

Environmental management in transnational corporations in Asia: Does foreign ownership make a difference?

Preliminary results of a survey of environmental management practices in 154 TNCs

By Michael W. Hansen

Occasional paper no. 11

Report as part of UNCTAD /CBS Project:

**Cross Border Environmental Management
in Transnational Corporations**

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Background to paper

The globalization of economic activity in general, and the growing role of transnational corporations (TNCs) in particular, have increasingly directed attention toward the environmental consequences of these developments. Increasingly, TNC activity in developing countries has become an issue for various normative initiatives at the international level, in the OECD and in the WTO. However, there remains a pertinent need to gain a better understanding of the environmental implications of TNC activity in developing countries. On this background, the United Nations Conference on Trade and Development (UNCTAD) and Department of Intercultural Communication and Management, Copenhagen Business School (DICM/CBS) in 1997 received a grant from the Danish International Development Agency (DANIDA) to conduct a study of environmental practices in TNCs. The project is called: "Cross border Environmental Management in Transnational Corporations". The project examines environmental aspects of foreign direct investment (FDI) in less developed countries by conducting case studies on environmental practices in Danish and German TNCs with operations in China, India and Malaysia. The project will produce a series of research reports on cross border environmental management seen from home country, host country as well as corporate perspectives. The reports will serve as input to a conference on Cross Border Environmental Management hosted by UNCTAD.

Abstract

This report presents the preliminary results of an extensive survey of environmental management practices in 154 TNC affiliates in China, Malaysia and India. The survey is unique, both in that it focuses specifically on TNC practices in developing countries and in that it emphasizes cross border aspects of environmental management, that is the involvement of headquarters in the day to day environmental management activity at affiliates. One of the main conclusions of the survey is that 'institutional' factors, such as the local regulatory regime or the corporate governance system of the TNC, are much more important to affiliate environmental managers than for instance factors associated with markets, or NGO and media pressures. In particular, headquarters plays an essential role in the environmental management activity of the affiliates in developing countries and the survey identifies various mechanisms through which headquarters exercises this influence.

Please note that the views and opinions expressed in this paper reflect those of the author and do not necessarily represent those of UNCTAD and CBS.

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Environmental management in transnational corporations in Asia: Does foreign ownership make a difference?

Preliminary results of a survey of environmental management practices in 154 TNC affiliates in Malaysia, India and China

By Michael W. Hansen¹

I. Introduction

Transnational corporations (TNCs), the organizational embodiment of foreign direct investment (FDI), provide one of the most important links between developed and developing countries. Through trade, capital transfers, technology and know-how transfers, and through organizational links, transnational corporations increasingly bridge economies of North and South.

At the fore of debates on the role of TNCs in development, are discussions of the effects that foreign investors may have on local industry and market structure, on technological capacity, on human resource development and on broader social and political conditions in developing host countries. Developing countries are increasingly experiencing the classical side effects of economic transition and growth, for instance cultural upheaval, social disruption, and environmental deterioration. As FDI by TNCs play a pivotal role in the economic transition process of a growing number of developing countries, it is only natural to ask to what extent TNCs reinforce these problems or on the contrary help abating or even solving them. These questions are not only the concern of developing host countries. Consumers and NGOs in the North are increasingly focusing on the social and ethical aspects of globalization, and the role of TNCs in developing countries is an issue of particular concern. For both audiences in the North and the South, it is thus essential to understand the effects of FDI, the configurations under which beneficial outcomes for host countries materialize, and the configurations under which FDI affect host countries adversely.

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a. FDI and the environment

One of the areas where the interest in the effects of FDI of both developed and developing countries appears to have converged in recent years, is in the area of environmental protection. For developing countries, the interest stems from severe environmental problems created by rapid industrialization and urbanization. Transnational corporations may play a pivotal role, both by augmenting these problems and by solving them. In developed countries, the interest in the environmental effects of FDI is rooted in fears that TNCs are transferring environmental problems to developing countries and/or that environmental measures for foreign investors may inhibit access to the emerging markets of developing countries.

The debates over TNCs and the environment have focussed on numerous dimensions, e.g. whether developing countries constitute 'pollution havens' for OECD investors with severe environmental problems; whether the environmental practices of developing country subsidiaries of TNCs are inferior to those of the home countries; whether the environmental practices of TNCs restrict market entry for developing country producers; or whether TNCs may significantly facilitate a transfer and diffusion of cleaner technology and know-how to developing countries.

b. The research questions

This report will illuminate some of the debates on TNCs and the environment by focussing on environmental management practices in TNCs. The report provides preliminary results² of a comparative survey of environmental management practices in 154 TNC affiliates in China, India and Malaysia. The survey focuses on four categories of questions:

- *What is the scope and content of environmental management at Asian TNC affiliates?*
- *To what extent do TNC affiliates extend their environmental management practices beyond the factory gate, to include suppliers, subcontractors or local communities?*
- *What is the effect of foreign ownership on environmental management practices at Asian affiliates?*
- *What factors constrain and facilitate improved environmental management practice at TNC affiliates in Asia?*

The report presents preliminary statistical findings of this survey. More detailed accounts of the economic and regulatory context of the three Asian countries can be

2. Financial information from headquarters together with seven additional questionnaires from TNC affiliates in China will be included in the database before the final version of this report can be prepared.

found in three context reports³. Detailed case studies of TNC environmental management practices in the three Asian countries can be found in three case study reports⁴.

c. Methodology

1. Why focus on TNCs

As mentioned above, TNCs may be central players in regard to environmental dimensions in developing countries both as problem creators and as problem solvers. For this reason, it is considered worth while singling out TNCs as the unit of analysis and examine, how TNCs manage environmental dimensions at developing country affiliates. The focus on environmental management has the advantage - seen from both a research and policy perspective – that environmental management is a cross cutting and generic function that applies to all TNCs with environmental impacts. While several studies have illuminated environmental management aspects of TNC activity seen from a home country perspective⁵, very few studies have actually analyzed the dynamics of environmental management at developing country subsidiaries of TNCs.

2. Data collection

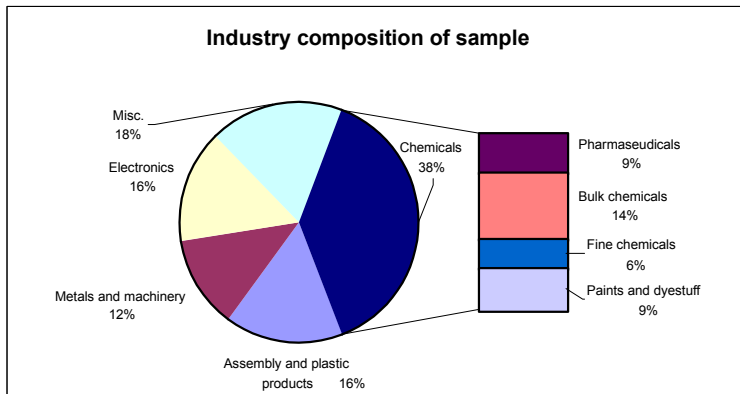
The data was collected in 1998 and 1999. A questionnaire with app. 50 questions was developed (see annex 2) and send to app. 250 affiliates in each of the three TNC host countries. The questionnaire consisted of questions with finite answer categories (typically 'yes', 'no', or 'no answer') and a free format field for each question, where the respondents could elaborate on their answers. Apart from information on environmental management practices, the survey provides general information on the investment project, e.g. investment motive, age of facility, sector, home country, and size of the company. This general information provides a basis for identifying explanatory variables and making statistical controls.

3. For the Malaysian context, see Rasiah, Rajah, Transnational corporations and the environment: The case of Malaysia, Occasional paper no. 4, Cross border environmental management project, CPH: Copenhagen Business School, 1999. For the Indian context, see Jha, Veena, Investment liberalization and environmental protection: Conflicts and compatibilities in the case of India, Occasional paper no. 1, Cross border environmental management project, CPH: Copenhagen Business School, 1999. For the Chinese context, see Guoming et al, Cross border environmental management and transnational corporations: The case of China, Copenhagen: UNCTAD/CBS Occasional Paper Series no 3, 1999.

4. For India, see Ruud, Audun, Islands of environmental excellence, CBS/UNCTAD: CBEM Occasional Paper, forthcoming 1999. For Malaysia, see Pedersen, R.J., Local adaptation or global integration – TNCs in midstream, CBS/UNCTAD: CBEM Occasional Paper, forthcoming 1999. For China, see Guoming et al, Cross border environmental management in China: Local adaptation or global integration, CBS/UNCTAD: CBEM Occasional Paper, forthcoming 1999.

5. In 1993, UNCTAD issued a report on environmental management practices in 169 TNCs. This study focused exclusively on practices of headquarters (UNCTAD, Environmental Management in TNCs, UNCTAD, 1993). For a review of other studies, see Hansen, M.W., Cross border environmental management in transnational corporations. An analytical framework, CBS/UNCTAD: Occasional paper no.5, 1999.

In many cases, it was necessary to make on-site interviews in order to obtain responses; in fact most of the questionnaires from India and China are generated in that way. App. 50 companies from each country responded. The responding

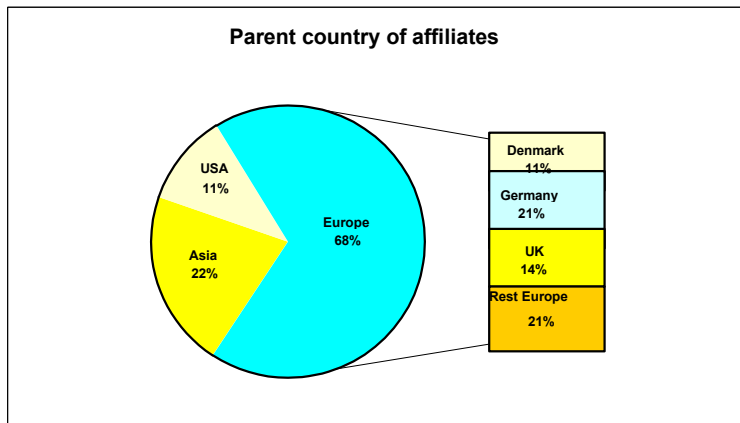


companies were all granted anonymity; without this, it would have been impossible to get sufficient responses due to the perceived market, legal and political sensitivity of environmental issues. It must be acknowledged that the participating companies – typically represented by

environmental or plant managers - spend considerable time filling out the questionnaire.

The survey targeted industries that can be expected to have significant environmental challenges, most notably the chemical sector (including pharmaceuticals), the electronics industry, the textiles industry and the metals and machinery sector. App. 2/3 of the respondents are from these industries. With 38% of the sample, the chemical sector – including pharmaceuticals, bulk chemicals, specialty chemicals, and paints - is by far the largest group.

The survey focussed on TNC affiliates in three Asian developing countries, namely India, China and Malaysia. 53 companies were located in India, 42 in



China and 59 in Malaysia. The reason for choosing these three countries was an assumption, that host country characteristics such as environmental regulatory system, infrastructure, culture and level of economic development significantly influence TNC environmental management practices. The

three countries obviously vary in regard to the type of environmental challenges that they face, as well as in terms of the way that they address environmental problems. Also in terms of general business climate and approach to foreign investors, the three countries differ significantly⁶. By targeting three countries that in terms of environmental regulation and approaches to foreign investors differ significantly, the survey opens for comparative analysis of the relative effects on environmental practices of various host country characteristics.

6. See the three context reports for detailed accounts of similarities and differences between the three countries in regard to FDI and environmental regulation.

The survey targeted European firms. Thus, 67% of the respondents come from Europe. The sample is in that sense unique – most of the previous research on TNC environmental management practices have focussed on US companies. The largest European country in the sample is Germany followed by the UK. These two countries are also the two largest European foreign investors. A disproportionate share of the respondents is from Denmark. This country, ranking 15th in Europe in terms of FDI outflows, was targeted in order to obtain substantial information on companies from a small OECD country. Within the designated industries, it was not possible to obtain responses from enough European firms, and firms from other TNC home countries were subsequently included. Of the non-European countries, 11% were from the US and 22% from Asia. Among the Asian countries, 11% were from Japan and the remaining companies from Taiwan, Malaysia and India.

The profile of investment from the different TNC home countries varies: Measured in term of number of employees at affiliates⁷, the Danish sample consists of mainly very small projects whereas in particular the US sample mainly consists of very large affiliates. This may reflect differences in industry structure in the various home countries.

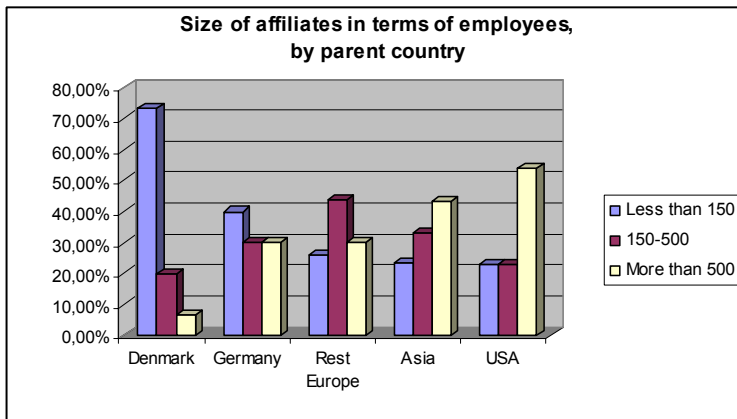
3. Generalizations

This survey represents without doubt the hitherto most extensive survey of environmental management practices of Asian affiliates of OECD based TNCs⁸. In that sense the survey provides an excellent first impression of the environmental practices that TNCs devise outside OECD countries. Nevertheless, it should be emphasized that the findings should be interpreted with caution: First, the survey focuses exclusively on environmental management practices. Underlying this focus is of course an assumption that environmental management practice and environmental performance are closely related. However, due to the immense methodological problems of measuring environmental performance in developing host countries, no attempt to validate whether environmental management practice actually transforms into better environmental performance has been made.

Second, the fact that the response rate was low (app. 20%), makes it likely that there is a significant over-representation of environmental leaders among the respondents. The implication of this is that absolute numbers regarding environmental management practices will have to be interpreted with caution. The main strength of the sample is that it allows for conclusions regarding relative performance of TNCs, depending on their home and host country, their industry, their size, and their investment motive.

7. In the present draft, it has not been possible to include financial information from the affiliates and their parent. In the final version, headquarters financial information will be included in the analysis.

8. Other studies include Jenkins, R., Trade, investment and industrial pollution: A Malaysia case study with some Mexican comparisons, IKMAS Working Paper, Malaysia; IKMAS, forthcoming 1999; ESCAP (Economic and Social Commission for Asia and the Pacific) and UNCTC (United Nations Centre on TNCs), Transnational corporations and environmental management in selected Asian and Pacific developing countries, Bangkok:United Nations, 1988;Brown, H. et al., Corporate Environmentalism in a Global Economy: Societal values in international technology transfer. Conn.: Quorum Books, 1993.



Third, the usual limitations concerning reliability of surveys based on a questionnaire apply to this survey as well. A particular reliability problem arises from the fact that many of the responding managers do not have English as their first language and thus may have misinterpreted the questions.

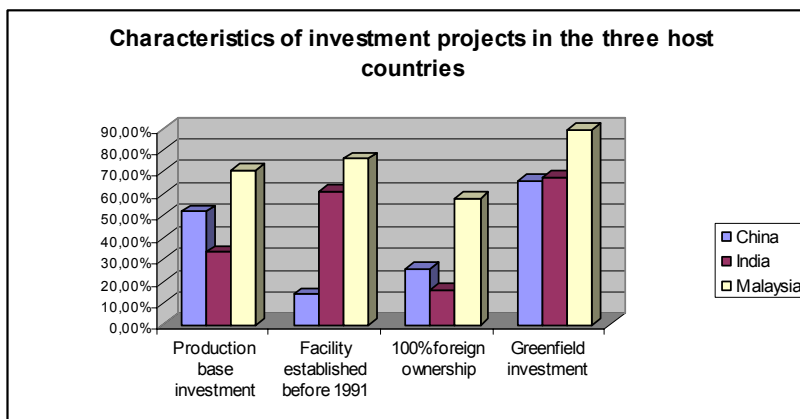
In fact, in the case of China, it was necessary to translate the questionnaire into Chinese. Another reliability problem is related to the fact that the survey exclusively relies on responses from TNC managers. Thus, the report alone gives the TNC version of the story. In three subsequent reports, detailed case studies from Malaysia, China and India will substantiate the statistical findings of this study, and through interviews with external stakeholders provide checks on the validity of the conclusions derived from responses from corporate managers.

d. Summary

A key element in understanding TNC effects on developing host countries is their environmental management practices. This study endeavors to examine the scope, content and dynamics of environmental management in developing countries. The study is based on a survey of environmental management practices in 154 TNC affiliates in the three Asian developing countries India, Malaysia and China. Although various limitations in terms of generalizations apply, the sample nevertheless provides a unique basis for getting a first impression of the nature of TNC environmental management in Asia.

II. Investing in Asia: Characterizing the investment projects

OECD FDI in Asia has surged within the last 10 years. The investment is however unevenly distributed among the Asian countries. This uneven distribution partly reflects differences in locational advantages of the Asian economies, partly that these countries are pursuing different industrialization strategies, spanning from extremely outward oriented strategies assigning FDI by TNCs a central role to more inward oriented approaches treating foreign investors in a more cautious manner. The three host countries represent such differences in market conditions and industrialization strategies: Where India and China potentially and also to some extent in practice have very large home markets, the Malaysian market is relatively small. Also market entry regulation in the three countries varies significantly.



Historically, entry to the Indian market has been very difficult due to various import restrictions. In many cases, FDI has been the only way for foreign firms to circumvent these 'entry barriers'. However, also the inflow of foreign capital to

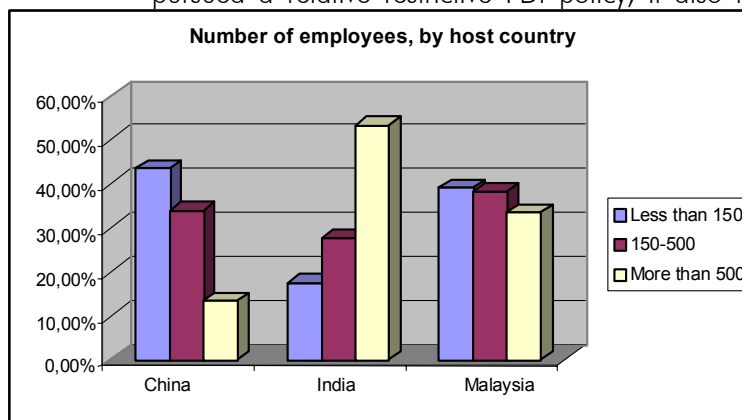
India has historically been relatively low, something that at least up to the New Economic Policy (NEP) of 1991 could be explained by strict trade and investment measures imposed upon foreign investors. On the other hand, Malaysia has especially since the early eighties successfully pursued an aggressive export promotion policy and vigorously sought to attract foreign investors as part of that strategy. From the late 1980s, China has opened the gates for foreign investors, and although various entry barriers remain, China has been extremely successful in attracting the recent surge in FDI so that close to 40% of total FDI in Asia is placed in China.

The different market potentials of the three countries as well as the variations in FDI regulation are reflected in the sample. Thus, whereas more than 2/3 of the respondents in Malaysia reported that they had invested to exploit favorable production conditions such as low labor costs – so called production base investment - this was the case for less than 1/3 of the Indian respondents. The remaining investment projects were mainly motivated with market access although a small proportion, especially among the Malaysian investors, reported that access to raw materials had been a motivating factor (Table 1). It is frequently argued that low environmental cost may be an important motive for investment in developing

countries. This is the so called 'Industrial Flight' to 'Pollution Havens' hypotheses⁹. Thus, among the potential investment motives cited in the questionnaire was 'lack of environmental standards and controls'. However, no respondent reported to have invested for this reason, which is hardly surprising given the political sensitiveness of such a statement.

The nature of the three host countries investment regulation is also reflected in the sample. Thus, Indian FDI regulation has historically been relatively restrictive, aimed at protecting national industrial development and ensuring maximum local diffusion of TNC assets. For instance, up to the 1991 NEP, most foreign investors were required to establish joint ventures with private or public partners. Reflecting this, only 16% of the Indian projects have 100% foreign ownership, compared to 58% of the Malaysian projects. Related to this observation, it was found that a relatively large proportion of the Malaysian investment projects (90%) are green field projects.

A final variation between Indian, Malaysian and Chinese foreign investors that can be attributed different sequences and contents of industrialization strategies and FDI policies, concerns the age of the investment projects. Albeit India historically has pursued a relative restrictive FDI policy, it also has a longer history of FDI than



especially China, which only opened up for FDI in earnest in the late 1980s. Consequently, a relatively large proportion of the Indian investment projects and a small proportion of the Chinese projects are established before 1991. The variations in maturity of investment projects could also

help explain that the size of the investment projects in the three countries varies significantly. Thus, the Chinese sample is characterized by relatively small operations, whereas the Indian sample is characterized by relatively large operations measured in terms of number of employees.

Summary

From this characterization of the nature of investment projects in the three countries, it is clear that the sample reflects different market structures as well as approaches to foreign investors in the three countries. This information is important to keep in mind when we now move on to characterize the environmental management practices of the TNC affiliates; it can be hypothesized that there is a

9. Leonard, H.J., *Pollution and the Struggle for World Product: Multinational Corporations, Environment and International Comparative Advantage*, Cambridge: Cambridge University Press, 1988.

close connection between the nature of the investment projects and environmental management practices.

III. Environmental management practices at affiliates

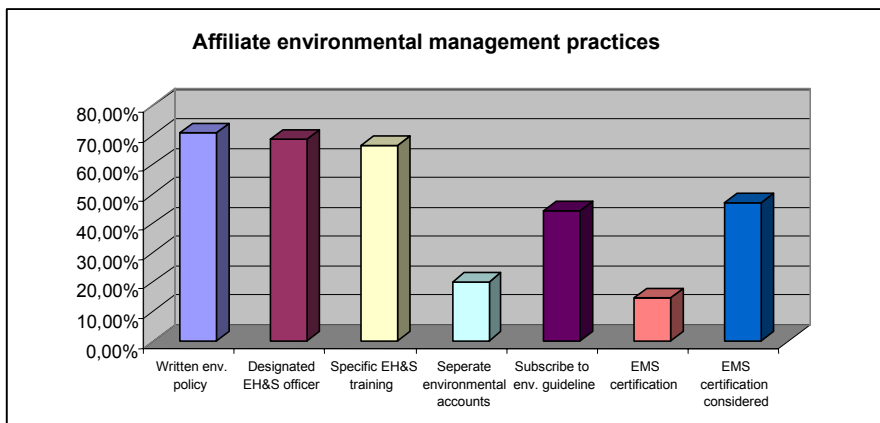
In this section we will seek to characterize the environmental management systems at affiliates. First, the section will examine the scope and content of practices such as the adoption of environmental policies, environmental accounting, environmental training or certification according to an environmental management standard. Subsequently, the section will examine to what extent environmental management practices are extended beyond the factory gate, to suppliers and subcontractors as well as communities at large. Finally, the section will examine what kind of barriers to improved environmental performance the sample TNCs experience.

a. Environmental management systems and procedures

Although there is no evidence that the sample TNCs have invested in Asia in order to exploit lower environmental control costs, it is probable that the three countries to varying degrees provide incentives for companies to operate with lower environmental standards than in their home country. This could be due to enforcement problems, lack of environmental infrastructures or lower environmental standards¹⁰. Corporate self-regulation in the form of environmental management may in this situation be particularly important as a way of alleviating the effects of regulatory failure. The survey illuminates the scope and content of such environmental management practices.

1. Written environmental policies

An environmental policy is a brief internal code of conduct conveying the



general principles and main objectives underlying the environmental conduct of a company and is the bridge between the general attitudes of the company toward the

10. See the three context reports for detailed accounts of the nature of environmental regulation in the three countries and the problems related to implementation of environmental legislation.

environment and its operational levels. An environmental policy can be an important signal to employees and stakeholders including the public that the company is serious about environmental protection. Most of the sample have an environmental policy in place (70%). However, the environmental policies were rarely formulated at the affiliate; 2/3 of the companies having an environmental policy reported that it was formulated by headquarters.

2. Designated environmental officers

A first step in building an environmental management system is to designate responsibilities for environmental, health and safety matters. Close to 70% of the responding companies had a designated environmental officer, in particular the largest projects (Table 2), and projects in the chemical sector (Table 3).

3. EH&S training programmes

47% of the respondents reported to have specific EH&S training programmes in place. Many of these programmes are related to the transport and handling of

Areas where regular EH&S training activities are conducted	
• Awareness training and initial training in the ISO 14001 standard for certification	• Issues of leaks, fire, and transport management.
• Chemical Handling.	• Machine operation and safety
• Chemical Mgt.	• Occupational Health
• EH&S training programme for trainees.	• OH&safety
• Environment (operation & maintenance)	• Power saving
• Equipment handling	• Regular course on fire mgmt.
• Fire fighting	• Safety procedures.
• Fire preparedness	• Transport.
• Transport and handling of chemicals.	

chemicals and safety issues and it was found that 70% of the respondents in the chemical sector had such programmes in place. Environmental training activities took various forms. Several companies reported that they had initiated environmental training and awareness

programmes as part of their endeavor to become certified according to an environmental management standard. Two companies reported to have specific programmes for trainees. In most cases the training programmes appeared to be organized and conducted in house, however a few companies reported to have external consultants and experts conducting the training activity.

4. Separate environmental accounts

Separate environmental accounts were relatively rare among the sample companies; only 21% reported to keep such accounts. The most notable variation was that 1/3 of the Chinese TNC affiliates reported to keep separate environmental accounts (Table 4).

5. Subscription to international environmental guidelines

The respondents were asked whether the company is subscribing to any national or international environmental guideline ? 44% reported to subscribe to such a guideline. They were in order of appearance the chemical industry's Responsible Care Programme, the environmental management standards (ISO 14000 series, EMAS and BS 7750) and the WHO Good Manufacturing Practice

11. Controls have been made for industry and home country.

Programme. Interestingly, the ICC Business Charter for Sustainable Development did not figure prominently among the cited guidelines; only one US respondent reported that it subscribes this guideline. This low number is surprising taking into account that many of the participating TNCs are subscribers to the Charter. It could indicate that the Business Charter mainly is relevant for HQ overall strategic and marketing purposes, not the more operational activities of subsidiaries.

The survey examined the scope and content of certification according to the environmental management standards ISO 14000 series, EMAS and BS7750 in detail. Only 14% of the respondents reported that they are certified according to an environmental management standard. This was in most cases the ISO 14000 series, and only a few companies referred to BS7750 and EMAS. There was a close correlation between companies being certified according to a quality standard and an environmental management standard, a finding suggesting that environmental management is a natural extension of a strong quality orientation (Table 5). Among those not being certified, several reported that environmental dimensions were already included in their quality management system.

Surprisingly, 32% of the metals and machinery sector reported to be certified but only 10% in the chemical sector (Table 6). One explanation for the high level of certification among producers in the metals and machinery sector could be that the automotive industry within this sector is an exceptionally integrated industry with complex production networks and a high degree of inter-firm collaboration. It appears that the integrated production networks of this industry may have facilitated the adoption of environmental management standards. The explanation for the low degree of certification in the chemical sector could be that this sector, due to the immense environmental risks associated with chemical production, has established elaborate environmental management systems long before the advent of the international environmental management standards and that this sector may regard the international environmental management standards as inferior to those already in place in the sector. In particular, it was interesting that only one of 14 pharmaceutical companies were certified according to an environmental management standard. One explanation for this could be that this industry, prompted by stringent FDA regulation, already has established elaborate quality and environmental documentation procedures.

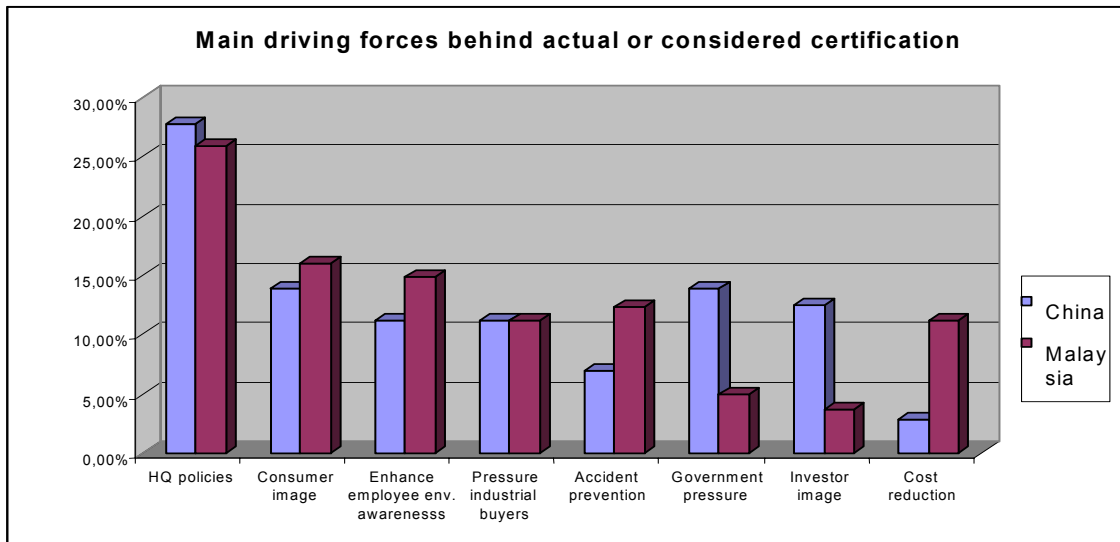
While only 14% of the respondents were certified, an additional 46% are considering to become certified. It thus seems that environmental certification is an issue firmly placed on the TNC agenda, even at affiliates in developing countries.

In the case of Malaysia and China, it was examined what were the driving forces behind actual or considered certification. Thus, the respondents were asked to prioritize a list of factors that may motivate certification. It was found that the most frequently cited motivating factor was headquarter (HQ) policies, procedures and standards; 27% of all cited investment motives were HQ policies, procedures and standards (see figure) and more than 50% of the respondents had HQ policies,

12. Controls have been made for host country and industry.

procedures and standards as their first priority (Table 7). Government pressure appeared less important although this factor was significantly more important in China than in Malaysia.

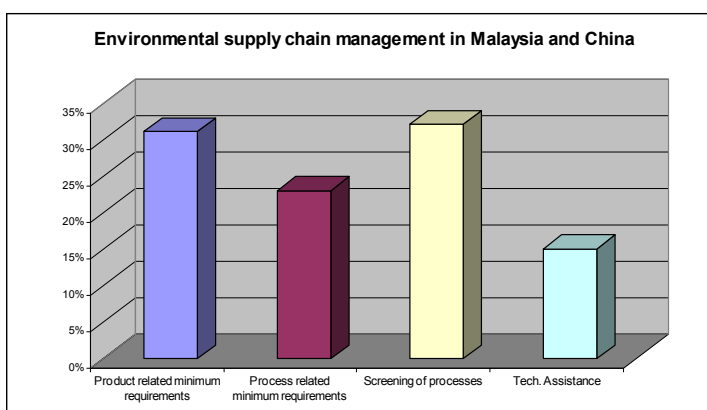
Market factors in the form of consumer image and pressure from industrial buyers ranked relatively prominently (together, 26% of all cited motivating factors fell within these two categories). In this connection, it could be hypothesized that these two types of pressures are particularly important in export oriented affiliates.



This because access to OECD markets increasingly demands documented environmental management systems in place. This hypothesis appears to be validated based on the sample. Thus, production base investment projects were significantly more inclined to cite consumer pressure and in particular pressure from industrial buyers as the primary motivating factor behind actual or considered certification than were investment projects aimed mainly at local market access (Table 8).

b. Linkages to the local community

In the more optimistic accounts of FDI impacts on developing host countries, it is suggested that TNCs, through linkages to local firms, to authorities and to the local community at large, may play a vital role in the transfer and diffusion of environmental know-how and technology. Thus, one of the focus areas of the survey was how TNCs manage the environment beyond the factory gate, that is, their linkages to suppliers and subcontractors and to local communities. The survey explored this question by focusing on two aspects, namely the management linkages to local suppliers and subcontractors and the nature of interaction with local authorities and local environmental NGOs.



1. Supplier and subcontractor linkages

The implications of the proliferation of non-equity links

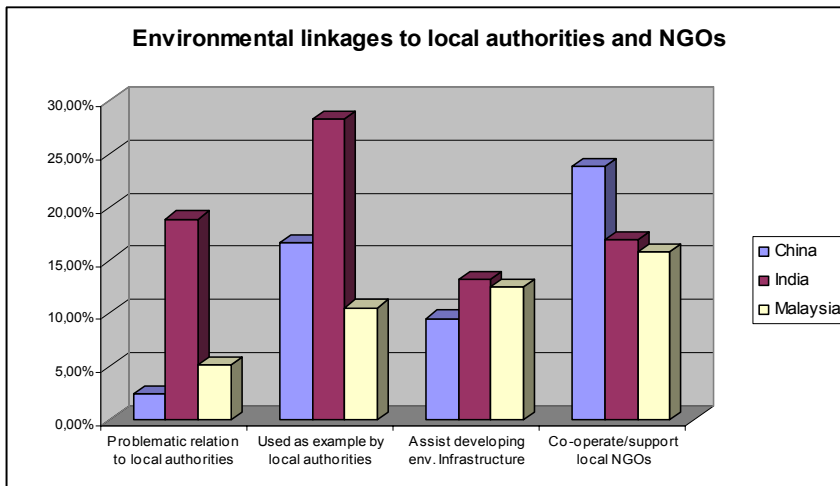
in general and integrated production networks in particular have rarely been analyzed from an environmental perspective. Environmental supply chain management is particularly important in the context of developing countries. If the environmental dimension of the supply chain is ignored in developing host countries, it could be suspected that TNCs, while remaining clean within the factory gate, outsource their environmental problems to local suppliers and subcontractors. Various environmental procedures and practices for environmental management of the supply chain can be identified. A typical tool employed by some of the largest TNCs is to set environmental minimum requirements for products and services delivered by suppliers and subcontractors or setting minimum standards for processes. Another frequently employed tool is to screen environmental performance of suppliers and contractors, e.g. by requesting them to fill out a questionnaire, where they report on various environmental dimensions. On-site environmental assessments can also take place, typically as part of a quality assessment. On rare occasions, TNCs may offer technical assistance regarding the solution to environmental problems to suppliers and subcontractors.

The scope and content of environmental supply chain management was examined in Malaysia and China only. 44% of the Malaysian and Chinese affiliates reported that they are setting environmental minimum requirements for supplier and subcontractor environmental performance. The respondents were asked to specify the nature of these requirements, that is whether they were related to products and/or process and/or waste management. The majority of companies were primarily setting standards for products and services; 31% reported that they set minimum requirements for environmental aspects of products. 23% reported setting process related minimum requirements for suppliers and contractors. However, 32% of the respondents reported that they are conducting environmental screening of processes of local suppliers and subcontractors; for companies certified according to an environmental management standard this number was 70%. 22% reported to set standards for waste management. This was typically in cases where waste management was contracted out. 15% reported that they offer some sort of technical environmental assistance to suppliers and subcontractors. This assistance were related to designing of environmental training programmes, establishing wastewater treatment facilities, providing formats and standards for the environmental quality of products, or providing specific assistance upon request.

The complexity of involving suppliers and subcontractors in the environmental management system is enormous, and environmental supply chain management is a relatively new exercise in industry. It was therefore expected that only a small proportion of the respondents would be involved in such practices. In accordance with this expectation, the overall impression from the survey of Malaysian and Chinese affiliates was that environmental supply chain management is rather embryonic, conducted in an ad hoc manner and mainly related to products.

2. Linkages to local authorities and NGOs

18% of the respondents reported that they had been 'used as an example by local environmental authorities on how to solve specific environmental problems'. The respondents specified that this demonstration effect took place, when for instance the company received an environmental award or was mentioned in environmental authorities' promotional material. Some respondents reported that authorities sometimes brought guests from other firms to demonstrate a particular technology and more generally, that their environmental technology had been used



by the authorities as a model for other firms in the industry. One company mentioned that its approach to solving a particular environmental problem had been used as a case study by local authorities in workshops and manuals and a

handful of companies reported that they had participated in technical committees on environmental standard setting. Interestingly, almost 50% of the US companies reported that they had been used as an example by local authorities, something that could be explained by US companies being more PR conscious but also that they may see the strategic advantage of having a high environmental profile in the local community.

12% reported that they had assisted building local environmental infrastructures. This activity included creating green belts in industrial areas, giving other companies access to waste treatment facilities, or assisting in financing and building local waste treatment facilities.

The evaluation of local environmental authorities in the three host countries was generally positive; 58% found the relationship 'good' and 24% found it 'very good'. In fact, only 10% stated that the relationship was 'problematic'. Interestingly however, 1/5th of the Indian respondents found the relationship to local authorities 'problematic', something that could indicate a somewhat more adversarial regulatory climate in India. Among the reasons cited for this relationship being 'problematic' were random or non-existing inspections, lack of enforcement, weak qualifications among inspectors, lack of follow up on inspections, or outright extortion.

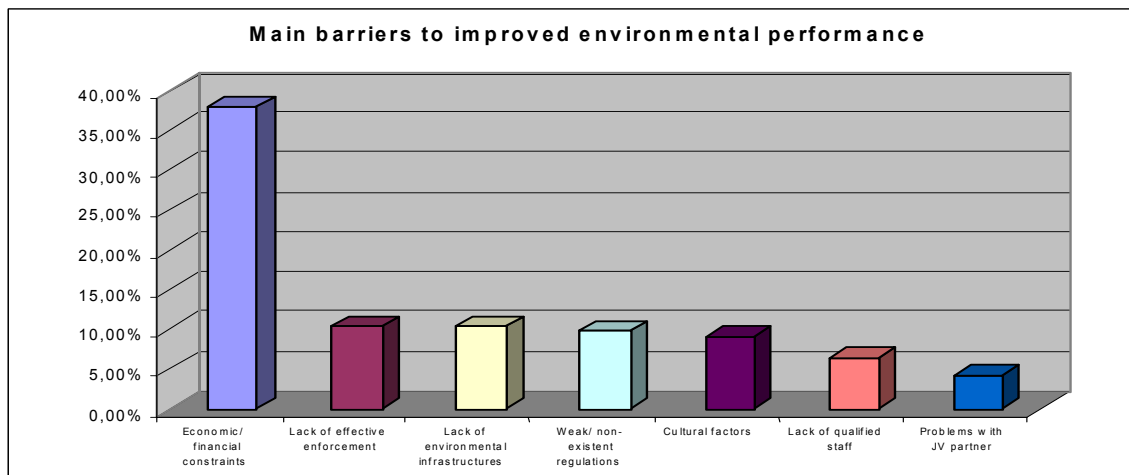
Although the respondents generally evaluated local authorities positively, it should be added that 46% of the respondents stated that they felt that they, having foreign equity, were subject to significantly stricter enforcement than were local

companies. Here an interesting variation is evident; in China 64% of the respondents felt that way as compared to 33% in Malaysia¹³.

18% reported that they cooperate and/or support local environmental NGOs. This activity spanned from simply 'responding to their questions', to collaboration in connection with building environmental infrastructures, training in connection with safety measures around the plant, support of local tree planting programmes, or membership of local conservation NGOs. Several affiliates reported that these activities were an outcome of their product stewardship programme.

c. Barriers to improved environmental performance

The respondents were asked to prioritize a list of seven major barriers to improved environmental performance at affiliates. Almost 40% of the respondents cited economic and financial constraints as the most important barrier. This finding is hardly surprising; the affiliate manager will typically find the options for

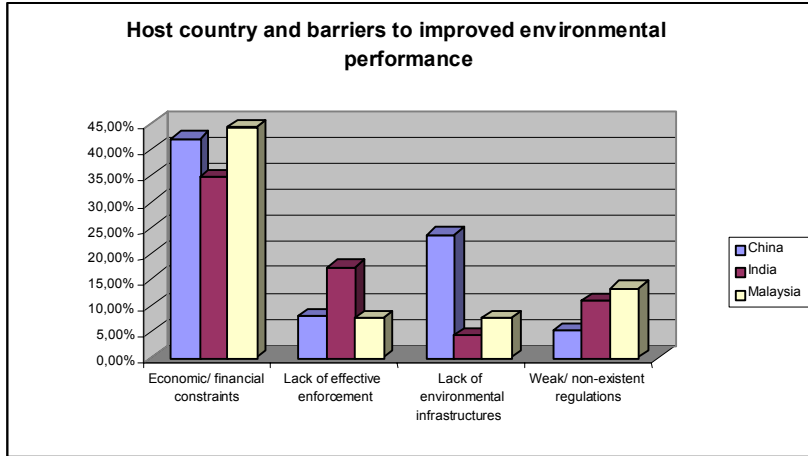


environmental investment severely constrained by the financial objectives set by headquarters or by competition in the market. Obviously, the smaller affiliates are more likely to cite this barrier than are the largest (45% among those affiliates with less than 150 employees versus 35% among those affiliates with more than 1000 employees); for SMEs it might be more difficult to obtain scale economies and offset environmental costs.

Apart from financial constraints, the main barriers were associated with the local regulatory set up; the second most commonly cited barrier to improved environmental performance was 'inefficient enforcement of regulations', followed by 'lack of environmental infrastructures' in the host country and 'weak or non-existent regulations'.

13. This question was not asked the Indian sample.

There were interesting variations in the cited barriers to improved environmental performance between the three host countries; 22% of the Chinese respondents cited lack of environmental infrastructures as the most important barrier but only 10% of all. This finding suggests that China may have problems meeting the



infrastructural demands of the astonishing surge in FDI of the last decade. 17% of the Indian respondents cited lack of effective enforcement as the main barrier compared to 10% of all respondents, a finding that is consistent with the previous observation

that a relatively large proportion of Indian affiliates evaluated the relationship to local environmental authorities as 'problematic'. Moreover, while only 4% of all respondents cited problems with the joint venture partner as the main barrier to improved environmental performance, this number was 11% in India. This finding is interesting, not so much because the number is relatively high for India – this reflects that a relatively large proportion of the Indian respondents are joint ventures (85% compared to 65% of all) – but rather because this factor appears relatively important among joint ventures; in India, 16% of the companies with 50-60% foreign ownership and 25% of companies with 60-99% foreign ownership reported that the relationship to the joint venture partner was the main barrier to improved environmental performance (Table 8). Thus, while joint ventures for various reasons may be beneficial to the TNC as well as the host country - such as accessing local market knowledge and expertise and enhancing diffusion effects – it also seems that joint ventures can create significant frustrations in terms of implementing objectives of improved environmental performance.

d. Summary

While environmental management activities appear to be in place at the vast majority of TNC affiliates, it was only a small proportion that actually had become certified according to an environmental management standard. Interestingly, however, almost 50% of the responding companies are considering to get certified according to an environmental management standard, a finding suggesting that certification is a practice in the process of spreading to non-OECD countries. Although around 1/3 of the respondents have established environmental procedures related to suppliers and subcontractors, this relation seems rather 'shallow' in the sense that it is little formalized and mainly is concerned with environmental aspects of product quality. In regard to local authorities, the antagonistic relationship often depicted in media and academic accounts, cannot be corroborated; generally, TNCs are pleased with the collaboration with local environmental authorities. Nevertheless, it should be mentioned that local regulatory failure - such as lack of enforcement, lack of infrastructures or lack of environmental regulations - was the most frequently cited barrier to improved environmental performance.

IV. The home country connection: Cross border environmental management

A special aspect of environmental management at TNC affiliates in developing countries concerns the management relation to headquarters. This is what we will label 'cross border environmental management'¹⁴. In devising parent-affiliate environmental relations, the strategic question for the headquarter (HQ) is to what extent environmental management of subsidiaries should be integrated in the TNC's overall environmental management system and strategy, or rather retain a high degree of local independence. There are advantages of both integration and local adaptation. Cross border integration increases control and minimizes risks, and uniformity in management approach may create scale advantages thus reducing costs. Decentralization and local adaptation may increase local responsiveness to specific local conditions, and minimize costly reporting and control activities.

14. Hansen, M.W., Cross border environmental management in TNCs, An analytical framework, CBS/UNCTAD: Occasional Paper no.5, 1999.

a. Policies, standards and targets formulated by headquarters

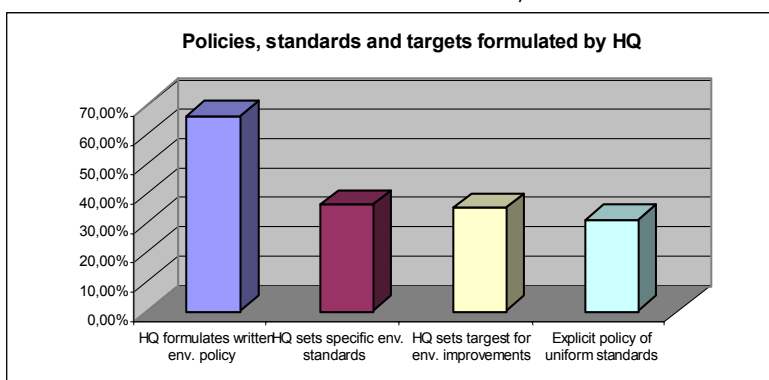
At its most basic level, a cross border environmental management system may consist of some general principles for the environmental activities of the entire corporation. These principles are typically stated in the corporate mission or as it is sometimes labeled, 'the environmental policy statement'. The overall principles may be accompanied by more specific policies and programmes that are applicable throughout the corporation. These policies and programmes will typically exist in areas that the corporation assigns particular importance, e.g. energy conservation, waste-minimization or air pollution. Sometimes specific company wide targets for reduction of pollution emissions or consumption of raw materials will be stated in such policies. Finally, it is possible that headquarters formulate internal standards applicable to all subsidiaries, e.g. standards for air emissions, workers exposure to hazards, or standards for wastewater.

1. Cross border environmental policies

As previously reported, more than 70% of the respondents have a written environmental policy in place. 2/3 of those are formulated by HQ. It was especially European and US TNCs that had formulated a policy for their affiliates; only around 40% of the Asian TNCs with environmental policies had their policy formulated by headquarter (Table 10).

2. Cross border environmental standards

HQ frequently sets specific environmental standards for subsidiaries. 36% reported that HQ sets 'specific environmental standards for performance of the affiliate' (see box for examples of areas where standards were set). In general, it was the oldest affiliates and brown field projects that were most inclined to have specific environmental standards set by HQ. It seems that the greater the probability of



accidents, the more likely HQ is to intervene through standard setting.

There were also other interesting variations. For instance, US companies were significantly more inclined to set such standards (62%) than were Asian companies and

European companies (Table 11). Moreover, the fact that more than 50% of the respondents in the chemical sector in general and 70% of the pharmaceutical industry in particular set specific environmental standards for their affiliates, suggests that HQ formulated standards is a practice strongly correlated with industry (Table 12). Interestingly, HQ to Indian affiliates were significantly more inclined to set

environmental standards for subsidiaries (55% versus 28% in Malaysia and 24% in China)¹⁵. This could either reflect that headquarters is particularly concerned with possible repercussions in the case of accidents in this country and therefore devise internal standards for environmental performance, or that headquarters perceive

Areas where HQ sets env. standards for affiliates	
• Accidents	• Noise
• Air emission	• Occupational Health & Safety.
• Compliance with local regulation	• Recycling & production
• Benzene requirement.	• Resource conservation
• Dust	• Safety
• Effluent discharge	• Solid waste disposal
• Emissions	• Spills,
• Energy conservation	• Waste recovery
• Energy consumption	• Waste reduction
• Environmental management	• Waste water

regulatory standards in India to be insufficient and therefore supplement with internal standards.

The ultimate standard set by HQ, is to require affiliates to operate in accordance with home country standards. Thus, the respondents in Malaysia were asked whether 'the parent have an explicit

policy of operating with the same environmental standards regardless of location?' 31% of the Malaysian affiliates reported that the parent have such a policy. However, little information was provided to substantiate, how affiliates interpreted this policy, whether it applied to all areas of environmental concern or only one area, whether it applied to standards for management or standards for performance, etc.

3. Cross border targets for environmental improvements

The respondents were asked, whether HQ sets specific targets for environmental improvements at the affiliate. Such targets are important tools for HQ

Areas where HQ sets targets for environmental improvements at affiliates	
• Annual reduction in effluent volume,	• Noise
• Solid waste reduction	• Phase out of Trillorin by 1999
• Consumption of energy	• Objective of zero discharge
• LCA for a range defined for each product/process	• Objective of zero lost time due to accidents
• The reduction and outphasing of CFCs/ODS.	• Plan to meet the standard of domestic government.
• Cost-saving	• Reduction of energy consumption
• Dust pollution	• Replacement of chemicals.
• EHS improvement target.	• Resource conservation
• Energy conservation	• Safety improvements
• Consumption of organic solvents	• Sterilization of equipment.
• Heavy metal reduction	• Waste reduction
	• Waste water

environmental management function and may be part of local managers' performance evaluation. As was the case with HQ formulated standards, it was found that approx 35% set such targets (see box for areas where the respondents report that HQ sets such targets). And again, it was in particular affiliates in India (Table 13), affiliates with US parents (Table 14) and affiliates operating in

the chemical sector (Table 15) that set such targets.

15. Controls have been made for industry, size in terms of employees and home country.

b. Cross border reporting and controls

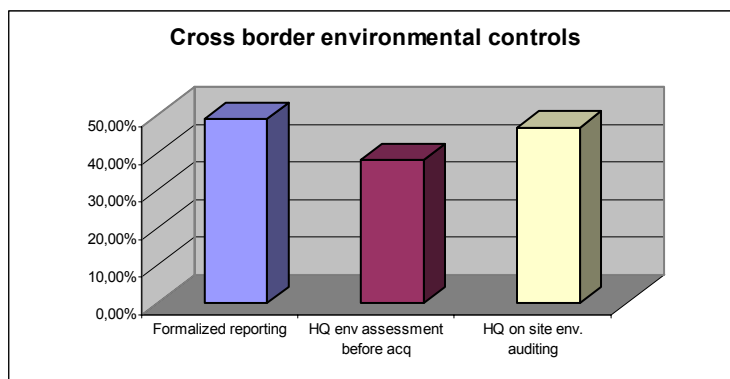
A cross border environmental management system may consist of various procedures for monitoring and controlling whether the environmental conduct of the foreign affiliates is in accordance with the principles, standards and targets outlined by headquarters. These monitoring and control procedures can be pre-acquisition and impact assessments, environmental reporting procedures, or auditing procedures.

1. Pre-acquisition assessments

To conduct pre-acquisition assessments is a way for HQ to get an overview of the potential environmental problems and liabilities of a new investment project. Close to 40% reported to conduct such environmental assessments before acquisition. Not surprisingly, it was mainly projects where the parent had taken over an existing facility that conducted such assessments (Table 16); clearly the concerns for hidden environmental liabilities are greatest in these cases. Especially in China, this practice seemed widespread (Table 17). This finding can be related to the relatively recent establishment of most of the Chinese affiliates.

2. Formalized environmental reporting

App. 45% of the companies had formalized environmental reporting procedures in place, typically, reporting to headquarters annually. However, some of the companies reported more frequently, either on a quarterly or monthly basis. A few companies reported to have online environmental reporting systems that keep HQ constantly updated on environmental dimensions.



The reporting took place through various channels. In some cases, reporting were made in a separate report, while in other cases environmental reporting were made in separate section in the general financial report. Typically, HQ provided a format for the reporting. A few

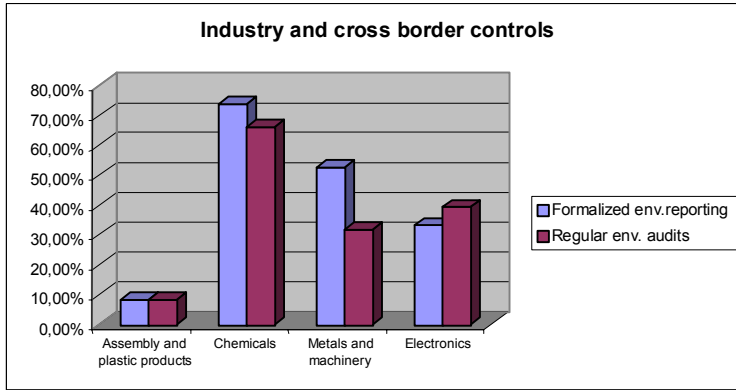
of the respondents had implemented computerized and company-wide accounting and reporting databases. The databases enables headquarters to get an overview of the corporation's total impact on various environmental dimensions, to benchmark different units against each other, and keep track of - on a daily, weekly, monthly or yearly basis - developments on environmental dimensions, thus providing a basis for strategic planning of environmental investment.

The majority of respondents had no formalized reporting system in place. In these cases, it cannot be assumed that HQ has no information on environmental conditions at affiliates; many of the respondents in this group stated that they

reported informally on environmental dimensions, either at board meetings or when HQ conducted quality audits.

3. On site environmental audits by HQ

46% of the respondents reported that HQ conducted regular environmental audits of the affiliate. In regard to frequency, it seemed that such audits typically were conducted every two or three years. Some of the TNCs conducted such audits

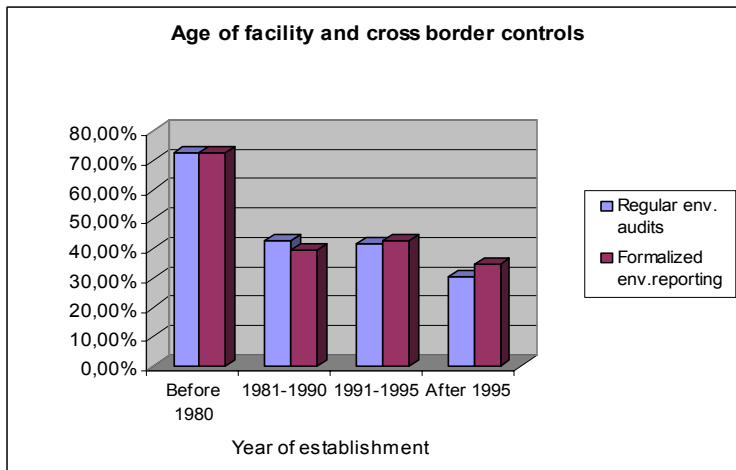


on an annual basis. Among the respondents reporting no regular auditing by HQ, some mentioned that auditing took place on an ad hoc basis whenever a particular problem had developed. The audits were typically conducted either by an auditing team from HQ or by a team from regional

head office. A few respondents reported that the audit was conducted by external consultants.

4. Variations in cross border environmental controls

Evidently, the scope and content of cross border controls are closely related to industry. In the chemical sector, app. 70 % have cross border control procedures, but less than 10% of the affiliates involved in assembly and plastic production. In fact, all 14 pharmaceutical companies had formalized environmental reporting procedures in place and in 12 of them, HQ conducted regular environmental audits. This correlation between industry and cross border control procedures is hardly surprising; the chemical sector contains industries with the greatest



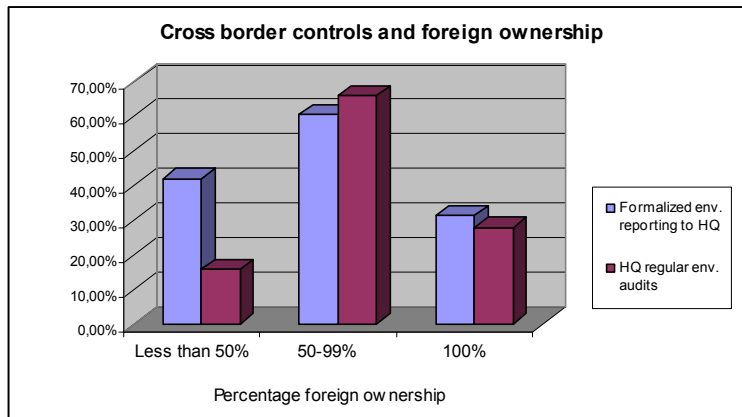
environmental risks and thus the greatest stakes if accidents happen.

Moreover, comprehensive auditing and reporting has long been part of industry practice in the pharmaceutical industry, a practice that in particular is prompted by strict FDA regulation.

A more surprising finding it is that the age of the plant and the scope of cross border environmental controls are strongly correlated; among projects established before 1980, more than 70% have formalized reporting procedures in place, but only around 30% of the projects established after 1995. Concerning HQ regular auditing the numbers are virtually the same. These findings suggest that cross

border environmental controls are mainly established in cases where HQ may have reasons to suspect that serious environmental problems may occur, that is in projects that are of an older date¹⁶.

Finally, there is a strong correlation between the degree of ownership and cross border environmental controls. For instance, app. 70% of the respondents with a majority share report that HQ conducts environmental audits of the affiliate, but



only 17% of those having a minority share and 24% of those having 100% ownership¹⁷. It appears that cross border auditing and reporting is a pivotal way for HQ in a joint venture to get credible information on environmental conditions of the affiliate. Consistent with this finding, all affiliates citing

problems with the joint venture partner as the primary barrier to improved environmental performance, conducted regular environmental audits and had formalized reporting procedures in place as compared to around 45% of all. In other words, audits and reporting is a *must* to ensure reliable information on environmental performance in companies where HQ suspects that there may arise environmental problems.

c. Summary

This evaluation of the scope and content of the environmental management affiliation between HQ and affiliates documented that app. 40-50% of all responding TNCs are setting environmental standards and targets for their affiliates and/or have various cross border environmental control procedures in place. Cross border environmental management is more common, where HQ has a particular need to be fully informed in regard to environmental problems at affiliates, that is in highly polluting industries, in old facilities, and in facilities where the parent has less than 100% ownership.

Although cross border environmental management linkages between HQ and affiliates appear substantial, this does not necessarily imply that these linkages significantly affects the environmental performance of affiliates. In the following section, we will evaluate the role of cross border environmental management vis-a-vis other factors such as local regulation, local management leadership or the nature of the market that the affiliate is operating in.

16. Controls for nature of investment, ownership, industry and size have been made.

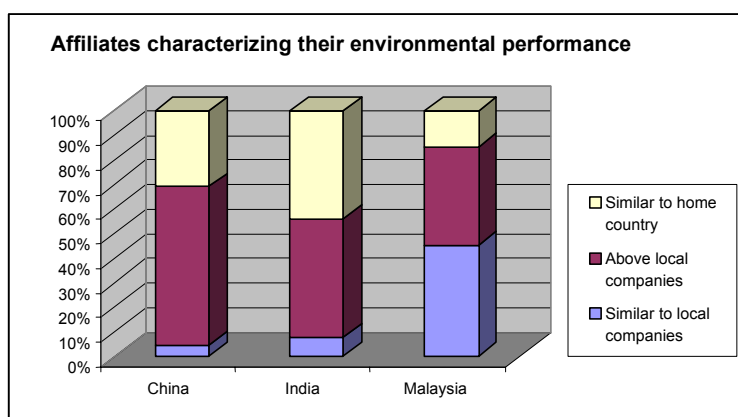
17. Controls have been made for year of establishment, host and home country.

V. The influence of foreign ownership

The fact that significant environmental liaison takes place between HQ and affiliates in the field of the environment does not necessarily imply that HQ is significantly affecting environmental practices of local affiliates. The questionnaire sought to examine the importance of HQ factors vis-a-vis other factors.

a. Environmental performance vis-a-vis non-TNCs

The respondents were asked to characterize their overall environmental performance vis-a-vis local companies by marking one of the following options: a. *Performance equivalent to other comparable companies in the host country*; b. *Performance above average industry standard in host country*; c. *Performance more similar to parent home country standards than to host country standards*. 80% reported that they performed better than comparable local companies and 30% that their performance was equal to that of the home country. Only 20% of the respondents reported that their performance was equal to comparable local companies. This of course, cannot be taken as an indication that the sample companies actually operate beyond local standards, but it indicates that companies do not wish to be depicted as performing at the same levels as local companies.



There were interesting variations between the three host countries; only little more than half the Malaysian affiliates reported to perform better than local companies but more than 90% of the Indian and Chinese affiliates. This difference probably reflects that the Malaysian environmental regulation is

closer to that of the TNC home countries than are those of India and China.

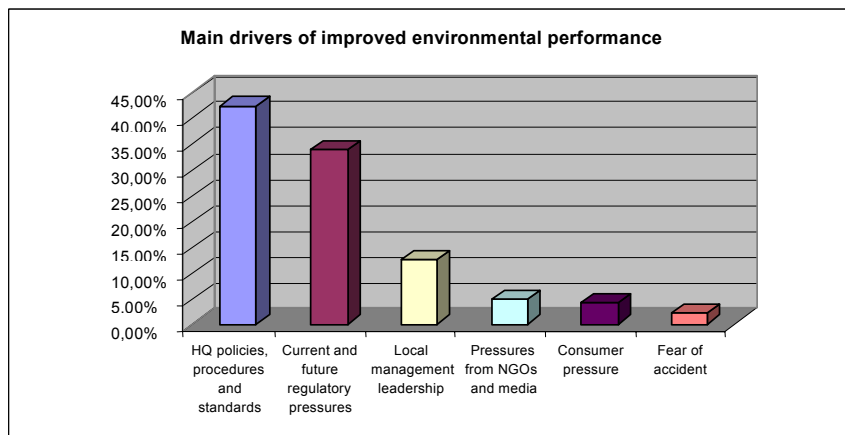
No company in the pharmaceutical industry reported to perform equal to local companies and in general, the chemical sector perceived its environmental performance as not only superior to local standards but as similar to home country standards (Table 18).

UK and Danish companies were significantly more inclined to report that they operate in accordance with home country standards (Table 19), a finding that in the case of Denmark could be related to the fact that there is a strong social expectation that firms bring with them home country standards when they invest abroad¹⁸.

18. Most of the Danish investment projects have the participation of the investment fund IFU, and this fund's policy encourages affiliates to assess whether they meet Danish environmental standards, and explain where there are deviations from Danish standards.

b. Driving forces behind improved environmental performance

The questionnaire sought to unveil the forces behind improved environmental performance at the affiliates. The respondents were asked to prioritize a list of 10 factors that could motivate improved environmental performance. HQ policies and standards ranked first; 40% cited this factor as the primary motivating factor. In other words, in the minds of managers at TNC affiliates, the influence from HQ is even more important than that of e.g. current and anticipated regulatory pressures, consumers, NGOs and media and local management leadership. This finding is



consistent with some of the previously mentioned findings; for instance the fact that 2/3 of the respondents having a written environmental policy in place reported that their environmental policy had been formulated

by headquarters, or the fact that more than 50% cited HQ policies, programmes and procedures as the primary driving force behind actual or considered environmental certification.

It was typically companies with 50-99% ownershare, older facilities and companies in the chemical sector that stated that HQ policies, programmes and procedures was the main motivating factor behind improvements. This is consistent with the above observation, that cross border policies, procedures and practices are significantly more elaborated in companies where there are major environmental risks, either because the plant is old, because there is lack of management control, or because the production technology has high environmental risks.

It should however be stressed that while HQ appears to play a pivotal role in regard to the facilitation of environmental improvements at affiliates, regulatory pressures - current and anticipated – are almost equally important. In fact, in the case of China, current and anticipated government regulation ranked higher than HQ policies and programmes as a motivating factor (50% versus 34% of all), something that could be a reflection of the significant strengthening of Chinese environmental regulation and its enforcement in recent years (Table 20)¹⁹. Looking more closely at the nature of regulatory pressures, current regulation was with 22% more important than anticipated future regulation (11%).

In general, market pressures from consumers appear to be less important; only around 5% stated that this was the primary motivating factor behind environmental

19. Guoming et al, *Cross border environmental management and transnational corporations: The case of China*, Copenhagen: UNCTAD/CBS Occasional Paper Series no 3, 1999.

improvements. This number was similar for both market oriented and production base investment projects. Also NGOs and media pressure seem to play a relatively negligible role (5% cited this as the primary motivating factor), however for the smallest companies (under 150 employees) this factor motivated 12% (Table 21). Also in regard to the smallest companies, current and future government regulation was relatively important compared to HQ policies and standards (Table 21). These observations suggest that small units are relatively more sensitive to pressures of the local regulatory environment than are larger units.

VI. Conclusion

This report presented the preliminary results of an extensive survey of environmental management practices in 154 TNC affiliates in China, Malaysia and India. The survey is unique, both in that it focuses specifically on TNC practices in developing countries and in that it emphasizes cross border aspects of environmental management. Moreover, the sample include responses from a broad variety of sectors and home countries as well as from both very large TNCs, and SME TNCs. However, it should be emphasized that the kind of limitations in regard to generalizations typical for such surveys, also apply to this study. In particular, the conclusions regarding environmental management practice cannot be extrapolated to environmental performance in general. Moreover, the sample is probably to be biased toward companies having more elaborate environmental practices as environmental ‘laggards’ are likely to have declined to participate. Finally, the survey relies solely on affiliate managers’ responses to a questionnaire. In spite of these methodological limitations, the survey provides a first glimpse into the ‘secret world’ of TNC environmental practices in the developing world. It addresses some of the major issues in regard to TNC’s environmental management in developing countries and provides an overview of main trends on this issue.

While environmental management activities were formalized in the vast majority of TNCs in the sample – for instance by designating an environmental manager, by formulating environmental policies, by conducting environmental training activities, etc. - it was only a small proportion of the affiliates that actually had become certified according to an environmental management standard. This is unfortunate, especially because documented corporate self-regulation is particularly important in a context where environmental regulation is in the process of being established and where adequate environmental infrastructures not yet have been established. However, it is positive to note that almost 50% of the responding affiliates are considering to become certified according to an environmental management standard. In a policy perspective, this implies that national governments as well as the international community may have a ‘window’ for encouraging the adoption of environmental management standards among TNC affiliates.

Based on the survey's examination of environmental management practices extending beyond the factory gate, it was the impression that although around 1/3 of the respondents have established environmental procedures related to suppliers and subcontractors, this relation is rather 'shallow'. It is mainly concerned with environmental aspects of product quality and rarely involves a screening of suppliers' and subcontractors' environmental performance, let alone technical assistance. However, with the continued evolution of supplier relations prompted by economic globalization, it is probable (and desirable) that TNC supplier and subcontractor environmental linkages will be increasingly emphasized in the future.

In regard to local communities, the antagonistic relationship between local authorities and TNCs often depicted in media and academic accounts, cannot be corroborated by this survey; generally TNCs are pleased with the collaboration with local environmental authorities. This however, does not imply that the environmental regulatory context of the host country is without significance: First, half the respondents felt that they, being foreign owned, were subject to significantly stricter enforcement than local companies. Second, lack of environmental standards and environmental infrastructures were next to economic constraints, the most important barrier to improved environmental performance among the sample affiliates.

The regulatory void felt by many respondents seems to be compensated for by the establishment of an internal regulatory structure within the TNC network. Thus, the survey established that cross border management in TNCs is not only an emerging discipline but is in fact a well-established practice, especially in regard to high risk activities. The level of cross border integration of environmental management appears relatively high; around 40-50% of the respondents had extensive cross border environmental procedures in place. It thus appears that HQ has a 'hands on' approach to environmental management at affiliates in a large proportion of TNCs. The flip side of the coin is of course that the remaining companies do not have such procedures. This might be a problem if the affiliate have significant environmental risks; however it should be stressed that the bulk of affiliates with few or no cross border environmental practices typically had minor environmental problems.

Whether extensive cross border environmental controls translates into improved environmental performance of affiliates remains an open question. However, it is clear that in the minds of local managers, the HQ connection is pivotal to environmental performance. In this sense, the configurations of environmental management of TNC affiliates differ fundamentally from those of non-TNCs. From a policy perspective, this could be an important observation: If policy makers or NGOs will influence the global conduct of TNCs, it is essential to focus on the headquarter's policies and practices. By lobbying and encouraging HQ, it will be possible to significantly affect environmental practice at developing country affiliates.

An assertion that cannot be validated through this study is that market factors play a central role for TNC environmental management in developing countries. Thus, only a small fraction of the affiliates reported that market factors had

motivated them to environmental improvements. Instead, it appears that 'institutional' factors, such as the local regulatory regime or the corporate governance system, are much more important to affiliate environmental managers. The exception is however the adoption of environmental management standards such as the ISO 14000. Here the survey found a clear correlation between export orientation and inclination to adopt such standards. Moreover, next to headquarter factors, market factors such as pressures from industrial customers and consumers were reported to be the primary motivating factor behind actual or considered certification according to an environmental management standard.

One of the main conclusions of this survey is that foreign ownership do make a difference for environmental management at affiliates in developing countries; in fact headquarters' involvement may be the most important motivating factor behind environmental improvements at affiliates. Various practices through which headquarters influences environmental management at Asian TNC affiliates were identified and their scope and content assessed. However, these findings and conclusions are exclusively based on statistical analysis of responses to a questionnaire and need to be validated and substantiated by more qualitative data from not only local managers at TNC affiliates, but also headquarters' managers and stakeholders such as local regulatory authorities, NGOs and communities. In three subsequent reports from Malaysia, China and India we will take a more detailed look at some of the companies participating in this survey in order to get a more comprehensive understanding of the dynamics of environmental management at TNC affiliates in Asia.

Annex 1: Tables

Table 1: Percentage of all cited investment motives, by host country

Investment motivation	CHINA	INDIA	MALAYSIA
Investment aimed at accessing raw materials	6,02%	1,45%	9,49%
Production base investment ²⁰	51,81%	33,33%	70,80%
Local market access investment	42,17%	65,22%	19,71%
Total	100,00%	100,00%	100,00%

N=150

Table 2: Designated environmental officers by size of affiliate measured in terms of employees

Designated EH&S officer?	Less than 150	150-500	More than 500	Total
n/a	15,56%	0,00%	0,00%	5,11%
No	35,56%	29,79%	17,78%	27,74%
Yes	48,89%	70,21%	82,22%	67,15%
Total	100,00%	100,00%	100,00%	100,00%

N=137

Table 3: Designated environmental officers, by industry

Designated EH&S officer?	Assembly and plastic products	Chemicals	Metals and machinery	Misc.	Electronics	Total
n/a	4,17%	5,08%	10,53%	7,14%	0,00%	5,23%
No	50,00%	8,47%	15,79%	46,43%	30,43%	26,14%
Yes	45,83%	86,44%	73,68%	46,43%	69,57%	68,63%
Total	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

N=153

Table 4: Separate environmental accounts, by host country

Separate env account?	CHINA	INDIA	MALAYSIA	Total
n/a	14,63%	22,64%	11,86%	16,34%
No	51,22%	67,92%	67,80%	63,40%
Yes	34,15%	9,43%	20,34%	20,26%
Total	100,00%	100,00%	100,00%	100,00%

N=153

Table 5: Certification of environmental management system

20. This category consolidates the following options: 'Production for exports', 'savings on labor costs', 'financial incentives', 'political stability' and 'labor flexibility'.

and certification according to a quality standard.

Quality standards certification?	n/a	no	yes	Total
n/a	27,78%	6,14%	13,64%	9,74%
No	5,56%	29,82%	9,09%	24,03%
Yes	66,67%	64,04%	77,27%	66,23%
Total	100,00%	100,00%	100,00%	100,00%

N=154

Table 6: Certification of environmental management system by industry

EMS certification?	Assembly and plastic products	Chemicals	Metals and machinery	Misc.	Electronics	Total
n/a	8,33%	5,08%	15,79%	21,43%	16,67%	11,69%
No	87,50%	84,75%	52,63%	67,86%	58,33%	74,03%
Yes	4,17%	10,17%	31,58%	10,71%	25,00%	14,29%
Total	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

N=154

Table 7: Principal motivating factor behind actual or considered certification, by host country

If, for what reasons did the company invest in certification	CHINA	MALAYSIA	Total
HQ policies and programmes	51,85%	54,29%	53,23%
Consumer image	7,41%	17,14%	12,90%
Pressure from industrial buyers	11,11%	8,57%	9,68%
Government pressure	14,81%	2,86%	8,06%
Prevent accidents	7,41%	2,86%	4,84%
Enhance employee awareness	3,70%	5,71%	4,84%
Investor image	3,70%	2,86%	3,23%
Cost reduction	0,00%	5,71%	3,23%
Total	100,00%	100,00%	100,00%

N=62

Table 8: Principal motivating factor behind actual or considered certification, by investment motive

If, for what reasons did the company invest in certification?	Production base	Market access	Total
HQ policies and programmes	35,29%	59,46%	51,85%
Consumer image	23,53%	10,81%	14,81%
Pressure from industrial buyers	23,53%	5,41%	11,11%
Government pressure	11,76%	8,11%	9,26%
Investor image	5,88%	2,70%	3,70%
Enhance employee awareness	0,00%	5,41%	3,70%
Cost reduction	0,00%	5,41%	3,70%
Prevent accidents	0,00%	2,70%	1,85%
Total	100,00%	100,00%	100,00%

N=55

Table 9: Main barrier to improved environmental performance among Indian affiliates, by ownership share

Barriers to improved env. performance?	Less than 50%	50-60%	60-99%	100%	Total
Economic/ financial constraints	50,00%	47,37%	25,00%	42,86%	42,11%
Lack of effective enforcement	25,00%	15,79%	12,50%	14,29%	15,79%
Lack of environmental infrastructures	25,00%	5,26%	0,00%	0,00%	5,26%
Weak/ non-existent regulations	0,00%	15,79%	12,50%	14,29%	13,16%
Cultural factors	0,00%	0,00%	12,50%	28,57%	7,89%
Lack of qualified staff	0,00%	0,00%	12,50%	0,00%	2,63%
Problems with JV partner	0,00%	15,79%	25,00%	0,00%	13,16%
Total	100,00%	100,00%	100,00%	100,00%	100,00%

N=38

Table 10: Proportion of affiliates with an environmental policy formulated by headquarters, by parent country

If yes, formulated by HQ?	Europe	Asia	US	Total
n/a	4,00%	10,53%	6,67%	5,50%
no	24,00%	47,37%	26,67%	28,44%
yes	72,00%	42,11%	66,67%	66,06%
Total	100,00%	100,00%	100,00%	100,00%

N=109

Table 11: HQ setting environmental standards for affiliate, by parent country

HQ set env standards for affiliate?	Europe	Asia	US	Total
n/a	17,65%	31,25%	6,25%	19,33%
no	45,10%	50,00%	31,25%	44,67%
yes	37,25%	18,75%	62,50%	36,00%
Total	100,00%	100,00%	100,00%	100,00%

N=150

Table 12: HQ setting environmental standards for affiliate, by industry

HQ set env standards for affiliate?	Assembly and plastic products	Pharmaceuticals	Bulk chemicals	Fine chemicals	Paints and dyestuff	Metals and machinery	Miscellaneous	Electronics	Total
n/a	25,00%	7,69%	28,57%	0,00%	7,14%	26,32%	19,23%	21,74%	19,33%
No	66,67%	23,08%	28,57%	60,00%	35,71%	42,11%	38,46%	56,52%	44,67%
Yes	8,33%	69,23%	42,86%	40,00%	57,14%	31,58%	42,31%	21,74%	36,00%
Total	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

N=150

Table 13: HQ sets specific targets for EH&S improvements at affiliate, by host country

HQ set target for improvement?	CHINA	INDIA	MALAYSIA	Total
n/a	45,24%	1,96%	20,69%	21,19%
No	23,81%	50,98%	51,72%	43,71%
Yes	30,95%	47,06%	27,59%	35,10%
Total	100,00%	100,00%	100,00%	100,00%

N=151

Table 14: HQ sets specific targets for EH&S improvements at affiliate, by parent country

HQ set target for improvement?	Europe	Asia	US	Total
n/a	23,08%	25,00%	0,00%	21,19%
no	43,27%	43,75%	46,67%	43,71%
yes	33,65%	31,25%	53,33%	35,10%
Total	100,00%	100,00%	100,00%	100,00%

N= 151

Table 15: HQ sets specific targets for EH&S improvements at affiliate, by industry

HQ set target for improvement?	Assembly and plastic products	Chemicals	Metals and machinery	Miscellaneous	Electronics	Total
n/a	16,67%	22,41%	26,32%	26,92%	12,50%	21,19%
no	66,67%	32,76%	36,84%	38,46%	58,33%	43,71%
yes	16,67%	44,83%	36,84%	34,62%	29,17%	35,10%
Total	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

N= 151

Table 16: Pre-acquisition assessments, by nature of investment

HQ env assessment before acq?	Greenfield investment	Take over of existing facility	Total
n/a	51,92%	23,53%	44,93%
No	16,35%	17,65%	16,67%
Yes	31,73%	58,82%	38,41%
Total	100,00%	100,00%	100,00%

N= 146

Table 17: Pre-acquisition assessments, by host country

HQ env assessment before acq?	CHINA	INDIA	MALAYSIA	Total
n/a	40,54%	48,94%	44,44%	44,93%
No	2,70%	14,89%	27,78%	16,67%
Yes	56,76%	36,17%	27,78%	38,41%
Total	100,00%	100,00%	100,00%	100,00%

N= 152

Table 18: Environmental performance as described by respondents, by industry

Characterize env performance2	Assembly and plastic products	Pharmaceuticals	Chemicals other than pharmaceuticals	Metals and machinery	Miscellaneous	Electronics	Total
Similar to local companies	34,78%	0,00%	16,28%	5,26%	22,22%	38,10%	20,41%
Above local companies	47,83%	57,14%	46,51%	57,89%	48,15%	47,62%	49,66%
Similar to home country	17,39%	42,86%	37,21%	36,84%	29,63%	14,29%	29,93%
Total	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

N= 147

Table 19: Environmental performance as described by respondents, by parent country

Characterize env performance	Rest Europe	UK	Denmark	Asia	US	Total
Similar to local companies	14,52%	13,64%	11,76%	48,28%	11,76%	20,41%
Above local companies	54,84%	40,91%	47,06%	41,38%	58,82%	49,66%
Similar to home country	30,65%	45,45%	41,18%	10,34%	29,41%	29,93%
Total	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%

N=147

Table 20: Main motivating factor behind environmental improvements, by host country

Ranking of motivating factors	China	India	Malaysia	Total
HQ policies, procedures and standards	30,95%	50,00%	44,44%	42,36%
Current regulatory pressures	33,33%	16,67%	20,37%	22,92%
Local management leadership	4,76%	12,50%	18,52%	12,50%
Anticipation of future regulatory pressures	19,05%	6,25%	9,26%	11,11%
Consumer pressure	0,00%	6,25%	5,56%	4,17%
Pressures from NGOs and media	7,14%	6,25%	1,85%	4,86%
Fear of accident	4,76%	2,08%	0,00%	2,08%
Total	100,00%	100,00%	100,00%	100,00%

N=144

Table 21: Main motivating factors behind environmental improvements, by size of affiliate measured in terms of number of employees

Ranking of motivating factors	Less than 150	150-500	More than 500	Total
HQ policies, procedures and standards	30,23%	47,73%	44,19%	40,77%
Current and future regulation	41,86%	29,55%	32,56%	34,62%
Local management leadership	9,30%	11,36%	16,28%	12,31%
Consumer pressure	2,33%	6,82%	4,65%	4,62%
Pressures from NGOs and media	11,63%	2,27%	2,33%	5,38%
Fear of accident	4,65%	2,27%	0,00%	2,31%
Total	100,00%	100,00%	100,00%	100,00%

N=130

Annex 2: Questionnaire

I. GENERAL DESCRIPTION OF FACILITY	Please use right hand field for comments and elaborations
1. Name of company:	----- -----
2. Address:	----- -----
3. Telephone:	----- -----
4. Position of respondent:	----- -----
5. Main activities/production of subsidiary:	----- -----
6. Share of production being exported: _____ %	----- -----
7. Turnover of entire corporation: _____ Turnover of subsidiary: _____	----- -----
8. Number of employees in entire corporation _____ Employees at subsidiary: _____	----- -----
9. Location of corporate headquarters:	----- -----
10. Number of foreign subsidiaries of corporation _____	----- -----
11. Year of establishment/acquisition of facility: _____	----- -----
12. Nature of facility a. Green field investment <input type="radio"/> b. Take over of existing facility <input type="radio"/>	----- ----- -----
13. From your perspective, what motivated the parent company to invest in China? (Please mark at least one) a. Production for domestic market <input type="radio"/> b. Production for exports <input type="radio"/> c. Access to raw materials <input type="radio"/> d. Savings on labor cost <input type="radio"/> e. Labor flexibility <input type="radio"/> f. Political stability <input type="radio"/> g. Financial incentives (tax exemption) <input type="radio"/> h. Good supplier networks <input type="radio"/> i. Administrative efficiency (customs controls, processing of applications, infrastructural support) <input type="radio"/> j. Lack of environmental control/standards <input type="radio"/> k. Other <input type="radio"/>	----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- -----
14. What percentage of ownership is foreign? (Please provide a breakdown of ownership, local/foreign) _____ %	----- -----

II. ENVIRONMENT, HEALTH AND SAFETY (EH&S) MANAGEMENT AT COMPANY			
15. EH&S Organization	Yes	No	N/A
a. Does the subsidiary have a designated EH&S officer?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Does the subsidiary have a safety committee?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Does the subsidiary have an environmental policy?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. If the subsidiary have an environmental policy, is this environmental policy formulated by headquarters?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Would you characterize the environmental performance of the subsidiary as (mark one)			
a. Equivalent to other comparable companies in Malaysia		<input type="radio"/>	
b. Above average industry standard in Malaysia		<input type="radio"/>	
c. More similar to parent home country standards than to Malaysian standards		<input type="radio"/>	
d. Other		<input type="radio"/>	
19. Is the company subscribing to any national or international environmental guidelines?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If yes, please specify guideline			
20.1 Certification			
a. Is the company certified according to a quality standard?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Is the company certified according to an environmental management standard?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If yes, please specify standard			
c. Does the company consider certification according to an environmental standard?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20.2. If environmental certification, for what reasons did the company invest in environmental management certification? (Please rank the most important factors)			
a. Government pressure/incentive		<input type="radio"/>	
b. Headquarters policies, procedures and standards		<input type="radio"/>	
c. Pressure from industrial buyers		<input type="radio"/>	
d. Improved market image among consumers		<input type="radio"/>	
e. Improved image with investors		<input type="radio"/>	
f. Enhance environmental education and awareness among employees		<input type="radio"/>	
g. Improved capacity to prevent accidents/risks		<input type="radio"/>	
h. Cost reduction/productivity improvement		<input type="radio"/>	
i. Other		<input type="radio"/>	
21. Specific EH&S management activities			
a. Does the company have specific EH&S training programmes for employees?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Does the company prepare separate environmental accounts?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Does the company have specific policies and programmes for improving EH&S performance?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

III. ENVIRONMENT, HEALTH AND SAFETY CO-OPERATION WITH THE PARENT COMPANY

22. Did the parent conduct an environmental assessment of the site/ facility before acquisition ?	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
23. Does the parent conduct regular on site environmental auditing of the affiliate? If yes, specify frequency	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
24. Are there formalized environmental reporting procedures between the parent and the affiliate? If yes, specify nature and frequency of these reporting procedures	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
25. Does the parent have an explicit policy of operating with the same environmental standards regardless of location?	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
26. Does headquarters set specific environmental standards for the performance of the affiliate? If yes, specify areas:	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
27. Does headquarters set specific targets for EH&S improvements at affiliate (e.g. targets for waste reduction or energy conservation)? If yes, specify areas:	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

IV. ENVIRONMENTAL RELATIONS TO LOCAL AUTHORITIES, SUPPLIERS AND NGOS

28. How does the company evaluate the relationship to environmental authorities? a. Very good b. Good c. Problematic				----- ----- -----
			<input type="radio"/>	
			<input type="radio"/>	
			<input type="radio"/>	
29. Co-operation with local authorities a. Has the company been in dialogue with local environmental authorities (DOE, state DOE) in the process of designing environmental regulation ? b. Has the company been used as an example by local authorities on how to solve specific environmental problems?	Yes	No	N/A	----- ----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
30. Shared facilities a. Has the company developed any environmental infrastructure which is used by other companies besides itself (common effluent treatment plants, waste management facilities, incinerators, etc.?) b. Has the company collaborated with other firms in setting up common effluent treatment plants? Does the company contract out its waste management activities? Does the company outsource other environmentally sensitive operations and processes?	Yes	No	N/A	----- ----- ----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
31. Does the company co-operate with or support local environmental NGOs? If yes, specify the nature of the co-operation	Yes	No	N/A	----- -----
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

IV. ENVIRONMENTAL RELATIONS TO LOCAL AUTHORITIES, SUPPLIERS AND NGOs (continued)			
32. Co-operation with suppliers and subcontractors			
a. Does the company conduct environmental screening of processes of local subcontractors/ suppliers?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Does the company conduct environmental screening of products of local subcontractors/ suppliers?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Does the company have minimum environmental requirements for suppliers and subcontractors	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. If minimum requirement, is it with respect to			
Products		<input type="radio"/>	
Processes		<input type="radio"/>	
Waste management		<input type="radio"/>	
e. Does the company offer technical assistance for environmental improvements at suppliers and subcontractors?	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
V. FACTORS AFFECTING COMPANY'S ENVIRONMENTAL, HEALTH AND SAFETY PERFORMANCE			
33. Do you feel that your company, having foreign equity, is subject to significantly stricter enforcement of environmental rules than Malaysian companies?			
	Yes	No	N/A
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. Factors that have motivated/ encouraged the company to improved environmental performance ('Please rank the most important factors')			
a. Current regulatory pressures in Malaysia		<input type="radio"/>	
b. The anticipation of future regulation in Malaysia		<input type="radio"/>	
c. Local management leadership		<input type="radio"/>	
d. Headquarters policies, procedures and standards		<input type="radio"/>	
e. Pressure from NGOs and media in Malaysia		<input type="radio"/>	
f. Pressure from NGOs/media in parent home country		<input type="radio"/>	
g. Consumer pressure in Malaysia		<input type="radio"/>	
h. Consumer pressure in OECD markets		<input type="radio"/>	
i. Experiences with accidents		<input type="radio"/>	
j. Rule making of international organizations		<input type="radio"/>	
k. Other		<input type="radio"/>	
31. Major barriers to improved environmental performance at company (Please rank the most important factors')			
a. Economic/ financial constraints		<input type="radio"/>	
b. Weak or non-existent environmental regulations		<input type="radio"/>	
c. Lack of enforcement of environmental rules		<input type="radio"/>	
d. Lack of environmental infrastructures		<input type="radio"/>	
e. Cultural factors in the staff		<input type="radio"/>	
f. Lack of qualified staff		<input type="radio"/>	
g. Relation to joint venture partner		<input type="radio"/>	
h. Other		<input type="radio"/>	

