

Manure: environmental policy, impact and business strategy

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ABSTRACT

A major political issue in environmental policy of the Netherlands is the restriction on and deposit of manure. The Dutch government has eventually chosen for heavy and short term production limitation. The strict environmental policy has severe impact on the production capabilities of Dutch farmers. Environmental restrictions lead to major decreases of production capacity in agricultural sectors (hog-industry, poultry etc.). The restrictions have several inducements: perceived environmental deterioration (decline of biological diversity, acidity of soil, phosphates and nitrates; 84% of all nitrates in soil and water are caused by Dutch agriculture, and 88% of all phosphates are caused by it (NMP3¹, 1998, based on 1995-situation).

Several strategies could be adopted to reduce environmental impacts:

- the use of environmental co-operatives;
- the use of tax and other financial incentives;
- the limitation of production of manure by legislation;
- processing of manure into new agricultural inputs;
- reallocation of production and dispersing impacts;

The paper confronts the strategic aims of governmental bodies with the profit-seeking behaviour (the opportunities and financial motivations) of major groups of stakeholders in Dutch agriculture. The central question of this paper is: 'To what extent is the Dutch policy on manure control adequate with respect to strategic alternatives that possibly exist?'. It tries to predict future development of Dutch agriculture under the condition of growing (behavioural) environmental limitations. The conclusion is that environmental co-operatives can facilitate changes in the direction of sustainability in a decisive way.

1. Introduction: the Dutch manure problem

Attention on environmental issues has been drawn in The Netherlands after World War II. Before the 60's, almost no limitations were created for business expansion and pollution, the manure problem didn't exist as a political item (Erisman & Monteny 1999). Expansion of livestock from the 50's on caused severe problems for environmental sustainability (Baarda 1999, Frouws, 1993). The problem of concentration and growth of regional environmental influences, due to production on

¹ Stands for: National environmental plan

large scale, is not a typical Dutch problem. For instance, hog production in North Carolina (US) has increased from 5 million in 1990 to 16 million in 1997, with devastating outcomes for soil and water quality (Innes, 2000).

Problems with respect to soil, water or air pollution, to which overproduction of nitrogen, ammonia and phosphates (not absorbed by natural production in crops or grasslands) contribute, made juridical interventions urgent. Not only pollution through the abundant produce of manure came high on the political agenda in the '80's. Observed intrusions on soil quality from the chemical industry and newly discovered highly contaminated sites from past business operations (for instance as to gas-factories employed far before the Second World war) led to public awareness of environmental deterioration.

Manure contributes to a more general problem of soil pollution, apart from the different impacts on air and water. Soil pollution problems were heavily underestimated at first instance. After the discovery of large chemical waste-dumps in the early 80's, a Temporary Soil Cleanup Act (1984) was proclaimed that vested liability for carelessly creating soil pollution. Within a few years, estimated retrospective clean-up costs mounted up to 100 billion Dutch guilders, leading to excessive governmental claims on public as well as private institutions. With respect to manure, 1984 was a landmark as well, because of the introduction of an Emergency Law on the Limitation of Hog and Poultry Production, which confined intensive meat production (Baarda, 1999).

As to industrial soil pollution the impossibility to prove unlawful acts (by the lack of clear governmental laws and policy) made necessary to adjust the Dutch law on Soil Protection. The Dutch Soil Protection Act (SPA) of 1987 (adjusted in 1992), plays a role in industrial as well as agricultural waste production. It aims at preventing soil pollution by regulating its use. It imposes several duties on the owner or user of soil:

- the necessity to take precautions;
- the duty to warn on accidents leading to or enlarging the danger of soil pollution;
- the duty to clean-up after spoilage of hazardous substances.

Since 1992, it gives governmental agencies the possibility to proclaim liability on soil pollution stemming from the past in situations in which the pollutant had been careless, measured on accepted business practice at the time of cause and available technical means (art. 75 of SPA). It gives *in addition* to governmental agencies the instrument to order clean-up to owners or long-lease tenants, even if causality cannot be proven or doesn't exist (art. 43 SPA). It puts the blame for environmental impacts even if the person who caused the intrusion on the environment cannot be found. The 'polluter pays' principle is omitted, thus creating the ability to prosecute.

The problem of contamination through manure surpluses is more volatile, it seems. The primary objective of the SPA, since 1987, is *prevention* of environmental pollution, from chemical as well as live-stock industry. It set standards on phosphate deposits per ha of soil and stimulated industrial processing of manure. The standards that were set in the '80's were at a level where at the introduction no surplus of natural fertilisers would exist. The reason for this was that the hog and poultry production would be severely put into trouble if for legal reasons manure could not be deposited anymore (Baarda, 1999). The permissive norms on manure deposit and

production have led to an increase of livestock during the years. For instance, in 2000 The Netherlands comprise more than 100 million chicken, 17 chicken for each inhabitant..

The Soil Pollution Act did not only limit the applicability of manure but also restricted the possibilities to deposit in time and place, which in itself made necessary extensive investments in storage capacity in sealed tanks, to prevent ammonia leaking to the environment. In the period 1987-1990, serious efforts were made to limit the manure problem and stabilise its environmental impacts through improved fodder practices and distribution of manure (Baarda, 1999).

To limit environmental impacts, especially impacts on soil quality (saturation, depending on the natural use of minerals versus the deposit of it), water and air (ammonia leaching) a Law on Fertilisers was implemented in 1987. It regulates the production of animal manure whereas the SPA regulates their usage (Frouws, 1999).

On the basis of the Law on Fertilisers, production quotation could be applied, farms can be relocated to less vulnerable areas, manure could be processed into fertilisers for internal use or for export. Financial retributions could be asked for setting up plants for transforming manure into high-graded products, or for energy extraction (Wiering, 1999).

The standards and the pace for elimination of the manure problem are themselves a consequence of a shifting policy and awareness of environmental impact. On the basis of the Law on Fertilisers a quotation system was applied that limited the amount of phosphate produced and distributed by individual farms. It obliged farmers to keep records of production of manure. In the '80's the problem of manure was primarily seen as a problem of processing (Frouws 1999). The possibilities to process are dependent on the type of manure.

As manure deriving from poultry can efficiently be transformed into good quality dung for export, poultry production is not severely influenced by a more restrictive policy on manure processing. With poultry no severe limitations exist for exporting. Hog manure has two major disadvantages compared with manure from the poultry industry. Industrial transformation or even transport cannot easily be realised in a cost-efficient manner. And second directive 92/118/EG limits the export of manure to poultry and horses. So it is prohibited to export hog manure, for several obvious reasons, the main being the possibility of exporting classical swine fever.

2. Shifting policies? From clean-up to prevention

The past centuries showed major changes in environmental policy with regard to manure treatment in general, and especially with regard to agribusiness. Whereas in the 60's Manure Banks, for transportation and distribution of surpluses, were created, in the 80's experiments were carried out for manure processing. The final goal was to create equilibrium between manure production and plant-usage, by systematically reducing manure production to ecologically sustainable levels in 2000 (or, with the delays that occur, during the '10's). The governmental policy was heavily influenced by pressure groups, well organised and settled in the agricultural landscape. The 'alara'-principle ('as low as reasonably achievable') was applied in a way that significant reduction on production levels didn't have to take place.

A major shift in governmental policy was caused by the occurrence of classical swine fever in 1997, with devastating consequences for the Dutch swine production and livestock. A law on the Restructuring of Hog production was passed, that limited the rights for hog production. The rights for hog production replaced the manure quotation system that was used, and will lead to a severe decline in the number of hog farms. The bill was passed despite strong protests from farmers and their

representatives and was motivated not only because of the overproduction and manure problem involved, but also on the basis of the EU Nitrogen directive. The standard set by the European directive implies a maximum of 170 kg/ha of nitrogen in 2002, of which The Netherlands would be in severe violation if extensive measures would not be taken. Discongruent environmental standards are in violation with GATT-rules too (GATT, 1961).

A 25% reduction of Dutch pig production is realised by buying the production rights of farms. It is obvious that the measures taken encounter continuous resistance. Four factors, stemming from the past, contribute to the resistance governmental agencies experience:

- continuous expansion of farms, leading to a smaller amount of farms with substantial manure-quota and penalties for excess manure production;
- substantial investments as a result of the implementation of environmental rules in stables, quota, fodder-procedures and soil insemination techniques
- debt financing by farmers for the reasons mentioned, that limits business income and possibilities to turn-around business and reduce scale.

For some of the hog-farmers a production reduction will simply result in bankruptcy, despite the financial compensation that is granted. It marks the change from production adjustment to production limitation and choice for a different usage of scarce soil resources.

3. Business operations and environmental management

Environmental measures have an impact on the business environment, just as the business environment has an impact on natural surroundings. At the end of the 80's considerations were made as to what extent firms should be let the freedom of choice for mitigating environmental impacts.

At the one side it was argued that only through control and coercion business would have to be forced to make necessary changes. Environmental groups favoured mass-balances, quotation and regular control of depositions by inspections of farms and other firms. This position was taken by labour unions too and was nourished by public indignation on environmental pollution (soil pollution in Lekkerkerk, waste on the banks of the river IJssel in Holland, Uniser (1983)). On the other side, there was a strong lobby by the employers in agribusiness and elsewhere for *voluntary, self induced* measures to reduce environmental impact of business operations. To operate, Dutch firms need an environmental permit or exemption. In 1992 the system that provided the environmental permits changed drastically and put the environment (and not only industrial development) in the centre of considerations. The principle of environmental care and responsibility set the direction for industrial deployment. As to soil pollution, sustainability meant the use of land in a way that future generations would be able to use it again, for *all* possible purposes (multifunctionality). In course of the 90's it became clear that strong public influence on business affairs in industry was not desirable:

- it leads to disproportionate effort of public agencies to account for and control business operations;
- it leads to additional costs and additional tasks to perform, that are not appropriate for governmental agencies (as to knowledge, goal and mission).

It's peculiar that in industry the provision of mass balances and mineral-bookkeeping is not prescribed, whereas in 'normal' Dutch agriculture a more strict system is

applied. The Minerals Accounting System (MINAS) aims at registration and levying taxes on surpluses of minerals produced. In general, end-of-pipe controls lack sustainability and *force* their impact on management's decision-making system.

For other sectors though, the implementation of environmental care systems was promoted. At the beginning of the 90's, the intention was to force the implementation of environmental care by means of legislation, for 12,000 firms. At the end of the nineties, 300 industrial firms are indirectly coerced to implement environmental care. The indirect motivation is by means of (and in accordance with principle no 10 of the declaration of Rio de Janeiro and the 'right-to-know'-legislation in the US) public environmental reporting (ch. 12 of the Dutch Law on Environmental Care).

So in general:

- enforcement of environmental care in existing agricultural businesses is more strict than in industry;
- The governmental choice is on coercion and production limitation, either directly or indirectly by putting a price tag on pollution;
- 'pollution prevention' is preferred to 'pollution control'.

The question was put central in this paper to what extent the choice for coercion and production limitation ultimately benefits Dutch agricultural development. To give insight in the relative benefits and disadvantages of the choices made, a more broad spectrum of strategic options has to be described. The applicability of the choices made ultimately depends on the desirability of the alternatives put aside.

3. Strategic options

The relationship between governmental agencies (advocating public goals on reduction of environmental impacts) and business goals can include one or more of the following elements (Bremmers, 1995):

- risk acceptance: accept environmental risks and their financial consequences (deterioration of soil, penalties etc.)
- risk reduction: reduce the impact of business operations on the environment.
- risk compensation

Risk reduction can be realised by means of:

- implementation of environmental care
- investments in environmentally sound facilities and in R&D
- production and output limitations

Risk compensation can comprise:

- insurance
- compensation of losses through creation of reserves or provisions

3.1 Risk acceptance

The option of risk acceptance has been rejected, due to stringent European regulations and a deteriorating environment. On the other side, the total abandonment of risks is an illusion, since every activity has consequences for sustainable development.

3.2 Risk reduction options

The choice has been on risk reduction by elimination of the problem to a significant extent. The emission of Nitrogen for 2000 and 2001 from 275 kg to 250 kg per ha per year for grassland and from 150 to 125 kg for arable land (Bruil & Bezemer, 2000). Till April 2000, about 1,600 Dutch hog farmers had shown willingness to sell their

production rights and pull down production facilities in exchange for limited financial compensation.

Increased environmental care can be applied too. In the past significant efforts have been made to decrease environmental impacts by investing in better feeding practices, stables and depositing procedures. The implementation of norms for environmental care on individual farms has to be supplemented by control-mechanisms and facilitated by financial means. The lack of financial means, abundant possibilities to evade monitoring and the lack of willingness and opportunities from farmers' organisations in implementing financial care in their businesses is yet another motivation to take coercive measures. The willingness to invest by the farmers is strongly connected with perceived economic benefits of the measures taken. Investments in environmental care are provided only if 'pollution prevention pays'. Payments consist of extra profits or a reduction in business risk or financial risk. The elimination of environmental risk as such doesn't seem to motivate for taking environmental measures. Rewards, in a business context, stem from reduction of inputs (use of animal feed for instance) or higher outputs. Higher outputs are only realised if positive environmental impacts are translated in higher rewards for end-products. Positive rewards can be created by means of fiscal and other financial investments, like acceleration of depreciation. Although improvements in environmental care could improve the competitive position of the industry (Withagen 1999), the perception of the impact of such measures is opposite to this.

Voluntary limitation of production of manure is a strategic option that is applied only if reductions in output-farming are compensated:

- financially, by buying production rights;
- commercially, by increased output of complementary products.

The reduction as such doesn't seem to benefit business goals, on the contrary. Pollution prevention doesn't pay by itself. The consequence is that the breaking-up of trade-barriers leads to reallocation of resources world-wide. As to the hog-industry, the pace of change has increased rapidly, due to the swine-fever catastrophe of 1997.

Processing of manure has not gained wide acceptance yet in the Netherlands. The ultimate reduction of livestock, that takes place now, couldn't have been necessary if, and only if, in an early stadium serious efforts would have been made to transform manure in valuable input. The hesitation on the side of the farmers will ultimately work against them, it seems.

3.3 Risk compensation options

Insurance as an option for influencing manure impacts on the environment is not appropriate since insurance presupposes *uncertain* future events. In the case of manure uncertainty is of no relevance. The creation of provisions and reserves to compensate damages is feasible either for two reasons: the lack of control, the intransparency of benefits and the lack of scale (compare: Svendsen et al, 1999).

At first glance it seems that the choice for coercive measures by the Dutch government is the only way out of the marshland of animal deposits. The execution however lacks the approval of agricultural organisations. Without such approval, the basis for further improvement of environmental quality is lacking.

4. Conclusions

Environmental co-operatives are organisations that try to implement environmental goals for the members that are involved. Environmental co-operatives can help in the

provision of means for the attainment of environmental goals. It can serve as an intermediary at an environmental market. At the environmental market supply and demand for environmental quality (Mighels & Hagelaar, 1994). It serves the environmental functions of farm-firms by means of:

- organisational change
- investment in control and mitigation of environmental impacts
- bargaining power in negotiations with governmental agencies.

The joining of an environmental co-operative means the opportunity and the duty to come to an agreement on internal and external environmental goals. It limits the strategic business opportunities. It can serve the goal of restricting environmental outputs as well as counterpart in price-negotiations. Higher standards could influence competitive power of farm-firms by creating strategic advantages

Increasingly, farmers employ ecologically sound side-activities to increase income. Taking up such activities can reduce higher opportunity costs of land in use for extensive livestock with higher value added, in tourist industry and preservation of original landscapes. Why not work together with farmer-organisations to gradually transform the business in the direction of environmental sustainability and more productivity than was feasible in the past?

Of course, limitations in output are inevitable to be sustainable. But to be able to survive, intense working on common goals of governmental as well as farmer organisations are necessary. The Dutch agricultural sector has shown in the past a lack of togetherness and initiative to change the course of things. Only a reformulation of private and public policies can help. The answer to the question set in this paper is therefore: the recent policy lacks institutional embedding to connect shrinking with growing in a more meaningful way. One way, not exhausted, out of the dark manure tunnel is by means of environmental co-operatives.

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