Forum: United Nations Environment Assembly of the United Nations Environment Programme

Issue: The Question of the Influence of Livestock Production on the Environment

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INTRODUCTION

The harmful environmental effects of livestock production are becoming increasingly serious at all levels--local, regional, national and global--and urgently need to be addressed. Extensive livestock production plays a critical role in land degradation, climate change, water and biodiversity loss.

DEFINITION OF KEY TERMS

Livestock**:** are domesticated animals raised in an agricultural setting to produce commodities such as food, fiber, and labor.

Pollutant**:** any substance, as certain chemicals or waste products, that renders the air, soil, water, or other natural resource harmful or unsuitable for a specific purpose.

BACKGROUND INFORMATION

Livestock and poultry farms generate manure, bedding, milk-house wash water, spilled feed and dead animals that, if not properly managed, can impact water quality. Animal manure and related byproducts contain elements that, under certain circumstances, might reach surface or ground water and cause pollution. The location of an animal operation plays a role in how pollutants may reach water and the magnitude of environmental damage. Animal production in grain deficient regions may generate manure nitrogen or manure phosphorus in excess of the assimilative ability of nearby land for manure application.

Air quality issues associated with confined animal operations are traditionally nuisance concerns, such as odors, but there is increasing focus on possible links between dust and other particulates, ammonia and hydrogen sulfide from animal operations and human health.

Concerns include the possible effects of ammonia and particulates on respiratory systems (e.g., asthma) and prolonged exposure to odors on mental health effects (e.g., depression).

Only a relatively few studies (e.g., Thu et al., 1997; Wing & Wolf, 2000) have attempted to measure health impacts of odors and air emissions on nearby residents.

There are scientific concerns about bioaerosols—tiny airborne particles that contain microorganisms or their byproducts—due to their potential for causing human and animal disease and microbial toxins. Bioaerosols may be released into the air by such practices as land application of animal biosolids, livestock wastewater spray irrigation, livestock wastewater injection or animal pen scraping. Other sources of bioaerosols include exhausted air from livestock confinement buildings, high winds that carry bioaerosols from open livestock wastewater systems and dust blown from outdoor livestock pens. Much more needs to be known about the possible connections between air emissions from animal operations and health of rural residents. The results from scientific studies of these linkages are likely to drive future environmental policies for animal agriculture in the United States.

In addition to direct emissions from cattle, the anaerobic decomposition of manure during storage produces methane, a greenhouse gas (GHG). GHG emissions from farm animals have increased during the last decades due to the overall increase in the number of livestock and the relatively low rate of adoption of technology to reduce emissions.

There are massive pressures on animal production to satisfy the deeply rooted demand for high value animal protein. These pressures are resulting in a major transformation of the livestock sector, from one which is resource-driven (based on available waste and surplus products) to one that looks aggressively for new resources. Surging demand for animal products, a liberalized trade environment, changes in national policies and rapid developments in the area of technology and information bring about a whole series of opportunities and risks. These are compounded by shifts in the level of decision-making, away from the centralized nation-state towards both the lower (community) and higher (international) level. The dynamics surrounding the livestock sector call for novel approaches for safeguarding international public goods, now and in future.

The driving force behind the surge in demand for livestock products is a combination of population growth, rising incomes and urbanization. The world's population is currently growing at 1. 5 percent; the growth rate is 1.8 percent in the developing countries and stagnating at less than 0.1 growth in the developed countries. The real incomes of consumers in the developing countries have doubled since the early 1960s. With the exception of the 1980s, per capita GDP has grown annually by over 3 percent per year.

Global livestock production has increased substantially since the 1960s. Beef production has more than doubled, while over the same time chicken meat production has increased by a factor of nearly 10, made up of increases in both number of animals and productivity. Carcass weights increased by about 30 per cent for both chicken and beef cattle from the early 1960s to the mid-2000s, and by about 20 per cent for pigs. Carcass weight increases per head for camels and sheep are much less, about 5 per cent only over this time period. Increases in milk production

per animal have amounted to about 30 per cent for cows' milk, about the same as for increases in egg production per chicken over the same time period

Grazing systems offer only limited potential for intensification, and livestock production is becoming increasingly crop-based. Thus, the importance of roughages as a feed resource is decreasing at the expense of cereals and agro-industrial by-products. There is an important species shift towards monogastric animals, mainly poultry and pigs. While ruminant meat accounted for 54 percent of the total meat production in the developing countries in 1970, this has gone down to 38 percent in 1990, and is projected to decrease further to 29 percent in 2010 (FAO, 1995). This species shift reflects the better conversion rates for concentrate feed by monogastric animals.

MAJOR PLAYER INVOLVED

All of these countries are the biggest livestock producers in the world, that is why they are mentioned in this section.

Asia

- China (The biggest one)
- Thailand
- Japan
- South Korea
- India

European Union

- France
- Germany
- The Netherlands
- Denmark
- Russia

Brasil

Food and Agriculture Organization of the United Nations

TIMELINE OF EVENTS

- 15,000 years ago: Domestication of dogs in East Asia

Nothing important, everything develops as natural. When population size increased, also livestock production increased.

RELEVANT UN TREATIES AND EVENTS

The Global Agenda for Sustainable Livestock

It aims at catalyzing multi-stakeholder action to improve the sector's use of natural resources whilst ensuring its contribution to food security and livelihoods.

The Livestock Environmental and Assessment Partnership

It focuses on the development of broadly recognized sector specific guidelines (metrics and methods) for measuring and monitoring the environmental impact of the livestock sector. It strongly relies on FAO's core analytical capacity and related databases.

The Mitigation of Climate Change in Agriculture (MICCA)

This programme strengthens FAO's longstanding work to address climate change in the agriculture, forestry and fisheries sectors and supports countries participating in the climate change negotiation processes within the United Nations Framework Convention on Climate Change.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

All of the treaties mentioned in the "Relevant UN treaties and events".

POSSIBLE SOLUTIONS

Strengthen the public-sector role: The first option is establishing stronger federal, state or provincial policies to encourage responsible growth of the animal industry in locations with less environmental risk. A uniform regulatory playing field across countries, states and provinces could reduce overall environmental risk. This option could include increasing commitment to implementing regulatory and incentive programs, including adequate funding for staff.

Expand systems research: There is a need for more systems-oriented research by the public and private sectors on the environmental impacts of agriculture. Increased public funding for this type of research would give decision-makers better information about the interrelationships of environmental/health, social, economic and legal/policy implications of animal agriculture. Results could identify solutions for different scales of farming and regional environments that take social/behavioral factors into consideration.

Target best management practices to the highest priority environmental concerns: This approach would target efforts to areas and farms with the greatest water or air quality

problems. Some types of animal agriculture provide a flow of goods or services that society values, including ecological services and possibly amenities.

Payments from government to producers to provide ecological services—known as "green payments"—have been suggested as a major new direction for farm policy. This targeted policy option could utilize the green payments idea to integrate ecological goods and services into agri-environmental policy to reach desired broader environmental outcomes.

Use market-like mechanisms to "get the prices right": This option involves public and private cooperation to explore and foster promising innovative arrangements that internalize external costs of the fair, i.e., off-farm impacts on neighbors, communities and the environment.

Legal reform: Many legal reform proposals have been put forward to provide the industry with some certainty or a "safe harbor."

These reform efforts generally fail because they are perceived as taking rights from one group and giving them to another without compensation or required action by the industry. The crux of this policy approach is the need for multiple parties—industry, scientists and the public through government—to act together. In exchange for some protection against complex and costly litigation, the industry supply chain would take specific responsibility for the handling of animal manure and other environmental impacts using recognized science-based methods.

Perceptions of Agriculture: Farmers are traditionally viewed as good stewards of the land and the environment, and enjoy a large amount of good will among the public. The public may be less tolerant of environmental and nuisance impacts of animal agriculture, especially larger units. Improved scientific understanding of the impacts certain management practices have on the environment and human health may change public perceptions.

Environmental Monitoring: It is often difficult to attribute specific efforts of farms implementing BMPs to environmental outcomes. Measurement challenges include time delays, influences of weather, and difficulties measuring and monitoring smaller and diffuse sources of pollution. Advances in measurement technology have the potential to drastically change our understanding of pollution sources and to create new systems of accountability. Such advances will reduce monitoring costs and likely make resulting information accessible to watershed and/or other groups concerned about the environment. Bacterial source tracking has been proposed as a method to determine not only the species, but also to pinpoint the specific flock, herd or community causing any contamination.

USEFUL LINKS

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2935116/
- https://en.wikipedia.org/wiki/Livestock
- http://www.choicesmagazine.org/2006-3/animal/2006-3-11.htm
- https://www.theguardian.com/environment/world-on-a-plate/2013/sep/27/environment-food-ipcc-emissions-greenhouse-gas-livestock-vegetarian-meat
- http://www.fao.org/livestock-environment/en/
- http://www.fao.org/in-action/enteric-methane/en/
- http://articles.extension.org/pages/8953/regulations-related-to-livestock-and-poultry-production
- https://www.epa.gov/agriculture/agriculture-laws-and-regulations-apply-your-agricultural-operation-farm-activity
- http://www.livestockscience.com/article/S1871-1413(10)00074-0/fulltext