BUILDING A GLOBAL AGENDA OF ACTION

IN SUPPORT OF SUSTAINABLE LIVESTOCK SECTOR DEVELOPMENT

Global Agenda of Action – thematic area
Zero discharge: towards full recovery of nutrient and energy from animal manure

Issue. Discharge of animal manure into the environment causes pollution of soils and water resources, as well as the emission of noxious gases. This result in public health risks (e.g. waterborne diseases), biodiversity losses and economic losses (e.g. water treatment costs). The issue is particularly acute where large number of animals are geographically concentrated and not connected to land where manure can be applied.

Definition. Nutrient and energy recovery encompasses any activity that uses the nutrients or energy embedded in animal manure. These include: direct use as fertilizer on crops or fishponds, processing into compost or compound fertilizers, use as a substrate in anaerobic digesters (biogas production), or a combination of these.

Basic facts and description of the issue. Total amounts of nutrients (N, P and K) in livestock excreta are as large or larger than the total amounts of N, P and K in synthetic fertilizers used annually. Improved animal diets and feed conversion ratios can contribute to reducing the share of nutrient available in feed that are excreted by animals (cf. note on Thematic Area 1). The nature of biological process by which animals convert feed into energy and body mass will however always result in the excretion of a significant share of the ingested nutrients. Between 50 to 90 percent of the nutrients contained in feed are not transformed into livestock products but turn up in manure. No more than 40 percent of N ingested by a dairy cow is retained in milk. In a similar way, about 20 to 30 percent of the dietary energy contained in feed is not digested by animals.

Traditional pastoral and mixed systems have since long used nutrient and organic matter in manure, as an input to agriculture or fuel. Recycling livestock manure is however particularly difficult when livestock production is concentrated in certain locations, limiting the opportunities to apply manure to crop land. Such concentration occurs because costs can be reduced by locating close to consumption centers and supplies of feed, or within the operational area of the required support industries. Most countries have experienced such geographic clustering, and struggle to manage the environmental consequences.

Impacts related to manure management are poised to grow, as confined livestock production expands rapidly and continues to concentrate in geographically limited areas. Inadequately handled manure causes nutrient (mainly N and P) runoff and leaching in both surface and ground water systems. Livestock manure also emits greenhouse gas (GHG), especially when stored in uncovered deep (anaerobic) lagoons and applied to land. Pig and dairy production are the main concern as they generate liquid manures or slurry which are difficult to manage. Slurry is often either directly discharged into open waters causing water pollution, spread on agricultural land in addition to chemical fertilizers, causing nutrient overloads, or is stored in permeable deep lagoons causing methane emissions and leaching.

Proposition. Technical options exist to recover nutrients and energy from manure but the economics of their adoption vary greatly with production systems and access to land, from net costs to net benefits. A zero discharge programme would need to be driven by the private sector through voluntary commitments, supported by public policies. To lower adoption costs, policies need to ensure that livestock densities within any particular area are kept within the absorptive capacity of available land. We need to better understand the reasons for industry agglomeration, and the policy tools which can balance geographic distribution. Technical and policy guidelines need to be developed, technologies be transferred and capacities developed.

Does this proposition receive the support of the Platform? Shall it be refocused on end-of the pipe manure management options (e.g. nutrient removal, anaerobic digestion)? What shall the relative roles of private and public sector be?

Scope, boundaries and scale. The primary target of the theme are medium to large intensive production units, where most of the production growth is expected to take place. Large number of small scale production concentrated in a limited geographical area (e.g. specialized livestock production villages found for example in Southeast Asia) can represent a substantial source of pollution but would not initially be the focus of the theme given the high transaction costs associated with addressing numerous producers.

Does this target group allow for optimal cost effectiveness of the GAA? How does it affect social and equity issues? Which species should receive priority attention (e.g. pig and dairy)?

Moving toward an objective statement. GHG emissions and nutrient loads are reduced through the recovery of energy and nutrients from animal manure. Cost-effective practices are adopted to prevent direct manure discharge into the environment or storage in uncovered deep (> 3m) manure lagoons.

Consensus is needed for the further development of such statement and in particular: the possibility to meet the target within the timeframe of the GAA and the need to narrow down the production systems and types of production units targeted in this Thematic Area.

Problem statement. Experience from previous projects and initiatives, including the GEF funded Livestock Waste Management in South East Asia project, show that awareness and technology are not the main constraints to improving animal manure management. In fact, technologies related to nutrient recycling (i.e., manure collection, storage, composting, drying, crop application) and energy recovery (anaerobic digestion) are widely known, although the level of expertise and dissemination vary from country to country.

Under growing pressure from civil society, governments are taking action to mitigate impacts but policy interventions are generally ineffective. Policies are based on a limited assessment of current practices and a poor understanding of the costs farmers have to bear in order to comply with mitigation regulations that are not tailored to farm structure and investment capacity. Furthermore, some countries have derived their policy frameworks for livestock from environmental policies addressing industrial waste, which are of a different composition and generally not adapted to energy and nutrient recovery.

Because enforcement of new policies is sensitive, and because environmental regulations can have a wider effect than the strict environmental issue they intend to tackle, there is a need to analyse their consequences. In particular, environmental policies will affect farmer's income and labor demand, with some consequences on rural development. To be effective, policies must be designed, targeted and phased in such a way that farmers are capable to gradually adopt new farm practices (and technologies) over time without too disruptive shocks in both, the financial and technical management of production units. Determining the consequences of environmental policies across different areas and farm structure is an important part of the policy process which must involve producers and civil society organizations.

Furthermore, there is a need to assess and control leakage: livestock production may move away from countries implementing stringent environmental policies to "pollution havens" where no such regulations are in place. The obvious reluctance to engage in practices that may harm sector and national competitiveness has limited progress.

Proposed activities

1. *Strategic analyses - (including policy and institutional analyses, methodology and investment guidelines)*

Build a Task Force for analysis and development. A task Force is created, with a central hub and a network of experts and partner institutions in the area of economics, political science, law, land planning, public health and waste management. Focus areas include:

- cost effectiveness of manure management practices;
- land use planning and zoning;
- tradeoffs between environmental, animal health and public health objectives related to manure management;
- constraints to the adoption of zero discharge strategy.

2. *Generation and sharing of local and global knowledge, experiences, and practices through R&D, dialogue, and dissemination*
   As above.

3. *Promotion of capacity building*
   Provide training in the area of policy analysis, policy formulation and consultation processes.
   Technology transfer in the area of manure management, with specific input from private sector and civil society organizations.

4. *Support to the piloting of new approaches within the livestock sector systems, stakeholders, and related value chains to test, validate, and transfer practices: and*
   Support policy development at national level. Provide specific analytical support to the less affluent countries participating in the project.
   Provide grants for the piloting and dissemination of novel manure management options, in the less affluent countries.

5. *Advocacy, including the promotion of sustainable livetock sector development within existing inter-governmental and other processes.*
   Communication on the sector's "zero discharge" objective.