Towards an Improved Environmental Reporting Structure for Companies in Food and Agribusiness Chains

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Abstract

The present paper focuses on the perceived quality of information exchange between government and business (G2B) in the field of environmental reporting in the Dutch agrifood industry. It seems most important for environmental performance enhancement (a concept that includes the quality of information given to stakeholders in our view) that companies are entangled in a network of intermediary institutions (branch organizations, covenants, existence of chain leaders etc.). It seems that that these mediating institutions are very instrumental in translating the governmental message to the companies. The companies choose the (related to the development of internal care) improvement of electronic reporting as the most promising innovation for the G2B communication. This shows that the companies still have a long way to go towards chain oriented care systems.

1. Introduction

The present paper focuses on the perceived quality of information exchange between government and business (G2B) in the field of environmental reporting in the Dutch agrifood industry. The research on which this paper is based is part of a longer-term research project that aims at restructuring information systems for food and agribusiness companies. The problem this paper addresses is the reasons for the absence of a coherent system for environmental reporting in the Dutch agrifood industry. Several factors may cause the limited environmental reporting

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performance of companies: top management's traditional view on (the importance of) environmental care and a negative attitude towards governmental legislation in combination with external circumstances (e.g. low profitability and absence of market growth; compare: Prakash 2001, Rowley 1997, Scallon&Sten 1996, Steger 1988). Central to our research is the stakeholder-theory (see, for instance: Clarkson 1995). According to Clarke (1999), the most important stakeholder for corporate environmental care systems is the government, but is the governmental policy decisive in what companies do? To Madsen and Ulhøy (2001), the companies' managers play a crucial role as mediators for stakeholder influence. The more managers are convinced of the profitability of environmental measures, the more they will be willing to adopt them ('pollution prevention pays', among others, Bremmers, Hagelaar & De Regt, 1996), and the more they will be willing to relay the company's environmental performance.

The Dutch government's policy is permissive towards companies that include environmental care systems in their organization. Environmental permits are given with more freedom to act, and a more goal-oriented attitude takes the place of a control-oriented attitude. We therefore hypothesize that the more companies look at governmental agencies as partners, the more they are willing to adhere to governmental goals and disclose environmental information.

The research questions addressed in this paper are: 1) What are the determining factors for environmental performance in the agrifood chains? 2) To what extent do role perception and information quality of governmental agencies determine the level of environmental performance, and 3) what devices should be implemented to improve environmental G2B performance?

2. Environmental care in the Netherlands

The implementation of reporting duties in the Dutch environmental law system is strongly connected with the urge for improvement of environmental care (Compare: Rugman& Verbeke 1998). In the early eighties of the last century, several incidents and discoveries of environmental damage induced a discussion about the relationship of business activities and the natural environment. Over the years, more duties to 'take care' were included in environmental legislation (like in the Environmental Care Act (ECA, 1992). The ECA provides a legal framework for governmental agencies to plan and control environmental improvement. From the governmental plans, norms for environmental damages and improvement were (and are) derived. For a few years now, a limited number (250-350) of companies with severe dangers to the environment are obliged to publish an environmental report. One of the functions of the environmental report is to replace fragmented disclosure on environmental issues to the government (among others: Bremmers 1995). Environmental reporting duties enforce the development of an internal environmental care system (compare Gray 1993, Tosserams 1991). A complete

system consists of the following elements: commitment (declaration of intent by the management, program of actions), compliance, control (regular measurements of output, administration and auditing) and communication (both internally and externally; Bremmers 1995). The enhancement of self-regulating capabilities is stimulated by Dutch environmental legislation. Actually, a major part of the environmental report concerns the progress the organization makes in developing an environmental care system. Governmental principles that serve as a foundation for this are the 'polluter pays'-principle, internalization of environmental care, prevention at the source and usage of the best available techniques (compare: GRI 1999).

2.1 Environmental care levels

In the present paper, we distinguish between three levels of internal environmental care and one level of chain management care: the level of sanitary oriented, process oriented, product oriented and chain oriented care. The levels of internal environmental care are comparable to the stages discerned by Van Koppen and Hagelaar (1998): the clean-up stage, the process-control stage and the product-focus stage. In the clean-up stage, no clear care system exists (see also: Braakhuis cs 1995, Kolk&Mauser 2002). The focus is on simple 'house-keeping'-measures. Legal prescriptions serve as a guideline for business policy. The aim is short-term improvement of business operations. In the process-control stage, environmental measures are integrated in the operational performance of the company. The product itself is not modified (compare: Huizingh 1989). In the product-focus stage, increasing attention is paid on product- and process redesign. Environmental reporting clarifies the position a company takes with respect to the environmental strategy it has adopted. It can accelerate the pace of environmental development by showing the benefits of environmental care ('pollution prevention pays') and public pressure to environmental neutrality. The level of chain management care includes the care for the physical flows as well as co-operation with the other partners in the supply chain.

Each level of environmental care is composed out of five variables. Each of the variables is measured using a 5-point Likert scale. Questions that were included in the care indexes are:

Sanitation level; company profile: static, reactive and defensive
- information collection as acute problems occur
- information gathering for obligatory reports
- information collection to check upon emissions
- environmental audit
- traceability of raw material
Process oriented level; company profile: dynamic, controlling
- Information collection to control internal processes

- Environmental action programme available
- Education and information of personnel
- Measurements on a regular basis
- Traceability, focusing on business processes

Product oriented level; company profile: internal organization and product focus
- Information collection for internal environmental care
- Information collection for product redesign
- Environmental strategy/policy available
- Environmental information system/database available
- Regular internal reports

Chain oriented level; company profile: external (stakeholder and chain) relations focus
- Information collection for chain environmental care
- Information collection for exchange with suppliers/customers
- Traceability of environmental impacts in product chain
- Meetings with suppliers/customers on environmental issues
- External environmental reporting

3. Data Collection and Response

Via the Dutch Chambers of Commerce, the addresses of 2,627 companies were acquired, being all the companies active in the agrifood industry with 5 employees or more. In 2002, to each company a standardized survey questionnaire, consisting of 135 precoded questions, was sent. Before the data collection started five experts validated the questionnaire. Their comments were incorporated into the questionnaire. In order to ensure uniform interpretation, definitions of the variables were included in the questionnaire. The questionnaire contained questions about the level of environmental care and the perceived quality of (G2B) environmental information exchange. 590 companies (a response rate of 23%) returned the questionnaires. About 100 questionnaires could not be used, so 492 questionnaires were analyzed using SPSS 11.0.
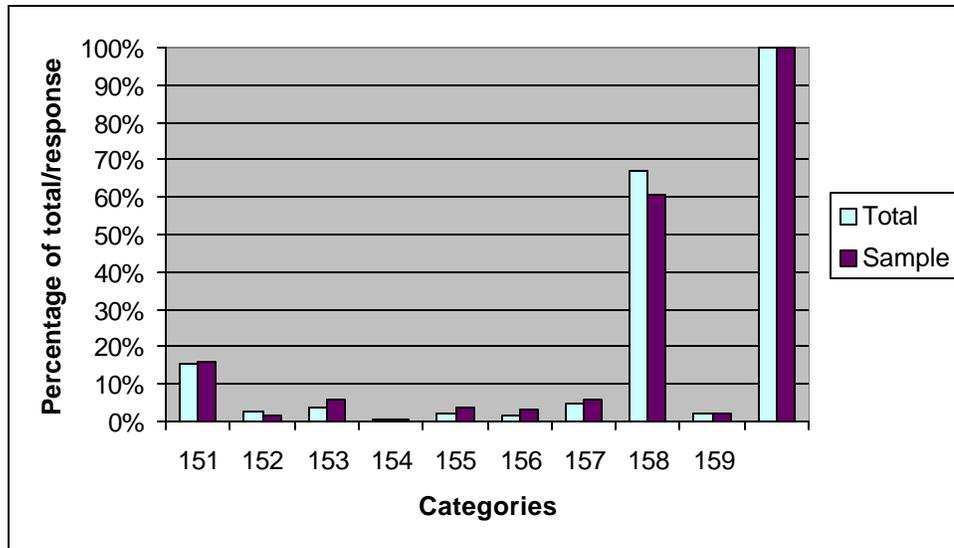
4. Results

Figure 1: Comparing the sample with the total agrifood population

151 = meat; 152= fish, 153= vegetables & fruit, 154=oil & fat, 155=dairy, 156= flour, 157 = animal feed, 158= other, 159=liquor (Dutch Chamber of Commerce categorization)

If we compare our sample with the total number of companies in the different categories as distinguished by the Dutch Chamber of commerce, we see that the figures almost overlap (see figure 1). We therefore assume, that the empirical findings, presented in this paper, are representative for the companies in the different categories of the Dutch agrifood industry. However, with respect to size (measured by means of number of employees) we have noticed a bias towards the bigger companies. Small-sized companies (sales 2001 < €1 mln) didn't respond equal to their representation in the sector. A major cause is (to our guess) that environmental care has only limited connection to business continuity, combined with the lack of professional staff to fill in the form. By excluding the small companies when needed, the sample is made representative for the population of the bigger companies in the agrifood industry.

4.1 Environmental care system and reporting

Table 1 shows, that about one-quarter of the companies indicate to have an environmental care system in place that includes an environmental strategy, audits and regular measures of environmental impacts, that are reported internally to the company's top management and the employees. About one-fifth of the company's has education and training programs and environmental actions programs to train the employees how to deal with environmental risks. However, only 15% of the companies have an elaborate information system, cq environmental database and reports externally on a regular basis.

Table 1: Elements included in environmental care system (N = 492)

Elements included	
Environmental strategy	25.9 %
Environmental audit	25.9
Regular measures	25.4
Internal reporting	21.0
Education and training of personnel	20.2
Environmental action program	18.0
External reporting	15.4
Information system/environmental database	14.7

These results are in line with the fact that nearly 85% of the companies in our sample indicate that they don't publish an external environmental report. Only 73 companies publish an environmental report, either directly or via the parent company (5.4%). Another 40 (8.2%) are working on it (see table 2).

Table 2: External environmental reporting in the Dutch agrifood industry(N= 486 + 6 missing values)

Environmental report published by the company	57	11.7 %
Environmental report published by the mother company	16	3.7
Environmental report in development	40	8.2
Not necessary	373	76.7
Total	**486**	**100 %**

Table 3: Subjects included in environmental reports (N=73)

Subject	Included in environmental report	
Environmental facilities and measures	64.8 %	
Quantitative information on material streams		64.8
Environmental policy	53.6	
Permits and covenants	49.2	
Investment level in environmental care	43.7	
Environmental impact ratios	40.8	
Environmental performance indicators	22.5	
Sustainability aspects	11.3	
Life cycle analyses	5.7	
Other subjects	4.2	

We asked the 73 companies that currently report on environmental issues externally, which subjects are covered in their environmental report (see table 3). Nearly three-quarters of the companies provide information on environmental facilities and measures, as well as quantitative information on material streams. About half of the companies provide information on legal aspects, permits and covenants, while about 40% is clear about the investment level and the environmental impact ratios. Nearly one-quarter provide information on the environmental performance indicators used. A minority of the companies informs

about sustainability aspects, and provides data about the results of life cycle analyses of their products.

4.3 Determining factors for environmental care and information performance levels
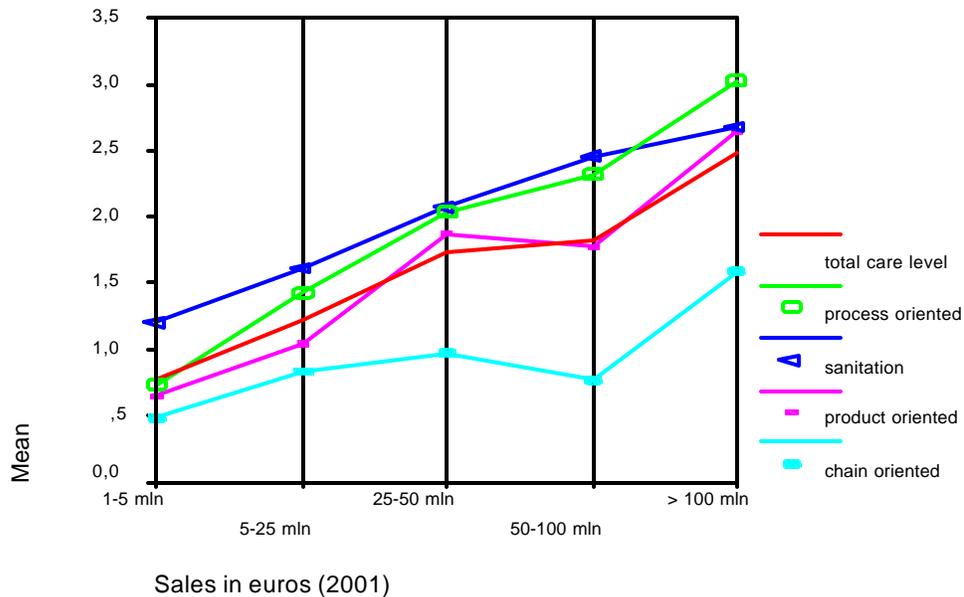

Figure 2: Different levels of environmental care (sanitation, product, process, chain and total care level (5-point Likert scale) versus annual sales volume in Euros (> 1 mln euro, N =286)

Figures 2 and 3 show, that the levels of environmental care are still very low in the agrifood industry, even in the bigger companies with an annual sales volume of over 1 million Euro. The level of care increases as the size of the companies increase, but the total care level does not go above 2.5 at a 5-point Likert scale. Interestingly, the hight of the level of environmental care seem to drop in the category 50-100 mln (N=25) and then rises again. This results can at least partly be explained by the fact that this category contains relatively many companies from the category slaughtering and meat processing. While t-tests indicate, that there is no significant difference in care performance between this category and the other categories, they perform relatively better on sanitary oriented and worse on product oriented and chain oriented care. Probably, given the abundant amount of sanity oriented regulations -such as HACCP, and ISO-, sanitary oriented care might be most synergetic to accepted business practices in this category, while product oriented and chain oriented environmental care are not considered as urgent, given the stage of 'internal orientedness' of companies in the 'differentiation stage' of their corporate development.

We found a high and significant Spearman correlation between environmental care and information performance (.684, P2-tailed < .01, N=57). If we concentrate at the 73 companies that report externally, we still see that both the environmental care

level of performance are, as well as the environmental information performance is still quite low in the agrifood industry. Further analysis on explaining the environmental performance level (using independent t-tests, ANOVA, factorial analysis and multiple regression) has led to the conclusion, that one of the most important explanatory factors for the environmental care level of a company is the level of prioritization of environmental care by the top management. The present study could not find evidence that structural factors, like competition in the market or effectiveness of governmental environmental communication, could explain the total care level of a company. With a composite variable (including clearness of rules, subsidies, uncertainty perception etc.) the company's perception of the quality of governmental communication was measured. When this measure was correlated with total care level the Spearman's rank correlation appears was relatively low (.208). The existence of intermediary institutions (branch organizations, chain-leaders) seem to influence the total care level positively . In addition, B-2-B-companies, that are entangled in a business network (N=88), reach significantly higher levels of environmental care than companies that sell solely to consumers (N=199; mean levels .5028 vs. 1.5289, p < 0.01, two-tailed).
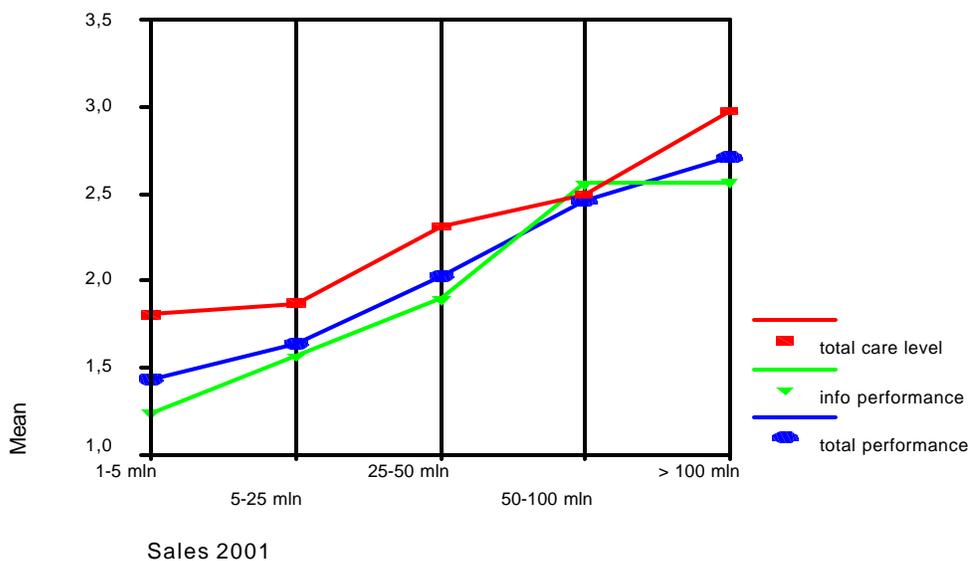

Figure 3: Total environmental care, information performance and total performance level versus annual sales volume of companies that report externally (N=73)

Note: 'care level' denotes the score on development of environmental care system, while info performance denotes the level of development (information included etc.) of environmental reporting. Total performance is defined as the sum of these two.

We asked the companies to assess the governmental role with respect to the promotion of environmental care within the companies (ranging from obstructive to proactive) and correlated this with the performance with respect to environmental care. Interestingly, no correlation at all was found for this factor (P2-tailed .072, N =

258, not significant). In contrast to our hypothesis, it seems that the environmental care level is for a significant part independent from the positive or negative perception by the company's management about the governmental role perception and perception of communication on environmental care.

4.2 Possibilities for improvement of environmental reporting using ICT

We assessed the significance of four possible innovations to improve the environmental reporting using ICT for 92 companies (with annual sales volumes > 50 mln Euro in 2001). We proposed 4 possible innovations in the information architecture:

- environmental permits for the chain in total in stead of individual business units;
- environmental reports for the companies in the chain in total, in stead of environmental permits per business unit;
- integration of obligatory reports from a chain focus;
- electronic environmental reporting.

We measured preferences on a 5-point Likert scale (no improvement at all – very much of improvement). The data that are included in figure 4 show, that the innovation oriented to internal environmental care, namely electronic reporting is preferred by most of the companies, while the improvements suggested at chain care level score significantly lower.
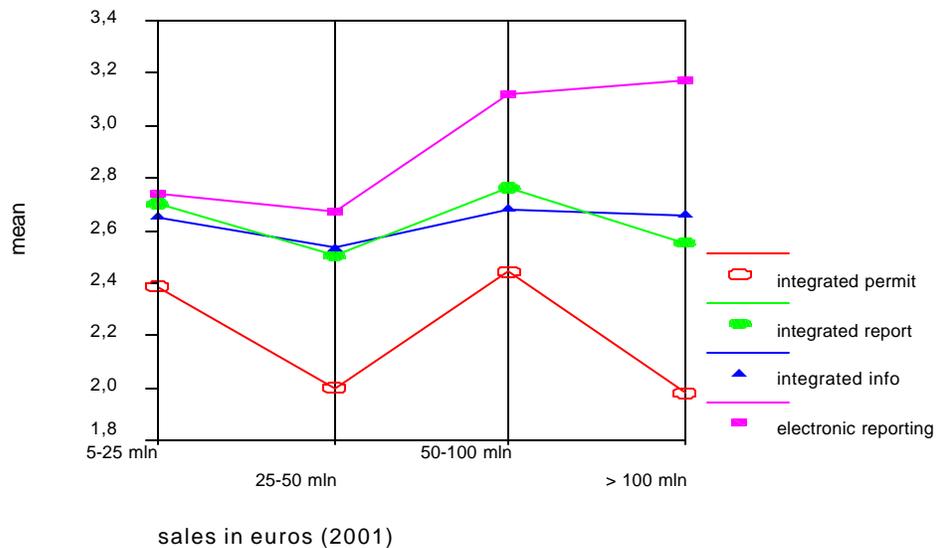

Figure 4: Preference of innovations to improve environmental reporting versus annual sales volume (companies > 5 million Euro, N=92)

5. Conclusions

The overall level of environmental care is still not very high in the Dutch agrifood industry. Even the 73 companies, that provide external reports, do not score higher than 3.0 on a 5-point Likert scale, with respect to environmental (total) performance. Probably, external circumstances, such as low profitability and high competition, prevent companies from being very pro-active in implementing environmental care systems. Although, as expected, the level of environmental care improves as companies become bigger, there is an interesting dip at the level of companies with an annual sales volume of 50-100 million Euro. Looking deeper into the data, we conclude that in this category we find relatively many companies from the category slaughtering and meat processing. Probably, given the abundant amount of sanity oriented regulations -such as HACCP, and ISO- sanitary oriented care might be most synergetic to accepted business practices and developed competences (Hart, 1995) in this category. The results show, that in contrast to our hypothesis, the positive or negative attitude of the company's management towards governmental regulation is not decisive for the level of environmental care that is reached by the company. It seems much more important that companies are entangled in a network of intermediary institutions (branch organizations, covenants, chain leaders etc.). It looks like that these mediator organizations are very instrumental in 'translating' the governmental 'message' to the companies. It is therefore recommended that, governmental agencies to be effective should concentrate more on the informational role of the mediators than on putting more effort on convincing the companies themselves. The companies choose the internal-care-system –related improvement of electronic reporting as the most promising instrument to improve the G2B communication. Although it is obvious that this is the innovation that is most easy to implement, it shows that the companies still have a way to go towards chain oriented care systems.

Acknowledgements

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