policies certainly overlook the impact of Dairy farming both regulated and unregulated, making it more difficult than it needs to be, as there is no available concrete framework or consolidate guideline to look upon. Lax regulation of Dairy farms

allows them to take cost-reducing shortcuts that give them a competitive advantage, while Dairy development/research and support programs are not structured to establish a sustainable and environment friendly dairy.

RECOMMENDATIONS

The report includes four policy recommendations that can have a positive impact on the growth of organic dairy farms:

Government should customize risk-management programs for dairy. Legislations should include proposals for new risk management programs intended to protect environment as well dairy farmers from volatile conditions.

Government should increase funding for programs that support sustainable agriculture. Though there could be few programs already in existence, help and educating farmers regarding sustainable farming in various ways—reducing the cost of installation and subsidising sustainable technology, funding research on sustainable systems, or providing technical and financial assistance for conservation measures. Expanding these programs will further support sustainable milk production and rural economic development.

Government should fund and DDB along with CPCB should implement, programs that support regional dairy-system development. Sustainable and environment friendly dairy farms are important components of regional food systems, so programs that promote the expansion of these systems can also support the growth of the dairy sector for addressing sustainability issues. Promotion of different programs by local bodies and NGO's like customer awareness and for instance, by encouraging government schools to do their sourcing from sustainable dairy farms for mid-day meal, could spur the expansion of sustainable dairy production in many areas.