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VIET NAM

Report

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The preparation of this report was coordinated by the Industrial Sectors and Environment Division. It is based on the work of Mr. Ralph A. Luken, Senior Environmental Adviser, Environment and Energy Branch, Messrs. Paul Hesp, Fred Hubbard and Anders Thuren, international experts, and Bach Tan Sinh and Nguyen Trung Viet, national experts.

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ACRONYMS

ADB	Asian Development Bank
AIT	Asian Institute of Technology
AITCV	Asian Institute of Technology Centre in Vietnam
CESUIA	Centre for Environmental Science in Urban and Industrial Areas
CEFINEA	Training and Research Centre on Water and Environment Technology
CEST	Centre for Environmental Science and Technology
CESUIA	Centre for Environmental Science of Urban and Industrial Areas
CRES	Centre for Natural Resources and Environmental Studies
DOSTE	Department Of Science, Technology and Environment
EEPSA	Economy and Environment Programme for Southeast Asia
EIA	Environmental Impact Assessment
EMD	Environmental Management Division
ENCO	Environmental Committee
EPC	Environmental Protection Centre
EPZ	Export processing zone
HCMC	Ho Chi Minh City
LEP	Law on Environmental Protection
MOSTE	Ministry of Science, Technology and Environment
MPI	Ministry of Planning and Investment
NEA	National Environment Agency
NGO	Non-governmental organization
NRPE	National Research Programme on Environment
PC	People´s Committee
PPC	Provincial People's Committee
R&D	Research and Development
SME	Small and medium-size enterprises
SOSTE	Service of Science, Technology and Environment
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development Organization
VITTEP	Vietnam Institute of Tropical Technology and Environmental Protection
WB	World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY

The central agency responsible for environmental management is the National Environmental Agency (NEA) in the Ministry of Science, Technology and Environment (MOSTE), established in 1994. The main legal basis for such management is the Law on Environmental Protection (LEP), enacted in 1994; some other laws have environmental components as well. Departments of Science, Technology and Environment (DOSTEs) have been established in the line ministries to help them in the task of environmental management in their respective economic sectors. At the provincial level that responsibility lies with the Service of Science, Technology and Environment (SOSTE) of the provincial government. In the main cities, SOSTEs incorporate older environmental agencies.

This report, based on field missions undertaken by UNIDO between March and November 1995, identifies ways in which the government's environmental agencies can make a greater contribution to minimizing the environmental impact of present industrial activities and future industrial development. It identifies on-going activities in the field of environmental management and recommends work programmes that may be supported and/or undertaken by the Government of Viet Nam, primarily the NEA.

Issues and proposals to deal with environmental problems are approached from macro and micro perspectives. The macro approach concerns a broad policy question, the relationship between NEA and the line ministry DOSTEs, the provincial/city SOSTEs and research institutions; the micro approach consists of a series of discussions and recommendations which are met to assist NEA in formulating and implementing an industrial environmental management programme, covering the six key activities of such a programme.

NEA's function should basically be restricted to formulating environmental policies as well as national programmes, in conjunction with the DOSTEs, for achieving the objectives set out by the policies. The programmes should result in the formulation and issuance of regulations and guidelines with the support of DOSTEs. NEA should also be responsible for coordination at the central government level and coordination between the central, provincial and local government levels. Finally, NEA should review and evaluate programmes to ensure that environmental objectives are being achieved and, if necessary, make recommendations for changes in programmes.

SOSTE work should be programme-implementation oriented, involving such activities as issuance of discharge permits, compliance monitoring and enforcement. These activities involve many other local authorities and non-governmental institutions, such as research laboratories. DOSTEs should provide technical advice to the factories owned by their ministries, both in terms of process technology and pollution control, and should assist the factories in securing funds for environmental investments from their ministries.

In the field of ambient quality standards and monitoring, the UNIDO team recommends as high priority actions (a) identifying a limited set of ambient standards (approximately 20) that are most essential for protecting human health and welfare and preparing an implementation schedule (target dates) for achieving them; and (b) completing the national ambient monitoring system now being established through joint efforts with the SOSTEs.

In the field of environmental impact assessment (EIA), the UNIDO team recommends as priority actions (a) revising the existing EIA guidelines to focus only on new industrial activities and to require in-depth technology assessments as part of EIAs for major projects; (b) issuing guidelines for the professional review of EIAs that eliminates the potential for conflicts of interest; and (c) delegating to the extent possible the evaluation of EIAs to SOSTEs.

In the field of regulatory activities, the UNIDO team recommends as high priority actions (a) issuing mass-based discharge standards that distinguish among industrial sub-sectors and between existing and new plants; (b) issuing guidance on how to issue discharge permits that would be multimedia and include waste reduction audits; (c) issuing guidance on how to collect compliance information; and (d) issuing guidance on a systematic and effective approach to enforcement. The team also recommends that NEA adopts complementary measures to the traditional regulatory programme, such as market-based incentives, and supports better planning of industrial areas to minimize the cost of environmental services.

In the field of reporting and public information, the UNIDO team recommends as priority actions (a) expanding its public awareness programme based on on-going projects supported by UNDP and on successful efforts being undertaken by other countries in the region; (b) evaluating the necessity of issuing an annual national environmental report; and (c) devising ways to share technical information among all government agencies involved in industrial environmental management.

In the field of training, the UNIDO team recommends as priority actions (a) starting a "train the trainers" programme for SOSTEs to develop skills in ambient monitoring and analysis, in conducting and reviewing EIAs, in reviewing waste reduction audits, in issuing industrial discharge permits, in compliance monitoring and enforcement; (b) starting a "train the trainers programme for industry personnel to develop skills in waste reduction auditing, in the design, operation and maintenance of pollution control equipment and in understanding environmental requirements; (c) taking advantage of the numerous on-going technical cooperation projects to upgrade the skills of as many environmental professionals as possible.

In the field of international agreements , the UNIDO team recommends that as priority action SOSTEs be involved in informing industrial enterprises about the Montreal Protocol, both its requirements and availability of technical assistance.

1. INTRODUCTION

Viet Nam's economy is at the crucial transitional stage between central planning and market-based business operations. In the industrial sector, both the heritage of the past and the rapid growth of the present offer a challenge to sustainable development. This report discusses the industrial environmental framework, focusing on the national and provincial institutions which have been created to meet this challenge, and presents a number of suggestions for improving environmental management.

Data on pollution in Viet Nam are fragmentary and not always consistent, as there is no system whereby pollution is monitored on a country-wide, continuous basis. However, high industrial growth rates (averaging 8.6 per cent per annum in recent years), ageing capital stock in many factories and lack of attention to environmental issues in the past are resulting in alarming levels of pollution in a number of areas, particularly the major cities and their surroundings: Ho Chi Minh City, Bien Hoa-Dong Nai, Vung Tau in the south and Hanoi, Hai Phong, Lam Thao-Viet Tri, Ha Bac and Ha Long City in the north. The development of the energy sector also has a high potential for environmental damage. A World Bank methodology to predict pollution levels from increases in GDP exemplifies what will happen if no progress towards environmental sustainability is made: assuming a 7 per cent GDP growth rate per year, pollution levels are estimated to increase 4 to 5 times the present levels by the year 2020.

There are about 3,000 industrial enterprises in Viet Nam discharging waste water without treatment. In Viet Tri it is estimated that industry discharges 35 million m^3 of waste water per year with high concentrations of biological oxygen demand (BOD) and chemical oxygen demand (COD) as well as sulphuric acid, chloric acid, sodium hydroxide, benzene and pesticides. Another industrial zone in the north, Thai Nguyen, is estimated to discharge 5 million m^3 of waste water per year. Industries in Dong Nai discharge all effluents into the Dong Nai river without treatment. Effluents mainly consist of raw materials that are lost in this way (up to 40 per cent). Waste water may also contain corroding or toxic chemicals that could damage piping or pumping systems as well as destroy the biological self-cleaning capacity of rivers.

The main industrial air pollutants are total suspended particulates (TSP), carbon monoxide (CO), carbon dioxide (CO_2), sulfur dioxide (SO) and nitrogen oxides (NO). Power generation depends heavily on coal. With urban expansion, industrial areas located on the edge of towns were surrounded by residential areas. Hanoi's Environmental Committee received more than 200 pollution complaints in 1992, of which a majority concerned atmospheric emissions from industrial plants. Air quality standards were violated by 70 per cent of the plants inspected in Hanoi.

The amount of solid waste generated by industry is relatively small since a high percentage of the waste is either reused/recycled or sold to other processors: it accounts, for example, for only 18 per cent of the total amount of solid waste generated in Hanoi and Ho Chi Minh City.

The central agency responsible for environmental management is the National Environmental Agency (NEA) in the Ministry of Science, Technology and Environment (MOSTE), established in 1994. The main legal basis for such management is the Law on Environmental Protection (LEP), enacted in 1994; some other laws have environmental components as well. Departments of Science, Technology and Environment (DOSTEs) have been established in the line ministries to help them in the task of environmental management in their respective economic sectors. At the provincial level that responsibility lies with the Service of Science, Technology and Environment (SOSTE) of the provincial government. In the main cities, SOSTEs incorporate older environmental agencies[1].

A common problem of the institutions is that their capacity - in terms of human resources and equipment - for the enforcement of the existing laws and regulations is limited. Moreover, while the overall legal framework is now fairly comprehensive, detailed regulations are still lacking in a number of areas (a number of effluents, for example, are not yet covered by national standards); this is another obstacle to a coherent application of the law. Environmental programmes also often need to be better focused to be more effective.

This report, based on a mission fielded by UNIDO in March-May 1995, identifies ways in which the government's environmental agencies can make a greater contribution to minimizing the environmental impact of present industrial activities and future industrial development. It identifies ongoing activities in the field of environmental management and recommends work programmes that may be supported and/or undertaken by the Government of Viet Nam, primarily the NEA.

Issues and proposals to deal with environmental problems are approached from macro and micro perspectives. The macro approach concerns a broad policy question, the relations between NEA and the line ministry DOSTEs, the provincial/city SOSTEs and research institutions; the micro approach consists of a series of discussions and recommendations which are met to assist NEA in formulating and implementing an implementing an industrial environmental management programme, covering the seven key activities of such a programme.

The report is structured as follows:

Chapter 2 discusses the existing legal and regulatory framework. In Chapter 3 the roles and responsibilities of the NEA are outlined as well as its relation to the line ministries, the Vietnamese research institutes and the provincial-level agencies or SOSTEs. Chapter 4 summarizes three case studies of agencies at the provincial level that were carried out in the context of this project in Hanoi and Ho Chi Minh City

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[1] The official government designation of the Service of Science, Technology and Environment (SOSTE), which includes the provincial environmental management agency, is also Department of Science, Technology and the Environment (DOSTE). DOSTEs are part of national line ministries as well as part of provincial governments. Within the SOSTEs, the name of the environmental management units varies, in the case of Hanoi it is the Environmental Management Division, in the case of HCMC it is the Environmental Management Committee (ENCO) and in Vinh Phu province, it is the Centre for Environmental Management (CEM). In order to avoid confusion between national and provincial government units in the English language version of this report, the report follows the UNDP/Viet Nam convention that designates provincial DOSTEs as SOSTEs

(HCMC) - which have the administrative status of provinces - and Vinh Phu province. Chapter 5 formulates a series of recommendations which are meant to assist the various government agencies in establishing and implementing an industrial environmental management programme, covering all the key aspects of such a programme. The capabilities for implementing this programme by NEA and the SOSTEs as well as the resources that would be required are described in Chapter 6. Chapter 7, finally, suggests several areas for future technical cooperation. Annexes include a list of environment-related laws and regulations, resources needed by a typical SOSTE and the three case studies about SOSTEs.

2. CURRENT LAWS AND REGULATIONS

2.1 The Law on Environmental Protection

While Viet Nam's 1992 Constitution contains references to environmental issues, a solid legal basis for dealing with such issues was only created in 1994, when the LEP was enacted. The initial impetus for this law was the National Research Programme on the Environment, which submitted a first proposal for the law at a national conference on the environment in 1990. At that time, environmental issues were only dealt with marginally in a few laws, such as the Law on the Protection of People's Health, the Land Law and the Decree on Dike Protection (see Annex 1 for an overview of environment-related laws and regulations - there was virtually no such legislation before 1990, as the Annex shows). Apart from industrial pollution, as briefly described above, Viet Nam's environment is also endangered by the rapid depletion of forest, mineral and marine resources and the irrational use of water resources. The objective of the LEP is to remedy and prevent all such negative impacts of human activities (as well as those caused by natural distasters) and to encourage the effective utilization of the environment for sustainable development in the country. In particular, the LEP is intended to regulate:

- The relationship between socio-economic development and environmental protection;

- Conflicts arising in the course of socio-economic development among economic activities, the quality of life and long-term sustainability;

- Conflicts between overall sustainability and benefits from the use of individual components of the environment;

- Conflicts between individual and social benefits;

- The environmental aspects of global and regional relations.

The LEP is an "umbrella" law; it does not replace earlier laws with an environmental component or overlap with other laws regulating the use of natural resources. Its main features can be summarized as follows:

- The Law regulates the nationwide use of different components of the environment (soil, water, air, ecosystems, etc.), but does not specify the types of economic activity to be regulated.

- The Government determines and controls environmental standards; the Law does not, however, specify standards or Government agencies responsible for them.

- The LEP's pollution control provisions cover (i) prohibition of discharges and imports of machinery not meeting environmental standards (without specifying

limits or standards); (ii) types of pollutants which must be treated before discharge into the environment; (iii) management and treatment of hazardous wastes; (iv) allocation of management responsibilities among central and local Government agencies.

- The Law applies to both Vietnamese and foreign enterprises.

- Environmental impact assessments (EIAs), to be approved by MOSTE, are required for all existing and new business establishments.

- The Law provides for financial compensation in the case of environmental or health damage and plants can be shut down if they do not comply with standards, but in practice firms are rarely fined or encouraged to internalize environmental costs.

- At central government level, MOSTE (with NEA as its executive arm) is charged with the primary responsibility for environmental management, and coordinating the activities of other agencies.

With regard to the latter, a recent UNDP report on environmental aspects of investment[2] in Viet Nam remarks:

> "In assessing the capacities of MOSTE and the NEA in relation to the implementation and enforcement of environmental laws, it should be noted that at present there are few staff employed specifically for this purpose. In particular, there are no lawyers with broad environmental law training..."

This is also true for others involved in ensuring compliance with environmental legislation, such as judges and technical inspectors, both at the central government and the local level.

The LEP provides for two ways in which conflicts about environmental issues can be resolved: through decisions by the administrative organs or through the courts. The former is the more usual way. There is also a reference to a dispute resolution mechanism for environmental conflicts involving two or more provinces, but the LEP does not make clear how conflicts about environmental issues at the ministry level are to be solved.

2.2 Government Decree 175-CP

Government Decree 175-CP (GD 175-CP) was issued in 1994 to provide, as its official title reads, "Guidance for the Implementation of the Law on Environmental Protection". Some of the key areas covered by the articles of this Decree are:

- Emission and noise level standards for motorized transport;

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[2] UNDP - Incorporating environmental considerations into investment decision-making in Viet Nam, Hanoi 1995, p 32

- Identification of areas for which standards are to be developed, including environmental protection in production areas and construction of factories;

- Import/export controls on toxic matters, genetic material, etc.;

- Compliance with international obligations, such as the conventions on climate change, conservation of biodiversity and ozone depletion which were signed by Viet Nam;

- Details of EIA procedures;

- The organization of environmental inspection functions at various central and local government levels, with MOSTE in an overall controlling function;

- Sources of finance for environmental protection;

- Financial incentives to encourage environmentally friendly activities;

- Increasing public awareness of the LEP.

The LEP and the Decree, together with the other laws listed below, provide a fairly extensive legal framework for environmental protection. However, the legal and regulatory framework is not applied in a coherent way:

> "The main difficulty with the present scheme of environmental protection legislation is the lack of knowledge, coordination and consistency in implementing the various provisions..."[3]

This is partly a consequence of the fact, already mentioned, that qualified staff is in short supply (the same is true for monitoring and laboratory equipment). To an extent, the problem can be solved by increasing public participation in pollution monitoring and in the preparation of local environmental protection plans. Such participation has been of crucial importance in the industrialized market economies.

Another problem in implementing the LEP is that many of the standards and regulations for pollution control which the Decree has identified as being required do not exist yet. In 1993, the General Department of Standardization, Metrology and Quality Control in MOSTE was charged with the preparation of new environmental standards for water, air and soil. Mixed working groups with representatives from central and provincial government agencies and scientific institutes did formulate a number of ambient and discharge standards, which were formally adopted in March 1995. But, partly as a consequence of inadequate resources, work on standards is far from complete, which makes it very difficult to enforce environmental legislation.

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[3] UNDP, op cit., p 33.

3. ROLES AND RESPONSIBILITIES: RELATIONSHIPS BETWEEN NEA AND OTHER GOVERNMENT AGENCIES

3.1 General principles

At the central government level, environmental management programmes should be the responsibility of a single environmental agency or of several agencies cooperating on the basis of clearly defined guidelines, or within a coordinated framework of common principles. Any approach has its limitations for effective programme development and management: the sectors affecting environmental quality are numerous and diverse; directives and policies evolve over time to respond to needs not understood when the problems were initially recognized, interpretations of programme managers and decision-makers differ; support for a particular sector or sub-sector may come from well-organized groups with special purposes. These are but a few of the reasons for difficulties in developing a cross-sectoral, focused environmental management programme in a country.

In general, a central government environmental management programme needs to be oriented toward achieving broad objectives that are defined in terms of ambient standards. Basic functional activities at the central government level to achieve these broad objectives include the following:

- Policy formulation to transform legislative mandates into broad directives for achieving objectives. Policies are generally issues at the central government level, followed by programme guidance for provincial and local implementation;

- Programme plans to support specific activities for achieving established objectives. These programme plans should result in issuance of rules, regulations, guidelines (codes of practice) and manuals, and provision of technical and financial assistance, as appropriate, to achieve priority objectives;

- Coordination and cooperation to assure that other organizations with mutual interests, both at central government and provincial level, work together to achieve environmental objectives in the most cost-efficient manner, and that there are consistent environmental regulations for enterprises on a nation-wide basis;

- Programme review and evaluation to ensure that environmental quality objectives are being achieved. Recommendations should be made for changes in plans and programmes if anticipated results are not achieved as specified.

At the central government level, a number of ministries will have mandates with a strong environmental aspect. Health and Economy are obvious examples. In countries like Viet Nam, with a history of central planning, the responsibility for economic development is often still divided among a large number of ministries. In Viet Nam, for example, the various branches of industry are covered by the Ministries of

Industry, Agriculture and Rural Development, Construction and State Corperations. They also own a large number of enterprises. Close cooperation between the central government agency responsible for environmental programmes and the sectoral ministries is essential to ensure consistency of the latter's activities with national environmental objectives and programmes. A separate unit is usually entrusted with environmental affairs in each of the relevant ministries.

The research community plays an important role in identifying sources and assessing the magnitude of environmental problems as well as setting standards, designing equipment, establishing procedures and organizing training courses that will help minimize the environmental impact of economic activities. Institutes which are involved in this type of work should have a degree of autonomy which makes their efforts to safeguard the environment independent from short-term political or economic considerations.

Environmental management at the provincial level should differ considerably from the national level. The activities should be programme-implementation oriented, as they involve such activities as issuance of discharge permits, compliance monitoring and enforcement. The range of activities essential to implementing an integrated programme is so great that no single agency is likely to have the power or capacity to carry out all of them. Thus close cooperation and coordination, as well as clear lines of responsibility, are essential for effective implementation. As there is some overlap in these functions with the central government, directives and agreements need to be established and responsibilities clearly defined for purposes of accountability and evaluation. In Viet Nam, tasks are not always well defined as, for example, Section 3.2 will show. For example, the national environmental authority, NEA, has been given a legal mandate to inspect factories and to apply standards. These tasks should be entrusted to provincial authorities, SOSTEs.

3.2 **The overall institutional framework** (see also Diagram 1)

The National Assembly is the highest representative body of the people of Viet Nam: it enacts laws and has ultimate authority over the government. The Communist Party of Viet Nam provides policy advice to the government, and therefore has a strong impact on policy-making at the ministry level. Proposed laws are drafted by the ministries in conjunction with one of the seven research and advice committees of the National Assembly. In this case, it means that MOSTE works with the Committee for Science, Technology and the Environment.

According to GD 175-CP, the tasks of the environmental arm of MOSTE, NEA, are:

- Prepare and submit to the government for promulgation, or promulgate in accordance with its delegated authority, all legislation related to environmental protection;

- Prepare and submit to the government for approval all the strategies and policies on environmental protection;

- Prepare and submit for government approval, and assist the government in implementing long-term and annual plans to prevent, combat and correct environmental problems; prepare projects on environmental protection and related issues;

- Organize and manage an environmental monitoring system; evaluate environmental situation of the country and submit annual reports to the government and the National Assembly;

- Manage research and application of scientific and technical results in the field of environmental protection; develop and apply a system of environmental standards; organize training courses on environmental management and protection.

- Evaluate EIAs on development projects and establishments; issue or revoke certificates of compliance with environmental standards;

- Provide guidance on LEP to enterprise branches, organizations, administrative units and individuals and ensure compliance with the law; organize environmental inspections; resolve complaints and reports related to environmental protection in accordance with delegated authority;

- Submit to the government proposals for signing or participating in international treaties for environmental protection, and carry out all international activities related to environmental protection.

NEA has four substantive divisions: (i) Monitoring; (ii) Control and Risk Management; (iii) Technology and Environmental Review; (iv) Education and Information. It had 35 staff in 1995, with plans to expand staff to 150. Professional staff are natural scientists and engineers, of which a number have taken short courses in environmental management and environmental impact assessment.

As many environmental problems have an impact outside the activity or area where they originate, the LEP instructs all ministries and government agencies to cooperate with MOSTE. Apart from the various ministries involved in economic issues, the Ministry of Planning and Investment (MPI) should be mentioned as a government body active in areas that are of major concern to MOSTE. Most ministries have established a DOSTE for this purpose; the Provincial People's Committees (PPCs) have also established SOSTEs. The Ministry of Justice and local police forces are obviously involved in the enforcement of environmental legislation, but there is little information on this subject.

The DOSTEs located in the ministries are very small. Their basic role is to provide the ministry in question with advice and information on environmental issues and to provide assistance in drafting environmental regulations within the mandate of the individual ministries. They also take on other tasks, but there is disagreement among various government agencies about these, as the following section will show. Actual decisions on issues with an environmental impact are taken by other ministerial

departments.

The provincial SOSTEs are larger and have greater responsibilities: apart from providing guidance to the provincial authorities, SOSTEs are charged with implementing and monitoring environmental legislation at the provincial level; the basic arbitration mechanism on environmental issues is provided by the PPC, which acts on reports by SOSTE inspectors. There tends to be a shortage of qualified personnel and equipment. SOSTEs are often requested to take on surplus staff from other PPC departments. SOSTEs in the major conurbations incorporate older environmental committees which have set local standards and carried out their own research, and operate independently from NEA in several areas.

Under the National Research Programme on Environment, finally, MOSTE is cooperating with leading universities and research institutes Viet Nam. The relationships between NEA and research institutes, DOSTEs and SOSTEs are discussed in more detail in Sections 3.3 - 3.5.

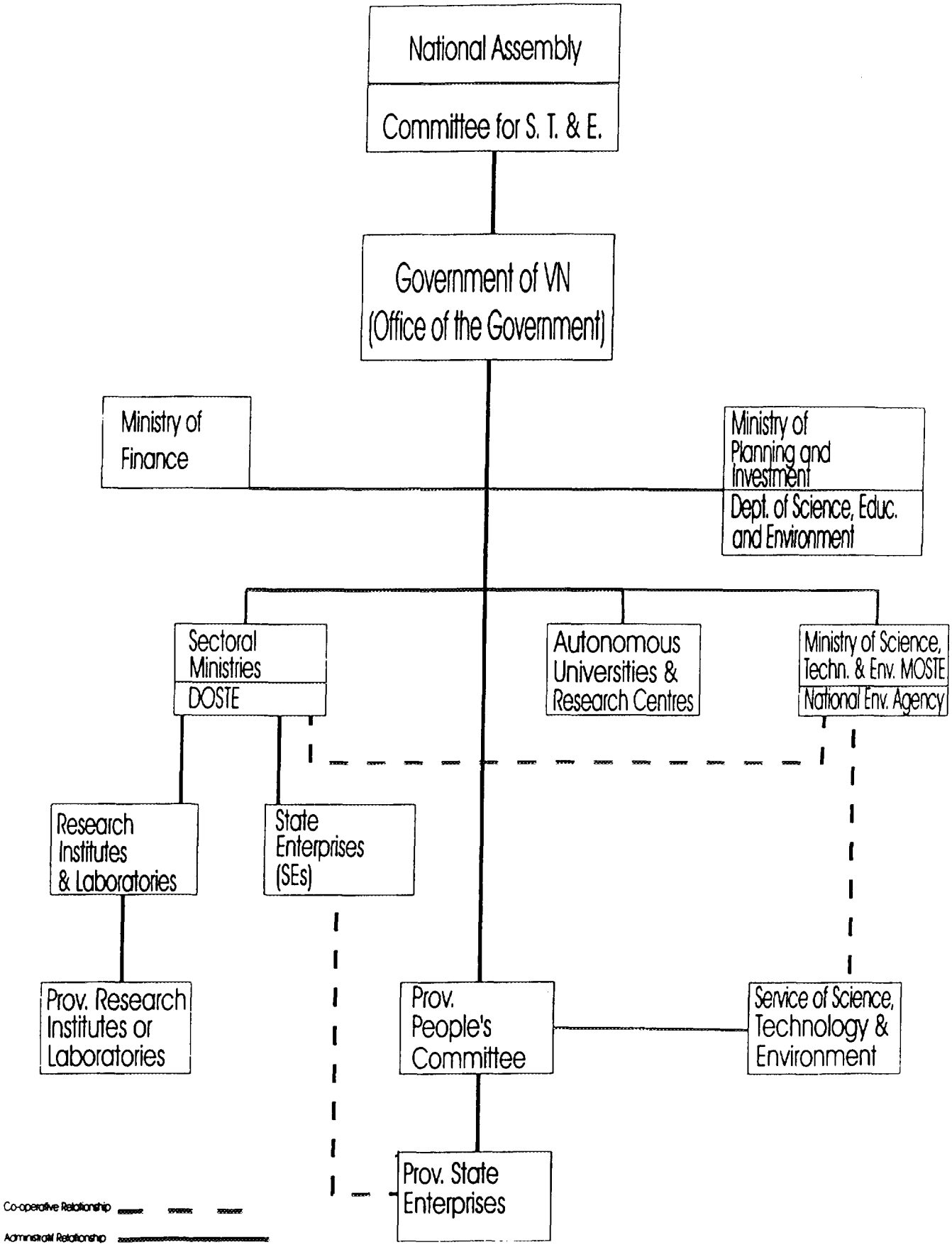
For the execution of its present tasks, NEA does not have adequate resources, human or otherwise. Apart from the fact that the agency should be strengthened, it is also of crucial importance, as the discussion in the following paragraphs will show, that the roles and responsibilities of the many participants who are in one way or another involved in environmental issues are better defined. The institutional set-up should also be regularly reviewed in the light of changing circumstances, for the structure of both the administration and the industrial sector will continue to change as Viet Nam moves further towards a full market economy. This would allow NEA to focus its activities more effectively using its limited resources.

3.3 The relationship between NEA and line ministries

Before MOSTE was established, ministries were individually responsible for the environment in their respective sectors: the Ministry of Agriculture and Rural Development for deforestation problems, the Ministry of Construction for sewage and drainage systems, and so on. MOSTE could not directly take charge of environment-related matters in the productive sector ministries because (a) each has its own mandate and is on the same administrative level; (b) the task would far exceed the capacity of any single ministry, given the diversity of mandates and activities. Hence the DOSTEs under each ministry. MOSTE is consulted in the appointment of senior DOSTE staff.

DOSTEs must also report to MOSTE. This is a potential source of conflict, but a more serious problem is that responsibilities between NEA and DOSTEs have not been separated properly as a result of different interpretations of LEP and GD 175-CP regarding EIA procedures, environmental standards and the funding of environmental activities. The following examples are based on interviews of the UNIDO field mission.

Diagram 1:
Institutional framework for environmental management in Viet Nam



EIA procedures for existing industries

GD 175-CP allows MOSTE to delegate the authority to approve EIAs of existing enterprises to ministries, in certain cases. The guidelines on EIA of existing enterprises issued by MOSTE in November 1994, however, exclude the ministerial DOSTEs from executing such appraisals for enterprises under its management, the task being reserved for MOSTE/NEA (in the case of large projects) and the SOSTEs[4].

The DOSTE in the Ministry of Industry, for example, has assisted that ministry in the following matters:

- Drafting terms of reference for EIA reports;
- Screening institutions on their ability to conduct EIAs;
- Primary review of EIA reports before submission to the ministerial appraisal board for approval;
- Assistance in setting up appraisal boards.

Only 17 out of 300 enterprises under that ministry submitted their EIA reports on time. This was apparently no exception. Without the involvement of the ministry's DOSTE, the process would probably have been even slower and less efficient, and report quality lower.

Environmental standards

In general, MOSTE has been drafting environmental standards without involving ministerial DOSTEs. The latter were only asked to make comments on draft standards. MOSTE has not yet completed the co-ordination and consolidation of documents on standards.

Funding environmental activities

MOSTE has not yet made much progress in coordinating the funding of environmental activities. As a consequence, for example, the Environmental Protection Programme for the chemical industry (which comes under the Ministry of Industry) is not linked to the National Research Programme on Environment supported by MOSTE.

3.4 The relationship between NEA and the research institutes

One of NEA's mandates under GD 175-CP is to manage environmental research and the application of the results, and to organise training courses on

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[4] Internationally, EIAs are only used for new investment projects. It is not clear why MOSTE initiated the campaign for EIAs in factories which were already operating. Possibly, it wanted to know more about the environmental impact of their operations. EIAs, however, are not the right tool for this purpose

environmental management and protection. Such activities are carried out as part of the National Research Programme on Environment (NRPE). NRPE involves leading universities, research centres and institutes from all parts of Viet Nam. At the moment, the Department of Research and Development under MOSTE is actually managing the NRPE for reasons which are not clear. NEA is involved in reviewing the research contents but has no financial control over the programme.

An NRPE steering committee composed of scientists prepares programme proposals and reports to MOSTE; an advisory board of MOSTE (on which NEA is represented), evaluates proposals, approves new programmes and fixes the NRPE budget. Projects are allotted to external institutions after a bidding process. Steering committee members and the institutes they represent are frequently involved in programme implementation.

During the period 1991 to 1995, there were 17 projects in four areas: environmental monitoring, environmental engineering, ecosystem management and socio-economic problems of environmental protection. At present, a National Strategy for Environmental Protection up to the Year 2010 is being prepared by the NEA in co-operation with the NRPE and the National Institute for Science and Technology Forecasting and Strategy Study. Approximately 50 per cent of MOSTE's total budget for environmental research is thought to be earmarked for NRPE.

Institutions can submit their own project proposals for applied research to MOSTE/NEA (or a SOSTE, or an appropriate industrial firm). Approval by MOSTE gives access to low-interest bank loans. Repayments are low for pure research projects; in the case of production-oriented projects, the loan must be fully repaid. Research typically concentrates on pilot projects for waste water treatment systems, air pollution reduction equipment, etc.; R&D projects tend to be full-scale projects (often the second phase of research projects). Manufacturing projects include, for example, pollution control equipment.

Scientific institutions have also been involved in EIAs, on a pilot basis. These institutions are the Centre for Environmental Science of Urban and Industrial Areas (CESUIA) of the Hanoi University of Civil Engineering, the Training and Research Centre on Water and Environmental Technology (CEFINEA) of HCMC Polytechnic University, and the Environmental Protection Centre (EPC) of the Institute for Tropical Technology and Environmental Protection of Viet Nam. Their assessments have been used to identify areas for improving the technology and legislation related to EIA procedures, and have helped NEA to prepare EIA guidelines - these, however, still need further improvement, as Chapter 4 will suggest. The same institutions have also been selected for establishing an environmental monitoring network with the support of NEA. CEFINEA will be responsible for the southern part of Viet Nam, EPC will be responsible for the central part of Viet Nam and CESUIA for the northern part of Viet Nam. They will measure parameters for water, air and soil every third month.

Finally, NEA is drafting a proposal for a National Environmental Research Institute, which would provide advisory services at the highest government levels. It will presumably allow NEA to concentrate fully on its policy-oriented and organizational

work. It is, at the time of drafting this report, not clear what its legal status would be or what its relationship to the existing institutes would be.

The steering committee for the NRPE seems a typical case where roles and responsibilities need clear separation. The members of the steering committee are both the main source of project proposals and in many cases (through the institutes to which they are attached) the implementers of projects. MOSTE/NEA should ensure projects reflect key environmental issues, not personal or institutional interests.

3.5 The relationship between NEA and SOSTEs

In 1994, NEA, together with local and other central authorities, developed the "Environmental Situation in Viet Nam" programme, with the following objectives:

(i) Evaluating the present environmental situation of provinces on the basis of data and information available at research institutions;

(ii) Forecasting environmental changes in relation to the general development of provinces;

(iii) Defining the environmental protection activities needed in response to provincial socio-economic development up to 1995 and 1996-2000; and

(iv) Making recommendations to agencies concerned with environmental protection.

To implement this programme, NEA concluded contracts with all SOSTEs to (i) collect, analyse and evaluate existing data on the environment; (ii) describe the status of the environment; (iii) organise local workshops in order to identify projects and activities needed in the province; (iv) evaluate existing environmental activities and make recommendations for future activities. Each province was given a budget of about 35-45 million VND (US$ 3,500-4,500) for this purpose. By December 1994, 30 provinces had submitted reports to NEA. Some had produced environmental pollution maps highlighting the environmental problems and including suggestions for solving them. It is not clear whether this programme and NRPE are linked (see Section 3.4).

NEA has also organized a series of training courses to improve environmental awareness and environmental management in several provinces. In 1995, it was preparing a new project on institutional strengthening of SOSTEs in environmental management and helping some SOSTEs to set up environmental monitoring systems.

SOSTEs have a dual relationship with MOSTE and with the provincial authorities:

- MOSTE provides part of the budget of SOSTEs (overheads, research, extension and training); additional funding is provided by the provincial authorities, and this may well exceed the funds provided by MOSTE;

- SOSTEs report to MOSTE on technical issues; administratively, however, they come under the PPC, to which SOSTE also refers breaches of environmental laws and regulations for arbitration;

- MOSTE is consulted in the selection of senior SOSTE staff, but staffing decisions lie with the PPC.

Moreover, some of the SOSTEs in large cities have regulations and standards which differ from those formulated by MOSTE/NEA; these were formulated by local environmental committees at a time when national environmental legislation was still virtually non-existent and were retained when the SOSTEs were formed. In spite of the fact that NEA cooperates with the provinces in many areas, there are therefore a number of potential sources of conflict with SOSTEs. In some provinces and municipalities, moreover, SOSTEs operate to a large extent independently from NEA, as the following chapter will show.

4. ENVIRONMENTAL MANAGEMENT AT THE MUNICIPAL/PROVINCIAL LEVEL

The UNIDO mission visited Hanoi, HCMC and the province of Vinh Phu. The former two are municipalities with the same administrative status as provinces. The SOSTE of Vinh Phu is located in the major city of the province, Viet Tri. These three cities may be considered typical for the industrialized regions in Viet Nam. In contrast to the mainly agricultural provinces, local authorities, concerned about increasing industrial pollution, adopted standards and set up environmental agencies well before a national legal and institutional framework was established for that purpose. The standards adopted in Hanoi, HCMC and Vinh Phu are very similar.

This section summarizes the findings of these interviews on the basis of a series of key environmental themes, paying special attention to the relationship with NEA. The relationship between provincial environmental agencies, one of many units within a SOSTE, and line ministries is also briefly described.

4.1 Ambient standards and monitoring

Hanoi

In Hanoi, standards (and regulations) were adopted in 1990 without involvement of the central government. The standards are a mixture: some are based on those used by the Ministry of Health, others on those used by the WHO, East European countries, etc. Hanoi's standards were used as provisional national standards until the adoption of the new national standards in 1995. The number of standards is too large to allow effective monitoring, given the limited resources.

SOSTE is responsible for ambient monitoring, but contracts institutes, such as the Centre for Environmental Science in Urban and Industrial Areas (CESUIA), to do the actual work. In 1994, for example, surface water quality in Hanoi was investigated. SOSTE does not provide guidelines for sampling methods. NEA only has an administrative/funding role; there is no guidance on major parameters, sampling techniques, frequency of sampling, choice of sampling site, appropriate technology, suitable equipment, etc. As in other provinces and cities, it has provided funds for equipment for ambient monitoring or inspections, but SOSTE is still seriously underequipped.

HCMC

In HCMC, standards and regulations were also adopted without assistance from NEA's predecessor. Standards are mainly based on those of neighbouring countries and were prepared with assistance from the Government of Singapore. These are still used. If necessary, they are complemented by the national provisional standards. Although the PPC has given low priority to the development of new standards, SOSTE is at present preparing its own municipal waste water standards - independently from MOSTE. Time-consuming administrative routines prevent SOSTE from reviewing

existing standards; the number of standards is also too large for effective monitoring. The agency was not asked to contribute to the formulation of the provisional national standards, but it was asked for comments on the new standards by MOSTE at a very late stage.

SOSTE is responsible for ambient monitoring but, with the exception of the surveys mentioned below, does not receive assistance, guidance or training from NEA. Funds are provided by the PPC. Sampling is subcontracted to, among others, the EPC, CEFINEA and the Institute for Hygiene and Public Health. No stationary sampling stations are used. Sampling frequency varies between thrice a day to once per month. Data are not calibrated. The Government of Singapore has trained the staff, and the Asian Institute of Technology (AIT) in Bangkok has helped the DOSTE Information Centre to develop a Geographical Information System (GIS). All data are to be incorporated into GIS.

Since 1990, a separate industrial pollution survey has been taking place with NEA support. Data are said to be unreliable; nevertheless, they were used as an input for a HCMC Environmental Master Plan financed by the ADB. A traffic air pollution survey and several other surveys have also taken place. Much work is subcontracted out, and SOSTE has worked on local standardization of pollutant discharge sampling.

Vinh Phu

Again, the local environmental agency has prepared its own standards. These were adopted in 1993 and are based on those of Hanoi, the WHO, the Ministry of Health and several East European countries. The national ambient standards developed by MOSTE are not used in Vinh Phu as they are considered inadequate. The standard for SO_2, for example, is 10 times higher than the level accepted in Vinh Phu. SOSTE has recommended that NEA should review some of the standards, but NEA has responded that this is not their responsibility, but that of the General Department of Standardization, Metrology and Quality Control in MOSTE. As in the other two cities, the number of standards far exceeds monitoring capacity.

MPI is funding environmental surveys, but there is no systematic ambient monitoring programme. SOSTE annually receives money from NEA for building up an analytical environmental laboratory, but no directives or technical assistance, and SOSTE still lacks adequate equipment. SOSTE has carried out detailed environmental surveys in the Phong Chau district, in which some large factories are located. This was financed by the predecessor of MPI, the State Planning Committee. Such work as is done is largely contracted out; the scientific institutions in question receive no guidelines for their work.

4.2 Environmental Impact Assessments

Hanoi

NEA has provided regulations on conducting EIAs in existing enterprises and guidelines for the review of EIAs for foreign investment projects by evaluation boards.

SOSTE, however, also uses its own criteria for EIAs, which are evaluated by its head inspectors as there is no evaluation board.

HCMC

SOSTE has received the NEA guidelines, but are still using the EIA guidelines developed with assistance from the Government of Singapore. There is not enough staff with the proper qualifications for evaluations (again there is no evaluation board; reviews of EIAs are executed by the head inspector).

Vinh Phu

SOSTE has received NEA guidelines concerning EIAs for existing industries and planned investment projects. EIAs are reviewed by an evaluation board consisting of members from various PPC departments, headed by the chairman of SOSTE. No routines have been developed for follow-ups as enterprises expand. Training in EIA evaluation and funds to hire neutral experts to help with EIA evaluations are badly needed. New projects with a significant impact on the national economy submit EIAs directly to NEA; SOSTE is bypassed.

4.3 Regulatory activities

Hanoi

SOSTE has received inspection guidelines from NEA, but NEA has not developed standard procedures for this purpose. The inspectors find the guidelines confusing and follow their own routines. SOSTE regularly conducts enterprise inspections (in the presence of representatives of the relevant district or commune People's Committee, but it has resources for only half the inspections which would be required yearly. There is a serious shortage of qualified staff and a tendency for "unwanted" staff of other PPC departments to be shifted to SOSTE. SOSTE staff reports to NEA representatives on an irregular basis. The information, however, is only presented verbally.

Fines for non-compliance are too low (up to 200,000 VND) to be a deterrent to any but the smallest firms. Although some firms have been closed down, and others have changed their production methods or products, large firms are rarely forced to comply with regulations because of possible negative effects on employment. Some factories have introduced better housekeeping methods, but systematic plans for minimizing their environmental impact have not been adopted and implemented by any of them. No economic instruments are used to increase compliance.

SOSTE attempts to handle difficult cases without turning to NEA assistance. Cases are forwarded to MOSTE/NEA only if arbitration by the PPC does not work. In one case NEA and SOSTE cooperated to solve a complaint about radioactive waste, the latter handling the technical part while NEA took care of the administrative issues.

HCMC

No documents have been received from NEA concerning the implementation of regulations, and NEA does not monitor SOSTE's work in this area or provide special assistance in complicated cases. However, when an oil pollution accident occurred in 1994, NEA assisted SOSTE in finding suitable experts. SOSTE regularly carries out enterprise inspections; the district environmental agencies also provide assistance. The agency is handicapped by a lack equipment and of qualified personnel, which is partly caused by low salaries (this is part of the human resource problem in other cities).

Lack of equipment is probably the reason why factories are only inspected after (written) complaints have been received. Firms may be fined or even closed down if they are found to have broken regulations. Closedowns, however, are temporary - factories often open a week later, and this only happens to small firms. Fines (up to US$ 100) are too low to constitute a deterrent to large firms. Employment fears are an obstacle to effective enforcement of the regulations. There are no economic instruments for encouraging pollutant reduction, although SOSTE has submitted a proposal for charges for water, waste water and solid waste to the PPC.

Vinh Phu

NEA regulations on penalizing breaches of the environmental laws have not been received yet. SOSTE has formulated and is formulating environmental plans, but lacks the resources to fully implement either these or the existing environmental regulations. Apart from periodic, monthly inspections, SOSTE carries out unannounced inspections in the case of complaints. These routines and the inspection forms used have been developed by SOSTE itself.

All industries in the city of Viet Tri exceed discharge standards, especially those for waste water. Several factories have been closed down, are working on pollution control or have shifted to less polluting products. Periodic inspections appear to have made little impact, but factories pay fees for these which would help to finance SOSTE's work. Conflicts over environmental issues are handled by SOSTEs inspectors, for there is no Environmental Inspection Board. Occasionally NEA assists. A team from NEA inspected the Bai Bang Paper Mill after complaints from the local population; in this case, SOSTE was not invited to participate.

4.4 Reporting and information

Hanoi

Once a year, SOSTE is required to report on the environmental situation. The content and structure of the report are determined by NEA. Leading universities and research institutes are contracted to prepare the report, which contains both evaluations and recommendations for next year's activities. Data originate both from SOSTE inspections and from the scientific institutions. The absence of a computerized data storage and retrieval system is a great handicap.

The report on the environmental situation has to be submitted to both the Hanoi PPC and the MPI, with a copy to NEA. The MPI, not NEA, comments on the contents and approves new activities. SOSTE does not issue publications on environmental research as such (neither does NEA), but pays attention to this issue in its monthly Thang Long and has a good relationship with the local media. It often organizes information meetings for representatives of municipal departments and industry managers about new regulations, laws and EIAs.

HCMC

The same procedure is followed as in Hanoi. However, the NEA has not provided guidelines for the reports. SOSTE has a computerized data system and an Internet connection. It has published a black book on the 43 most polluting industries, and a report on the state of the environment in 1994. It does not issue scientific publications on environmental issues.

Vinh Phu

The same procedure is followed as in Hanoi. SOSTE subcontracts the report writing to experts from Hanoi and HCMC. Information on environmental issues is disseminated through occasional articles in SOSTE's own quarterly. SOSTE has arranged public meetings on the environmental situation in Viet Tri on World Environment Day. Computerized data storage and retrieval capacity is inadequate.

4.5 Training

Hanoi

No environmental training has been arranged by SOSTE. However, NEA arranges and finances training programmes for SOSTE staff once or twice a year. This has included training programmes on environmental monitoring and management in Thailand and on environmental economics.

HCMC

In 1994, NEA sent one staff member of SOSTE for a training programme on marine pollution to Sweden. NEA has also organized training on implementing environmental regulations by foreign experts. SOSTE arranges one-day meetings for all district inspectors every month. These meetings report on the environmental situation and provide training/information on, for example, industrial pollution control, inspections and handling complaints. Staff from all districts have been trained in Singapore for one week.

Vinh Phu

SOSTE is very active in arranging training programmes in the province, inviting environmental experts from Hanoi and HCMC to train their staff, industrial managers or other persons in relevant management functions, and resource persons from related

PPC departments. Topics include basic environmental knowledge, environmental engineering, EIA, analytical techniques, industrial waste water management, etc. Training lasts from one to four weeks. In spite of the efforts made so far, SOSTEs staff are not adequately trained yet, and the agency needs additional qualified personnel. Unfortunately, locally available institutes unfortunately mainly offer theoretical training as they lack experience and modern equipment (this explains the reliance on experts from elsewhere in Viet Nam).

4.6 Implementing international treaties

Hanoi

SOSTE has not been informed about international treaties by NEA, such as the Montreal Protocol and the Vienna Convention on the control of ozone-depleting substances, to which Viet Nam became a signatory in 1994.[5] Consequently, it is not involved in implementing these.

HCMC

The situation is identical to that in Hanoi.

Vinh Phu

SOSTE has received all documents of the Rio conference and is informed about the climate change, biodiversity, CFCs etc. NEA has requested SOSTE to survey the CFC situation in the province and to make a plan to minimize the use of CFCs. SOSTE, however, does not have the necessary equipment.

4.7 Cooperation with line ministries

Hanoi

The relevant line ministry is represented during SOSTE inspections of public enterprises. SOSTE also uses the laboratory of that ministry for the analyses. Line ministry DOSTEs assist SOSTE in enforcing regulations and investment in waste treatment facilities in their enterprises. The Police Department is to be involved in the enforcement of new pollution standards for vehicles.

HCMC

SOSTE has no relations with the line ministries even if these have local offices in HCMC. However, it has a good relationship with public sector factories. SOSTE is arranging a training programme on industrial pollution for industrial managers and line ministries' staff.

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[5] The Institute of Meteorology and Hydrology (IMH), rather than NEA, is responsible for implementing the Montreal Protocol in Viet Nam This appears to be another area where roles and responsibilities need to be re-examined

Vinh Phu

SOSTE often cooperates with line ministry DOSTEs in matters related to inspections and EIAs. This functions well, although there is some overlap in responsibilities with the Department of Public Health. Procedures for cooperation and a better demarcation of mandates (also with the police and the Department of Construction) need to be developed on the basis of the LEP. Factories will only follow the directives from the line ministry to which they belong unless pressured by both SOSTE and the ministry in question.

4.8 Conclusions

Most SOSTE activities are programme-implementation oriented, as would be desirable from the theoretical point of view. However, many programmes as well as standards and regulations have often been - and in some cases still are - formulated locally, without reference to a national framework (this also happens in the provinces of Dong Nai, Tay Ninh and Vung Tau). Initially, the rationale was that cities had to tackle environmental problems themselves, in the absence of national legislation. But with a rapidly growing economy, national coordination has become essential. Different local situations may require differentiated standards and regulations, but an incoherent national framework is an incentive for enterprises to concentrate in "pollution havens" and leads to a waste of monitoring and enforcement resources. This is undesirable from an environmental and a developmental point of view.

Cooperation between SOSTEs and NEA seems fragmentary in most areas; lack of cooperation with line ministries has been noted in HCMC. Lack of communication among these agencies is bound to have a negative impact on the effectiveness of environmental laws and regulations. If information on international treaties is not available at the local level, then the likelihood that the country as such will be able to comply with them is minimal.

SOSTE responsibilities sometimes overlap with those of other, local or central government agencies, as in the case of the Department of Public Health in Vinh Phu. Clear guidelines for handling such situations do not seem to exist. Inconsistencies and overlaps are not conducive to good relations with enterprises and potential investors. Coordinated national efforts are also needed to remedy the problem of inadequate local monitoring and enforcement capacity: the establishment of standards and regulations has not been matched by the creation of adequate national and local capacities to monitor/enforce these. The next chapter will suggest ways of enhancing the effectiveness of the work of NEA and the SOSTEs.

5. RECOMMENDATIONS FOR AN ENHANCED INDUSTRIAL ENVIRONMENTAL MANAGEMENT PROGRAMME

Minimizing the environmental impact of industry is, in the end, the responsibility of the enterprises. However, governments have the overall responsibility for a country's environment, and as such they have a key role in discouraging pollution and encouraging cleaner production. The discussion and recommendations which follow are intended to assist the Government of Viet Nam in formulating a package of measures to strengthen key areas of the institutional framework for industrial environmental management.

5.1 Ambient environmental quality standards and monitoring

A comprehensive set of ambient standards is essential if an industrial environmental management programme is to have clear objectives, justifying support for the programme by all segments of society. As standards are achieved, there will be benefits to the country's ecosystems, public health and to enterprises (waste reduction, higher quality of intake water, etc.).

A number of ambient standards measuring air, water and soil quality have been formulated by NEA as well as several provincial/city authorities. Nationwide standards, essential to avoid the creation of pollution havens, are still incomplete. Local standards have been developed without adequately addressing the issue of monitoring and achieving those standards. As a temporary measure, authorities could restrict the number of standards monitored and concentrate available resources on the most dangerous pollutants. At the same time, work on a comprehensive, nationwide system of standards should be speeded up.

The activities for which standards are to be developed have been defined in LEP, and this provides the framework for the actual determination of ambient standards that still need to be set. The first step which has to be taken for ambient water quality standards is to decide which function or combination of functions a resource will have (water, for example., may serve irrigation or fisheries, drinking water supply or other purposes). Issues such as location and type of user should also be taken into account. Then the matching biological, physical and chemical quality criteria can be set (internationally-established standards may be consulted for this purpose).

The creation of a coherent system of standards requires that these are determined at the national level. LEP has charged MOSTE with this task. NEA has prepared a provisional list of standards, but at present evidently lacks the resources to complete the task. There is also the question of incorporating locally developed standards. In some cases, these are justifiably stricter than those set by NEA because they are needed to protect human health or unique ecosystems. Consultations with the SOSTEs in question are therefore needed. Once a coherent system of standards has been agreed upon, the responsibility of SOSTEs would be limited to implementation. NEA would also need to consult industrialists, scientists, PCs and environmental NGOs.

Building on its previous work on standards, the programme would require NEA to take the following steps:

- Evaluating critically what additional ambient quality standards are needed. For these, a formal system of consultation with the SOSTEs and representatives of other relevant agencies, ministries and institutions, the business community and population needs to be established;

- Identifying a limited set of ambient standards (approximately 20) that are most essential for protecting human health and welfare and establishing an implementation schedule (target dates) for achieving them;

- Completing the monitoring system now being established through joint efforts with the SOSTEs;

- Providing full information on the standards to all DOSTEs and SOSTEs, and ensuring that all enterprises and the population in general have access to this information;

- Using monitoring data and other relevant environmental information for periodic reviews of standards.

5.2 Environmental impact assessment

EIAs help to guide the design of projects, with the intention of minimizing their environmental impact. They may refer to a specific enterprise or to a new investment project, but may also be made for the development of a region or sector. In Viet Nam the law prescribes EIAs for all of these. This section, however, basically deals with the first type; EIAs for the other two types are still quite uncommon.

The present EIA format is biased to the provision of information showing that the project complies with standards and regulations at the design stage. Little is said about project execution and operations. EIAs could, however, be developed into an instrument which encourages the incorporation of cost-saving cleaner technologies - at the design stage, during a firm's operations, in future investment decisions.

The basic responsibility for carrying out the EIA should lie with the entrepreneur or investor, who will usually contract an external expert or consultancy firm. The format is provided by NEA. EIAs for public sector enterprises should be passed on to the DOSTEs of the relevant ministries; DOSTEs and SOSTEs should then jointly review the EIAs. Impartiality of evaluation councils must be ensured: experts who have been involved in preparing an EIA should not be on the council.

The reasons for the EIA requirement for existing enterprises should be investigated, and a better alternative should be sought. The effectiveness, in environmental terms, of the simplified assessment used in cases where EIAs are not compulsory should also be investigated.

New investment projects in some cases do not need to submit EIAs. This includes small-scale industries, mechanical assembly operations and most of the consumer goods, office equipment, textiles and wood processing industries (except when chemicals play a significant role in the production process). For such projects, a simplified assessment of environmental impacts and description of planned environmental protection measures is considered adequate. It is estimated that this affects about 50 per cent of the investment projects[6].

Capacity to critique EIAs in NEA and SOSTEs, as well as in other agencies/institutions likely to be represented on the evaluation boards, would have to be strengthened. An expansion of capacity at NEA is foreseen; this is the most urgent need, as the agency is responsible for the largest projects. At the same time, SOSTEs should be assisted in finding a way to deal effectively with the great number of smaller projects (whose combined impact on the environment is likely to be quite serious) and what this means in terms of capacity building. Regional EIAs, as foreseen by the law, might be a solution for areas which are attracting such small projects. These would have to be carried out by a provincial agency.

Scientific institutions and business associations as well as NGOs are building up EIA capacity. It is of great importance to assure the quality of expertise in this area. NEA might explore the possibility of awarding credentials to independent institutes/consultants specializing in EIAs, to ensure impartiality and quality.

The involvement of the population could increase the environmental effectiveness of EIAs: it would increase commitment to the government's environmental policies and citizens can contribute local environmental knowledge. This could take the form of including an NGO representative on evaluation boards.

A programme to improve the EIA system would have the following stages:

- Reviewing the existing NEA guidelines (EIAs only for large projects, technology disclosure provisions in EIAs for large projects, simplified assessments for small projects, elimination of the requirement for EIAs for existing plants), to create a better tool for environmentally sustainable development;

- Distributing revised guidelines to all parties in the EIA process;

- Formulating guidelines for the professional review of draft EIA that exclude those involved in the preparation of EIAs to be members of evaluation boards and requires compensation of members of evaluation boards from a general fund to be supported by project proponents;

- Devising schemes for public participation in the EIA process that would result in a meaningful dialogue with affected parties;

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[6] UNDP 1995, p 43

- Recruiting additional NEA and SOSTE staff with an appropriate background;

- Formulating and implementing a training programme for NEA and SOSTE staff in relevant functions, as well as selected staff from other government agencies involved in EIA evaluations, with the assistance of, for example, ADB and taking advantage of on-going training at national institutions such as Hanoi University and regional institutions such as AIT.

5.3 Regulatory activities

The regulatory function consists of four activities: discharge standards, permits, compliance monitoring and enforcement.

Standards for industrial activities tend to be mostly performance based, i.e. they indicate specific levels of permissible factory emissions/effluents, and to a lesser extent technology based, i.e. referring to a specific technology or method to control pollution. GD 175-CP lists 20 categories of standards with which "organizations and individuals conducting operations...must comply" which have in many cases not been operationalized yet.

The current standards are only concentration based discharge limits, apply to both existing and new plants and are the same for all industrial subsectors. These standards need to be modified in the following ways:

- They should also be mass or weight based limits in order to prevent firms from complying with concentration based limits by diluting their waste streams and to reduce the administrative burden of issuing discharge permits.

- They should differentiate between existing plants, for which phased compliance programmes can be designed (allowing a gradual introduction of pollution abatement equipment as funds become available), and new investment projects, where provisions for cleaner technology should be made at the planning stage. It would be useful to study international experience, in particular that of other countries in the region.

Permits tailor uniform discharge standards to individual facilities and their specific environment. They may deal with a few basic parameters such as acidity of effluents or biological oxygen demand, or they may refer to a specific industrial activity as such, such as the production of polychlorobiphenyls (PCBs). Multi-media permits help to avoid the problems connected with pollution transfers from one medium to another. A waste reduction audit and a schedule for compliance should be part of the procedure.

At present, there are no operating permits, although enterprises are required to guarantee that operations will not affect the environment and that they will adhere to standards. A system of permits would need to be established. This will involve:

- Evaluating the effectiveness of the present system of enterprise guarantees;

- Making waste reduction audits a necessary condition for receiving a discharge permit;

- Designing a multimedia permit system and providing sufficient guidance to SOSTEs on how to negotiate such permits with industrial dischargers;

- Striking a balance between standardization of permits (for easy implementation and enforcement, and to ensure equality before the law) and tailoring permits to specific financial conditions and environmental situations;

- Delineating responsibilities for issuing permits and for enforcement (this would mainly be a task for the SOSTEs, but the Ministry of Justice and local police forces are likely to be involved), and upgrading the requisite skills in the government agency/agencies in question.

Compliance monitoring may take the form of self-monitoring, self-recordkeeping and self-reporting by individual sources, inspections conducted by DOSTE; citizen complaints and monitoring of environmental conditions . It must be backed up by an effective *enforcement* system, which will usually include both "soft" measures (discussions with violators and informal agreements to comply) and "hard" measures (fines, plant closure and even imprisonment). It is evident that this requires an interdisciplinary approach and close cooperation among a number of authorities.

A comprehensive yet transparent regulatory system minimizes the potential for misunderstandings or conflicts among government agencies and with entrepreneurs or future investors with regard to environmental issues. It ensures fair treatment of polluters. For effective compliance monitoring and enforcement the agencies in question need support of politicians and the public opinion, which would require a public information campaign (see Section 5.4).

A programme to improve the present system of compliance monitoring and enforcement would have the following phases:

- Together with the SOSTEs most experienced in compliance monitoring and enforcement, NEA sets up a committee that assesses that experience, identifies the requirements of the programme, determines which action is to be taken on issues such as mandates and resources of individual agencies;

- Submission of committee findings and suggestions for an action programme to MOSTE/NEA;

- NEA designs the organizational framework relating to the relevant agencies, and regulations, etc., together with legal experts and agencies with relevant experience/mandates (SOSTEs, Ministry of Health, ministries involved in economic development, National Planning Committee, Ministry of Justice);

- Approval of the action programme by the government;

- Recruiting and training of NEA/SOSTE staff, taking advantage of the VICEP programme supported by CIDA of Canada where possible, and equipment purchases;

- Implementation, with SOSTEs in a key role.

While Viet Nam needs to build up an effective nationwide compliance monitoring and enforcement system, such a system is costly and likely to be unwieldy: it requires sophisticated equipment, scientific personnel, inspectors and possibly the involvement of police forces; enforcement is time-consuming, especially if offenders must be brought to court. Plant closures which may be necessary from an environmental point of view almost invariably have negative consequences for the local economy and local society.

Better planning of industrial areas, combined with a regional EIA (as foreseen by the law - see Section 5.2), would be one way of facilitating pollution control. A very effective way of reducing effluents is the establishment of industrial estates with phased construction of common waste water treatment and provision of solid waste collection services. A common treatment facility can be very cost effective through economies of scale. There is extensive experience in other Asian countries with estates and treatment facilities established through a combination of public and private funds, for both large- and small-scale industries. However, the spatial distribution of existing industries may in many cases preclude the construction of common facilities and the establishment of such infrastructure requires building community consensus[7].

For all these reasons the government should encourage complementary measures to regulatory control, with the argument that it is often in the self-interest of enterprises to prevent pollution and internalize environmental costs. The introduction of cleaner production methods in individual enterprises should be encouraged by a government information campaign (see Section 5.4) and the introduction of market-based instruments. These are not used in Viet Nam yet; NEA should study the experience of other (preferably developing) countries with these, and SOSTEs should be asked to report on any local initiatives (as in HCMC - see Section 4.3). The Ministry of Finance should also be involved. Market-based instruments include, among others:

- Taxes on emissions and effluents;

- Environmental funds or subsidies on, for example, pollution abatement equipment;

- Fiscal incentives for purchase of such equipment;

- Price differentiation to shift consumer preferences - a tax on leaded petrol can be used to subsidize unleaded petrol;

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[7] NEA and the Ministry of Construction, which has set its own standards, would also need to agree on waste water standards

- Deposits on waste to encourage recycling;

- Tradeable emission permits which "ration" pollution on the basis of an ambient standard set by the government.

Determining the right mix of instruments partly depends on the types of industrial activity and location, and a discussion of these is beyond the scope of this report. The use of instruments, however, is also determined by other factors: the ability to enforce regulations; an awareness of the advantages of cleaner production technologies and the availability of investment funds; and the existence of an efficient public administration system for economic instruments.

5.4 Reporting and public information

Apart from annual reports to the central government, relatively little appears to be done to ensure that information on standards or the state of the environment is made systematically available to decision-makers in central/local government, enterprises and the population in general. Informing all groups is essential: planning, investment and consumption decisions all have impacts on the environment, and the state of the environment affects everybody's well-being. Information is also the starting point for the introduction of environmental improvements in individual enterprises. Citizens, as experience in Viet Nam and many other countries shows, are key agents in the preservation of the environment.

Part of the problem is a lack of resources, including computers for basic data processing. Official reporting would, moreover, require that reporting procedures are standardized throughout the country. Particular attention should be paid to extending the coverage and improving the reliability of data collection and reporting. This would be one of NEA's tasks. The agency would also be responsible for a consolidated report on the state of Viet Nam's environment, the drafting of which could be subcontracted to a specialized scientific institution or consultancy firm. It is questionable whether such a report is needed on an annual basis.

With regard to informing the population and (private) enterprise, an additional problem may be that not all authorities are fully aware yet how important this is. A major environmental awareness project financed by UNDP and executed by MOSTE, however, is underway. An awareness programme focusing specifically on industrial issues should link up with this project. SOSTE-Hanoi sets a good example with regard to public information: its use of the local press and broadcasting system ensures that information is diffused widely at little cost to the agency.

Apart from an increased understanding and acceptance of the government's environmental management programme among the population in general and the business community, the information programme would also lead to a greater number of "bottom up" initiatives to safeguard the environment, both among the local population and in enterprises.

For the population in general, the emphasis would be on the overall state of the environment, the effect of industrial activities on public health (air and water quality, etc.), familiarizing people with the basic concepts of environmentally sustainable industrial development, and creating an awareness of the contribution that individuals and communities can make. The PPC in HCMC has issued a "black book", prepared by the local SOSTE about the worst local polluters, which has generated much publicity. This example could be followed by SOSTEs elsewhere with the modification that this color code approach to regulatory persuasion be expanded to recognize compliance as well as non-compliance with environmental standards, such as is done in Indonesia.

Enterprises would also need to know about the general issues, but would additionally want information on cleaner production techniques and technologies, laws and regulations (including detailed information on standards), incentives and the economic gains of clean production. Special attention should be given to small- and medium-scale enterprises. The recent proposal to initiate a pilot programme in HCMC for cleaner production is an important step in promoting this approach to pollutant reduction. This component should, where possible, link up with the enterprise-level training programmes mentioned in Section 5.5.

While NEA should set out the overall framework of such an information programme, SOSTEs would be heavily involved in its execution, adapting the programme, where necessary, to local circumstances. Scientific institutions, PCs, business associations and the press/radio/TV should also be involved. Programme development and implementation would require NEA to take the following steps:

- Reviewing the experience of the UNDP/MOSTE environmental awareness project;

- Collecting information on such programmes in other countries in the region (UNEP and ADB would be good information sources), and selecting elements which are relevant or can be adapted to the Vietnamese situation;

- Designing the programme, possibly with external public/business information experts;

- Assigning responsibilities to SOSTEs for provincial information activities;

- Identifying institutions and public information media which can help disseminate the information;

- Evaluating, on a yearly basis, the effectiveness of the programme and revising it, if and where necessary.

5.5 Training

While this section focuses on training at the environmental agency and, to an extent, enterprise level, it should be remembered that a generalized basic

understanding of environmental issues is an important precondition for raising environmental know-how and skills in firms and government agencies. That understanding can be created through public information campaigns, as discussed above, and through the educational system. Efforts are being made to incorporate more teaching on environmental matters in the school system[8].

NEA as well as the SOSTEs are short of qualified staff. The available information suggests that the main gaps are in the areas of monitoring, EIA evaluation and enforcement. Although some SOSTEs make great efforts to train factory managers and senior staff from other PPC departments, their own shortcomings in this respect make it unlikely that such training is adequate. Finally, more environmental know-how is needed if the NEA and the SOSTEs are to make greater contributions to the development of future environmental management strategies at the national and provincial level. Training is therefore needed at both levels.

Apart from technical skills to improve their monitoring and enforcement ability, environmental agencies would need information on and training in legal and economic issues; the latter are needed in connection with (i) the formulation of market-based instruments for the industrial environmental management; and (ii) the preparation of new environmental management strategies as economic parameters change.

In enterprises, better environmental know-how at the managerial level has a positive impact on a firm's economic and environmental performance and facilitates communication with government agencies. Training in enterprises will emphasize technical/production management issues; it should include environmental awareness for all staff. Plant managers should additionally acquire skills to conduct waste reduction audits and introduce multi-media pollution prevention concepts. These are issues at the enterprise/DOSTE/NEA interface. They would have to be covered by government training programmes. Special attention should be given to training in the rapidly growing small- and medium-scale sector, where environmental issues are often neglected through lack of understanding and resources.

Environmental management requires an interdisciplinary approach. Training should cut across the borders of academic disciplines and emphasize multi-media (air, soil and water) management for the prevention of pollution spillover.

The following Vietnamese institutions offer training in the field of environmental science/engineering. It should be pointed out that few of them have experience with modern technology or modern environmental management methods.

- Hanoi Polytechnical University, CEST
- Hanoi University of Civil Engineering, CESUIA
- Hanoi University, CRES

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[8] See UNDP 1995, p. 67f. for details

- Asian Institute of Technology Centre in Vietnam (AITCV), Hanoi
- HCMC, EPC
- HCMC Polytechnical University, CEFINEA

There are various institutes in the region which offer environmental training. The Asian Institute of Technology (AIT) in Bangkok, Thailand, arranges through their Continous Education Centre both short-term as well as long-term training programmes in the environmental field. They also arrange master and doctor programmes in the environmental field. In Singapore, the European Union is supporting the Regional Institute for Environmental Technology; the Institute is also arranging training programmes on waste auditing, EIA, etc. The Economy and Environment Programme for Southeast Asia (EEPSEA) in Singapore provides fellowship and research grants to locally based Southeast Asian researchers. Its objective is to enhance local capacity for research on economics of environmental management. The programme provides financial support, meetings, resource persons, access to literature, publications outlets, and opportunities for comparative research across member countries (Thailand, Malaysia, Indonesia, the Philippines, Papua New Guinea, Viet Nam, Cambodia, Laos, China and Sri Lanka). In Hong Kong, the Environmental Protection Department and Hong Kong University would also offer environmental training opportunities.

A number of universities in Australia, Europe and the USA offer degrees in environmental sciences. In Britain, for example, these include the University of Aberdeen and the University of Manchester. Some universities also offer distance learning programmes which may be suitable for Viet Nam.

NEA would be the central agency for the development of training programmes in the public sector. As such it would have to:

- Obtain reports from SOSTEs on their training needs, the training needs of other provincial agencies and - for the relevant issues - of the local industries;
- Estimate training needs (possibly with the assistance of a human resources development specialist) in the context of a national cleaner production programme during the next five years, including training of its own staff;
- Invite proposals from relevant institutions (universities, etc.) for the design and implementation of training courses, and discuss these with the Ministry of Education;
- Execute the programme, which should have a "permanent education" character, and which therefore should be reviewed periodically.

6. CONSTRAINTS, CAPABILITIES AND RESOURCE REQUIREMENTS

Obstacles to the design and execution of a nationwide programme stimulating industrial environmental management have been mentioned at various points in the text of the preceding chapters. Before summarizing the specific problems of the two main agencies - NEA and the SOSTEs - and the actions required to build up their capabilities, it seems useful to briefly outline the general constraints:

- **Definition of programme objectives**: Laws and regulations have been issued with the overall objective of safeguarding the environment, but there are as yet no sharply defined objectives, in terms of a finite set of ambient environmental standards and implementation schedules. These are needed to give the programme clear targets.

- **Allocation of responsibilities**: Many agencies and ministries will be involved in the programme, in one way or another. Environmental management in Viet Nam shows much dissipation of efforts, and there are conflicts where mandates overlap. A decision about the allocation of responsibilities and coordination of efforts should be taken at the highest government level.

- **Human resources**: Lack of staff with appropriate skills/know-how is the most frequently mentioned constraint. Environmental programmes are comparatively recent in Viet Nam, awareness of their importance is limited and funds are very scarce. Efficient training, however, is not only a matter of funding: a sharper definition of the objectives is also needed in order to determine which skills are needed most.

- **Facilities and equipment**: There is a serious shortage of these. Funding is a problem, but resolving this constraint is also dependent on (i) a clear definition of the types of pollution to be monitored and a clear definition of mandates with regard to data processing, information tasks, etc., so that limited funds are used for the appropriate equipment; (ii) the creation of training facilities for operators.

- **Incentives and regulations**: A combination of instruments is needed for successful programme implementation. Regulation and monitoring, while insufficiently developed and inconsistently applied, have received far more attention than incentives. The advantage of the latter, apart from frequent economic gains to enterprises, is that pollution is prevented, reducing the need for controls. The government should therefore give economic instruments full attention.

- **Public information**: Lack of information makes it difficult for the population to support the government's environmental efforts. Information on discharge standards, permits and factory inspections, for example, should be easily accessible to enterprises; it would also allow citizens to do their own "monitoring".

6.1 NEA

NEA is still developing, especially in the field of industrial environmental management. Its staff is experienced in various areas related to natural resources, but lacks experience in the industrial area and cannot carry out the large and growing number of tasks - standard setting, EIA evaluation, public information, training programmes, and so on. This would also require restructuring of NEA.

The total NEA budget for 1995 was approximately US$ 1.2 million, of which US$ 400,000 was earmarked for monitoring equipment for the SOSTEs. There are no figures on the specific budget share for industrial environmental management. Standards, although still incomplete, are very extensive, but the human and technical resources for monitoring are inadequate. The Centre for Management and Control of Air and Water Environment in Viet Nam used to be responsible for national environmental monitoring. The role of this centre and its relationship with CESUIA, EPC and CEFINEA, who have been given monitoring responsibilities by NEA, is not clear.

NEA issues guidelines for EIAs, oil spill clean up, annual environmental reports, environmental standards, environmental monitoring, and environmental inspections. Other areas where guidelines would be needed include cleaner production and market based instruments. The guidelines are distributed to SOSTEs and DOSTEs; apparently this is not done systematically. NEA lacks a system for monitoring how guidelines are followed. It has provided funds to all provinces for reporting on the environmental situation.

Coordination between NEA, the SOSTEs and the DOSTEs in the key economic ministries (the Ministry of Industry, Construction, Agriculture and Rural Development) needs to be improved. Greater involvement of the line ministries could mean that standards would be set at realistic and affordable levels. The line ministries are not included in the EIA process and do not receive any training on EIA evaluations, although its staff has great knowledge of the different industrial branches.

NEA would need additional resources in the following areas:

- **Ambient standards and monitoring**

  Organizationally, NEA would need to be strengthened in order to complete its standards programme. Skill and know-how shortages in this area must be identified and a training programme set up; until NEA staff acquires the required skills, external expertise should be obtained. NEA would also need more resources to assist the SOSTEs in establishing ambient monitoring systems tailored to site specific needs.

- **EIA**

  NEA needs more staff trained in EIA assessments as well as relevant documentation on EIAs, such as World Bank and Asian Development

environmental impact assessment manuals and examples from other countries in the region.

- **Regulatory activities**

  In order to support the work of the other agencies and to be able to provide guidance, NEA staff would need more training in regulatory activities, particularly in the formulation of mass-based discharge standards that differentiate among industry sub-sectors and between existing and new plants and design of a discharge permit programme.

- **Reporting and public information**

  Gathering and disseminating specific information on industry and the environment in Viet Nam would probably require that NEA recruit additional staff, including someone with a background in journalism, to ensure that information is accessible to the general public and that links with the press are intensified.

- **Training**

  With international assistance, the training capacity of Viet Nam's universities and scientific institutions should be improved. Meanwhile, NEA would need to explore opportunities for involving foreign experts and training in other countries. Facilities are available in several other countries in Southeast Asia, as Chapter 5 has shown. When selecting teaching materials or studying the experience of other countries, care should be taken that the information and the teaching methods are relevant to the local Vietnamese context. Training should not only focus on "technical" environmental matters, but also familiarize staff with innovative management techniques such as market based instruments and multimedia discharge permitting.

6.2 The SOSTEs

Provinces and cities have developed a capability to implement environmental regulations, but in different ways, as this report has shown, and the communication with NEA is more efficient in, for example, Hanoi and Vinh Phu than in HCMC. Actual enforcement of standards and regulations is not possible in many cases for socio-economic reasons and because resources are lacking. The capability of SOSTEs to evaluate and approve EIA reports is often very limited. Environmental monitoring is hampered by the lack of automatic sampling/analysis capacity. The availability and reliability of data generated varies strongly. Strong industrial growth and the absence of waste treatment facilities are leading to environmentally hazardous situations.

SOSTE resources would need upgrading in several areas:

- **Organization structure and staff skills**

  Apart from an administrative unit, SOSTEs should have separate EIA evaluation, monitoring and inspection units. Staff in the first should have both economic and environmental skills; in the other two, the emphasis should be on environment-related skills, but the inspectors should also be knowledgeable about laws and economic instruments. A full list of the skills required may be found in Annex 2.

  Training should cover the subjects relevant to each unit. Local universities could help with basic environmental training, and foreign experts could be engaged for a number of topics. Foreign language-speaking staff could also be trained overseas; it should be possible to find donor support for such training.

- **Equipment**

  The agencies will need more equipment for ambient monitoring, both stationary and portable (for factory inspections). The former should monitor air and water, should be located where they are not affected by point sources such as smokestacks, and should have a computer link. A simple laboratory should also be available to each SOSTE, with instrument calibration equipment, preparation of reagents prior to analysis, etc. If properly located, such a laboratory can double as a monitoring station. A list of portable equipment which would typically be needed may be found in Annex 2. For office use, a computer and a printer with appropriate software are required.

7. RECOMMENDATIONS FOR FUTURE TECHNICAL COOPERATION PROJECTS

7.1 Technical Support to NEA

The level of industrial environmental management in the NEA varies significantly among the individual provinces. A few of the provinces, those which are cities such as Hanoi and HCMC, have a strong programme; others are just now recognizing its importance. The NEA faces a challenge and opportunity to stimulate the development of a strong and nationally consistent programme in all provinces and cities.

The objective of this project is to enhance the capacity of NEA to coordinate with and to provide technical assistance to the line ministry DOSTEs and to provincial/city SOSTEs.

Outputs from the project would be guidelines on several functions described in chapter 6, trained personnel in the DOSTEs and SOSTEs who can use the guidelines, reports from international experts on selected technical topics, such as pollution control and source monitoring.

The project would recruit a full-time senior environmental advisor and several short-term consultants in specialized areas. The senior environmental advisor would be responsible for assisting the proposed work groups to issue regulations and guidelines, for advising and training the DOSTEs and SOSTEs on how to implement these regulations and guidelines and for recruitment of short-term international expertise.

7.2 National Ambient Environmental Monitoring System

The setting up of ambient monitoring networks in the Viet Nam, with the exception of HCMC, is still at a preliminary stage or non-existent. At the present time it is logical and expedient to introduce systems for monitoring, sampling and analytical procedures in accordance with recognized international standards.

The objective of this project is to enhance the capacity of SOSTEs to set and operate an accurate and reliable ambient environmental monitoring system.

Outputs from an ambient monitoring system would include (a) an understanding of the environment and where the most cost effective remedial action may be necessary; (b) enhancement of the facilities of those SOSTES dealing with industrial/municipal pollution so that they are capable of dealing with a wide range of often complex monitoring problems; (c) comparative data on environmental conditions in all provinces; (d) exchange and development of expertise over a wide range of disciplines to give a better understanding of the local environment; and (e) a comparison of modelling predictions from EIA's and pollutant discharge audits with real environmental data.

The project would purchase monitoring equipment and consumables and conduct numerous training programmes in the use and maintenance of equipment over a three year period.

7.3 Area-wide environmental quality management (AEQM)

Environmental pollution problems (water, air and soil) are becoming increasingly serious in the two major cities of Viet Nam, Hanoi and HCMC. These problems are resulting from a combination of sources, primarily industry, human settlements and transport.

The objective of this project is to enhance the capacity of regional planning/development institutions and SOSTEs to devise and implement a cost-effective environmental management plan.

Outputs from the project would be (a) an assessment of the assimilative capacity of the ambient air and water quality and the impact of current and future pollutant loadings from all sources on that capacity; (b) a report that formulates, analyzes and evaluates alternative strategies for meeting ambient quality objectives; (c) a realistic implementation schedule that combines the main components of a regulatory programme (mass-based discharge standards, permits, compliance monitoring and enforcement) and complementary measures such as market based incentives; and (d) identified and to some extent implemented pollution prevention measures by the major pollutant sources.

Currently ADB is just completing an environmental master plan for HCMC and UNIDO is just beginning the preparation of AEQM plans for Viet Tri and environs in Vinh Phu Province and for Bein Hua in Dong Nai province. All of these efforts have the potential to stimulate cost-effective improvements in environmental quality in these areas. However, both of these plans in the HCMC region, both the HCMC and the Bein Hua/Dong Nai projects, are limited, understandably so given the available resources, in their geographic and pollutant source assessments. A comprehensive AEQM plan for the HCMC region would cover all human settlement activities that are affecting the water and air quality in the region; this would include HCMC and surrounding provinces. There are currently no comprehensive environmental quality planning efforts underway for Hanoi.

The project would fund a long-term international project management and several short-term international advisers, national experts, training and study tours and purchase of essential equipment.

7.4 National Cleaner Production Centre

The UNIDO team found considerable scope for the use of cleaner production (pollution prevention) techniques and technologies to reduce industrial pollution. This potential, except in a few areas such as solvent recovery, was not being exploited.

The objective of this project is to create a network of institutions and individuals

who can promote and sustain a cleaner production programme.

Outputs from the project would be (a) sectoral and cross-sectoral cleaner production demonstration projects; (b) a small group of trained national experts in the field of cleaner production; (c) a functioning information system on cleaner techniques and technologies; and (d) policy advice based on practical experience in the country on how to integrate cleaner production into all aspects of the industrial development process in the Viet Nam.

The project would fund several short-term international experts, a national expert who would be designated as the cleaner production promoter and discretionary budget for the NCPC to support demonstration and training activities. The NCPC would be twinned with a similar institution in a developed country and would participate in the UNIDO/UNEP international network of NCPCs.

A project document for such a centre to be established at Hanoi Polytechnical University, CEST, is under preparation.

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ANNEX 1: VIET NAM - ENVIRONMENT-RELATED LAWS AND REGULATIONS

I. Law on Environmental Protection (LEP), National Assembly, January 1994

II. Government regulations to implement the LEP

II.1 Decree 175-CP to Implement the LEP, Prime Minister's Office, October 1994

II.2 Regulations on Environmental Impact Assessment

II.1.1 Temporary Guidelines No. 1485/Mtg. of Ministry of Science, Technologyand Environment, on Environmental Impact Assessment of Techno-Economic Projects, 10 September, 1993
II.2.2 Guidelines on Environmental Impact Assessment of Existing Enterprises, MOSTE, No. 1420/Mtg., 26 Nov. 1994
II.2.3 Temporary Decisions on Planning of Environmental Protection Activities, Inter-ministerial document between MOSTE and SPC, No.155/TTLB, 11 April 1994
II.2.4 Decision of Minister of Science, Technology and Environment on Regulation and Organizational Activity of the Evaluation Council for Environmental Impact Assessment and Environmental Licensing, MOSTE, No. 1807/QD-Mtg, 31 December 1994
II.2.5 Guideline to Write and Evaluate Environmental Impact Assessment Reports of Foreign Direct Investment Projects, MOSTE, No. 715/Mtg, 3 April 1995

II.3 Regulations on Inspection and Control

II.3.1 Circular of Guidelines on Organisation, Power and Scope of Activities of Environmental Protection Inspection, MOSTE, No. 1485/Mtg., 12 December 1994
II.3.2 Guidelines on Remedy of Environmental Incidents, MOSTE, No. 1217/Mtg., 27 July 1993
II.3.3 Temporary Guidelines on Rectifying Oil Accidents, MOSTE, No. 389/Mtg., 17 June 1994

II.4 Regulations on Environmental Quality Standards

II.4.1 Different Environmental Quality Standards issued by the Decision of MOSTE No. 229-QD/TDC, 25 March 1995

II.5 Regulations on Environmental Monitoring

II.5.1 Mandate for the environmental monitoring stations and laboratories at Ho Chi Minh Polytechnical Institute and Ha Noi University of Civil Engineering Resolution, MOSTE, No1211/QD/Mtg, 22 Oct 1994
II.5.2 Improvement of monitoring and analytical station for designing environmental monitoring network according to the Decision No. 1220/QD/Mtg, 22 Oct 1994
II.5.3 The tasks of acid rain monitoring station in Lao Cai described in the Decision No. 1355/QD/Mtg, 14 November 1994
II.5.4 The tasks of monitoring and analytical station at the Centre for Environmental Treatment Technology at the Ministry of Defence according to Decision No. 1428/QD/Mtg issued on 28 November, 1994
II.5.5 The tasks of environmental analytical laboratory at the General Department of Standards Quality Control and Metrology according to the Decision No. 1501/QD/Mtg issued on 19 December, 1994

III. Laws and regulations including environment components

III.1 Law on the Protection of People's Health, 1989

III.2 Decree-Law on Taxation upon Natural Resources, State Council, 30 March 1990

III.2.1 Resolution on Detailed Guidelines on the Decree-Law on Taxation On Natural Resources, Council of Ministers, No. 6-HDBT, 7 January 1991

III.3 Decree-law on the Mineral Resources, State Council, 1989

III.3.1 Resolution of the Council of Ministers, No. 95-HDBT on implementation of Decree-Law of Mineral Resources, 25 March 1992
III.3.2 Resolution of Council of Ministers No. 156-HDBT on Organisation, Function and Authority of Specialised Agencies for Mineral Resources. No. 356-HDBT, 26 September 1992
III.3.3 Decision of Ministry of Heavy Industry No. 588-CNNg/QLTN on Issuing Principles and Procedures for Application for Exploitation and Registration of Solid Mineral Mines, 1 Aug. 1992.
III.3.4 Decision of the Ministry of Heavy Industry No. 828- CNNg/QLTN on the Rules of Closing Solid Mineral Mines, 16 Feb. 1992.
III.3.5 Decision on the Rules for Gems Protection and Relating Environment, Heavy Industry, No. 71-QD/QLTN, 24 Feb. 1994
III.3.6 Decision on Issuing the Regulation on Necessary Conditions for Vietnamese and Foreign Economic Organisations, and Individuals to Exploit Gems

III.4 Water Law, in preparation

III.4.1 Decree-law on Dike Protection, State Council, 1989
III.4.2 Resolution of the Minister of Heavy Industry, No.604-CNNg/QLTN, regulating the principles and procedures for extracting underground water and registering projects for extracting underground water - Regulations. 13 Aug. 1992
III.4.3 Regulations No. 605-CNNG/QLTN of the Heavy Industry on the Protection of Underground Water. 13 Aug. 1992
III.4.4 Resolution of the Government No. 85-CP, on Treatment and Administrative Violation in Management and Protection of Water Resources. 22 Nov. 1993
III.4.5 Instruction on Ensuring Clean Water and Hygiene of Rural Environment, No. 200/TTg, Prime Minister, 29 April 1994
III.4.6 Decision of Establishing the Executive Committee on Clean Water and Hygiene for Rural Environment, Prime Minister, No. 516-TTg, 19 September 1994

III.5 Law on Oil and Gas, National Assembly, 19 July 1993

III.5.1 Resolution of the Government, No. 10-CP, on Rules for Safety at Oil and Gas Plants, 19 July 1993

III.6 Decree-Law on Plant Protection and Disease Control, National Assembly, 4 Feb. 1993

III.6.1 Resolution on Implementation of the Decree-Law on Plant Protection and Disease Control, Government, No. 92-CP, 27 Nov. 1993
III.6.2 Circular on Rules for Levy and Management Fees and other Expenses for Biological Protection and Control, Inter-ministry Finance-Agriculture and Food Processing, No. 27-TTLB, 30 March 1994

ANNEX 2: RESOURCES NEEDED BY A TYPICAL SOSTE

(i) Human resources

- Director with administrative experience, capable of functioning as the external spokesman;
- Deputy director with administrative and technical experience, capable of functioning as senior administrator;
- Administration/public information: accountant, secretary/typist with computer skills, documentalist/journalist with appropriate background and computer skills;
- Inspection unit: chemical engineer, environmental engineer;
- EIA unit: biologist with environmental or similar interest, environmental economist, environmental engineer;
- Environmental monitoring unit: maintenance engineer, chemist.

(ii) Equipment (Priority list of portable equipment)

General note: For field investigations (e.g. in factories) it is important to have an analytical laboratory and base for checking and calibrating instruments, reagent preparation prior to analysis, weighing of substrates before and after exposure, etc. If properly sited, the laboratory can be used as a monitoring station.

- Equipment for measuring basic parameters: noise meters, light meter, wind vanes and anemometers, barometer, pitot tubes and sensitive monometers, temperature (electric thermocouple) and mercury in glass, humidity meter;
- Equipment for water analysis: suitable photometer with built-in filters, dilution tubes, etc., range of photometer reagents covering about 30 contaminants;
- pH/temperature/millivolt meter (MV) for redox and ion-selective measurements, dissolved oxygen converter suitable for use with pH/temp/MV;
- Conductivity/total dissolved solids (TDS) meter;
- Turbidity meter;
- BOD and DO analysis units;
- Sample pumps - types include "Personal" and "Fixed" higher flow;
- Collection media: filters (different media), impingers, sample bags, sorbent tubes;
- Passive samplers;
- Electrochemical analyzers - CO_2, NO, HCN, SO_2, Cl, O_2;
- Sensitive balance (5 figures);
- Ion analyzer and electrodes;
- Atomic absorption spectrophotometer;
- Microscope suitable for microbiology;
- Portable data loggers and chart recorders;
- Computer, printer and graphics software.

ANNEX 3a

CASE STUDY OF INDUSTRIAL ENVIRONMENTAL MANAGEMENT IN HANOI

TABLE OF CONTENTS

1 Organizational structure of Hanoi's Service of Science, Technology and Environment, and relations with other organizations

1.1 Organizational structure and responsibilities

SOSTE takes care of all matters in the field of science, technology and environment in Hanoi, e.g. standardization, metrology & quality control, and environmental protection. It has sections for Science and Technology, Standardization, Metrology and Quality Control, and Environmental Management.

SOSTE's Environmental Management Division (EMD) has the following mandates: 1) approval of EIA studies on investment projects in Hanoi (large-scale projects will be handled by MOSTE); 2) formulate and implement environmental legislation and environmental standards; 3) conduct environmental monitoring of the city (permanent-based monitoring stations); 4) conduct periodic and sudden inspections of all operating units in Hanoi; 5) responsible for implementing governmental environmental policy in Hanoi; 6) participate and cooperate with the independent State Inspection Unit in investigating and handling complaints from citizens on industries/individuals violating the regulation; 7) increase the environmental awareness of the society and conduct environmental education; 8) information and training on environmental auditing and reinforcing the cleaner production approach in environmental policy; 9) assist industry on methods of how to reduce pollution (cleaner production and pollution control techniques).

An independent State Inspection Section is being set up following a directive from MOSTE. However, the environmental inspection unit working on periodic and sudden inspections will continue to be subordinate to SOSTE.

The environmental tasks given to SOSTE cannot be executed with the available resources. There is a growing gap between limited existing institutional capacity and the tasks assigned to SOSTE/EMD by the Decree No.175-CP on Protection of the Environment.

1.2 Sharing administrative responsibilities with other local authorities

The People's Committees (PCs) at the district and commune level are often invited to observe and participate during inspections of a factory located in their area. They also receive a copy of the communication between SOSTE and the factory. If the factory violates the regulation, a notice will be sent to the PCs involved to force the factory to comply with the requirements.

The Hanoi Police Authority used to be a member of the Standing Committee and always participated during the meetings and the decisions that were taken. It has never

been necessary to ask the police for assistance when inspecting the factory, closing down of the workshops or getting payment for the inspection costs. The traffic police will play an active role when the Regulation on Road Traffic Pollution Control comes into force. The Department of Finance under the Hanoi PC is responsible for the overall budget of SOSTE.

1.3 Relations with institutes, universities and other organizations

Before 1994, there was a Standing Committee where members consisted of Directors or Vice-Directors from various agencies. Since members of the Standing Committee were representatives from various agencies, institutes and universities that are involved in environmental management in Hanoi, such as the Department of Construction (in charge of urbanisation issues), there were regular contacts with other institutions through advisory meetings. In addition, the Chairman of the Hanoi Environmental Committee was at the same time Vice-chairman of Hanoi's People Committee. Therefore, all decisions and information handled by the Standing Committee were effectively transferred and implemented with a minimum of administrative procedures.

2 Ambient standards and monitoring

Environmental standards were issued by Hanoi People's Committee in 1990 at the same time as the environmental regulations were undertaken. The standards were extracted from World Health Organization (WHO), the Ministry of Health and countries in Eastern Europe. Standards for ambient air cover 95 pollutants, and 177 pollutants for water and noise. Work-place standards include 140 air pollutants, 15 particulate (including coal and cement dust) and noise parameters. The ambient standards, which set air and water quality goals and are the foundation of regulation, do not include basic parameters for evaluating water quality such as BOD and COD and key human health parameters e.g. TSP, SO_2, lead and mercury.

SOSTE is responsible for setting up an environmental monitoring network in Hanoi and for producing pollution maps. At present, there is no organized monitoring and monitoring data are fragmentary. There are pollution maps for Hanoi developed by Hanoi's CESUIA, but the maps are based on data generated during the last five years. There are no stationary environmental monitoring stations in operation in Hanoi and consequently the data have been generated with mobile equipment of varying quality. The reliability and use of the pollution maps are therefore limited and there is a clear need for collecting basic data on the environmental situation in Hanoi.

Capacity to measure and control all the standards is very limited. SOSTE might streamline the ambient environmental standards and ensure that the standards cover no more than 20 parameters including key parameters protecting human health and welfare.

3 Environmental impact assessments

The Hanoi City Regulation on Urban Environment Protection, issued by the Hanoi People's Committee in 1990, is considered the first local environmental regulation in Vietnam. On this basis, Hanoi introduced its own EIA regulations and procedures. Hanoi's experience was of great value to MOSTE when it formulated nationwide EIA procedures. SOSTE, on behalf of the People's Committee, screens, reviews and comments on environmental aspects of investment projects applied in Hanoi before these projects can be approved by the responsible agencies, such as MPI. Of the 15 projects that required an EIA, SOSTE has appraised seven reports, the others are being submitted for approval.

The Temporary Guidance on EIA of Socio-economic Plans and Development Projects of Hanoi states that "the proponent who proposes or manages or invests the project shall be responsible for preparing an EIA report. If the proponent does not have the capacity to prepare the EIA, he can ask other institutions specialised in this field to prepare it, but the proponent must sign and seal that report". But as the definition of EIA has never been clear, there are different interpretations and inconsistencies, and EIAs are not properly integrated into the decision-making process.

Once the EIA report is completed, SOSTE has to respond to the proponent within a duration of 20 - 60 days depending on whether it is an Initial Environmental Examination (IIE) or EIA and on the scope of the proposed project. With the existing institutional capacity at the SOSTE, it is impossible to fulfil this requirement. So far, approval of EIA reports is a matter of personal decision at SOSTE. There is no evaluation council with knowledgeable experts.

In spite of SOSTE's efforts with regard to EIAs, their impact is still limited. SOSTE has neither been involved in the preparation and approval of the Hanoi Master Plan up to the year 2000 nor in the planning of different industrial areas, science and technology parks, although there are clear legal arguments for an EIA in these cases.

Public participation in the EIA procedure, from preparation to discussion and approval, is very limited or not provided for. It is not mentioned in any environmental regulation. At present, many international organizations, such as World Bank, do not approve a project lacking public participation in the EIA process.

4 Regulatory activities

4.1 Licensing

An environmental agreement is signed between SOSTE and the individual enterprise before a production license is given. This is required for all enterprises, also for those which do not require an EIA. As a first step, the enterprise should submit an Environmental Confirming Declaration and a Commitment on Environment to SOSTE. After that, SOSTE will

send its Inspection Board to visit the enterprise and to check the Confirming Declaration. Once it is approved by the head of the Inspection Board, SOSTE issues the agreement. An environmental agreement has been concluded with approximately 1,080 enterprises.

4.2 Compliance monitoring and enforcement

Periodic inspections

Periodic inspections should be conducted at each operating unit at least one time per year. Plants producing fertilizers, toxics, batteries, and other electrical products, active chemicals and pesticides are to be inspected twice a year. The number that should be conducted annually is about 250, but lack of resources limits the number. When the inspector visits the factory, at a pre-announced date, the factory is required to submit business papers, data on production and raw material use, handling of waste, waste water treatment facilities and other pollution control equipment, etc. SOSTE will then contact one of their contracted laboratories and submit a list of requested analytical parameters for sampling and analysis. The results will be reported to the Inspection Board. SOSTE will then send the final report to the factory not later than 15 days from the inspection date.

Inspection fees are paid by inspected factories directly to SOSTE. Of the fees, 70 per cent are paid back to the contracting laboratories and 30 per cent to SOSTE as administrative expenses.The factory must pay inspection fees not later than seven days after receiving the inspection results.

Since 1992, about 200 plants have been inspected. In 70 per cent of these cases, emissions exceeded air quality standards, even though production levels are low at present. During the last seven years, SOSTE has handled 125 cases involving a violation of the regulations.The penalty may consist of a warning or a fine of 50,000 to 200,000 VND. None of the many factories violating the regulations has been fined so far, but 13 plants were permanently closed, 29 were forced to solve their pollution problems within a limited period, 8 were forced to change products and 75 enterprises were requested to prepare a plan and a time schedule on investment for waste treatment facilities. None of the industries has actually developed a programme for pollution control. Most of the plants can only make small improvements in, for example, good housekeeping (and SOSTE generally does not press them). Many factories are waiting for foreign joint venture partners to invest in and upgrade their technology.

A few attempts have been made to relocate or limit heavily polluting industries in Hanoi. The Leather Tannery Workshop at Thuy Khue has been moved out of the residential area due to air problems. The Army Workshop, which is located in Gia Lam district, had to stop because of toxic gases discharged from the factory without any treatment. However, local authorities dealing with high levels of unemployment are reluctant to take action against such factories.

There are no economic incentives for reducing pollution yet. Emissions are not taxed. Taxation for investments is the same for waste treatment facilities as for other buildings and production equipment. This means that the investor has to pay taxes if it wants to reduce pollution, by installing a scrubber, cyclone or waste water treatment plant.

Sudden inspections

Sudden inspections take place when complaints are received from offices or people in the surrounding area on the pollution situation of a certain factory. The complaint must be delivered by either a written letter or a personal visit to SOSTE. Complaints delivered by telephone are not accepted. The complaint is examined, and the person who lodged the complaint receives an answer within 30 days. If that person would still like SOSTE to make a sudden inspection, he or she will be charged in advance for the inspection cost. It will then still take some time to get approval for an inspection and to invite the contracting laboratories to conduct the inspection. Therefore the inspector may find a different situation. If inspection proves that the factory violates the regulations, the control fee will be paid back to the person who lodged the complaint, but if the inspection proves that the factory does not violate the regulations, the fee paid by the person will not be returned.

Up to 1995, SOSTE received a total of 268 complaints about environmental pollution. Of these, 5 cases were dealt with; 38 cases were transferred to other concerned agencies for investigation. According to SOSTE, 30 per cent of the complaints are true, 20 per cent are misunderstandings and the rest are based on personal grievances.

Parameters included in the inspection protocol

The basic parameters that are measured at all sampling points are: temperature, humidity, wind speed, illumination, dust and noise level. Other parameters that are measured depend on factory activities. Examples of air quality parameters are CO_2, CO, NO_x, SO_2 and water quality parameters like pH, NH_4, NO_3, CO_3, BOD, COD, etc. Standards are concentration-based rather than mass-based.

Contracting laboratories and calibration control

Since SOSTE does not have facilities for conducting physical and chemical analysis, it has to rely on contracting laboratories at a number of research centres. Before LEP was issued, most of the laboratories have been working with analysing parameters related to occupational health and safety. They have limited experience in analysing waste water and polluted air and the only laboratory that has some kind of experience in this field is the Laboratory of Design Company for Water Supply and Sanitation System under the Ministry of Construction.

SOSTE's responsibilities include industries that belong to all the different ministries. However, samples taken from industries belonging to the Ministry of Industry are analysed

by that Ministry's laboratory. The same situation exists for all other industries. This means that the Ministries control and check themselves; this discourages objective testing.

There are no directives from SOSTE to the contracted laboratories on quality control for the collection of samples, sample sites, chemical analysis, evaluation of results. The contracting laboratories decide themselves where and how to take and store samples, and which analytical procedures are required. As a consequence, data generated by one laboratory cannot be compared with data from another, and neither can the pollution data of different years.

Equipment for inspections, monitoring and data storage

SOSTE does not have enough equipment for inspections. There is one instrument for analysing water parameters, received from a Swedish donor agency in 1993. The equipment is portable and could be used for measuring the following water parameters: pH, DO, conductivity, temperature, NO_3, NO_2, SO_4, PO_4, total chloride, copper, chromium, total iron and manganese. However, there are difficulties in maintaining the instrument (spare parts, consumables, service, application support).

All documents are stored as paper copies including all documents related to inspections. No register or index has been developed. The computer capacity is limited to one standard computer not suitable for data storage.

5 Reporting and public information

Every month SOSTE produces and distributes the Thang Long magazine. The magazine discusses science, technology and environmental protection. The target groups are scientists, researchers and decision-makers. The magazine is distributed to all leading institutes and universities throughout the country with distribution of around 10,000 issues per month.

SOSTE has a close relationship with mass media (newspapers, TV) that often contact them when they plan to write about environment. Vietnam TV has every week one section for environmental issues and SOSTE often provides advisors or resource persons. Every year on World Environment Day, SOSTE actively encourages the public to be environmentally active: industry workers are urged to clean their factory and plant trees, children urged to clean their school etc.

6 Human resources issues

In mid-1995, there were about 100 persons working at SOSTE, of which 15 are in EMD. Five persons have a degree in economics or engineering. The number and skills of the staff of EMD are to be strengthened. This could include an exchange of the present staff for staff with a more relevant education and background. The number of permanent employed

staff is to be increased from 9 to 20.

Two persons have received long-term training experience from abroad (France and Holland) in the field of Urban Management and Environmental Science & Technology. Three persons have received short-term overseas training on environmental monitoring (Bangkok), solid waste management (Sweden), hazardous waste management (Singapore), pollution control (Singapore) and biogas (China). Three persons have been trained in the country on EIA, industrial pollution control and bio-fertilizers. Five of the total staff have received training on environment protection issues. There are three persons that have a proficiency in English and one person in French.

The level of environmental know-how is highly variable, in spite of these training efforts. More training is needed in evaluation of EIAs, calibration and sample analysis, environmental regulations, pollution prevention and documentation/data storage. Training of SOSTE staff will also be needed before the agency will be capable of helping people working on environmental issues at the district and commune level to acquire an understanding of environmental issues and regulations.

ANNEX 3b

CASE STUDY OF INDUSTRIAL ENVIRONMENTAL MANAGEMENT IN HO CHI MINH CITY

Table of contents

1 Organizational structure of the HCMC Service of Science, Technology and Environment, and relations with other organizations

1.1 Organizational structure and responsibilities

In 1995, SOSTE had seven divisions, one of which was involved in environmental management. SOSTE receives its annual budget from the People's Committee. The responsibilities given to SOSTE's environmental division, the Environmental Committee (ENCO), include inspection, EIA evaluation, programme planning, environmental monitoring, international relations, environmental training and environmental studies.

HCMC is the only city in Viet Nam with environmental units in all its districts. According to a decree of the HCMC PC, the organizational structure of these District Environmental Authorities (DEAs) should be identical with SOSTE, but the DEAs lack funds and experienced staff to comply with the decree. SOSTE always assists the districts when environmental accidents occur.

The DEA has the following responsibilities: 1/ to prepare short and long-term environmental management programmes; 2/ to develop guidelines on environmental legislation and regulations in their district; 3/ to organize and develop environmental projects and programmes; 4/ to educate and inform about environmental issues.

In recent years, SOSTE has established a laboratory equipped and financed by the city that is used when conducting environmental inspections. Additional equipment has been purchased with ADB funds. Analytical capacity, however, would need to be expanded further.

1.2 Sharing administrative responsibilities with other local authorities

In HCMC, four organizations have a significant impact on SOSTE: 1) the Communist Party, which determines the number of staff of SOSTE, the annual budget and the direction of their activities; 2) the HCMC People's Committee, which establishes programmes that SOSTE must follow; 3) the City Planning Committee, which approves plans, programmes, projects and budgets prepared by SOSTE; 4) the City Financial Department, which monitors and controls all expenses of SOSTE.

SOSTE also participates in the meeting with these organizations in matters related to master plans for the city development, location of industrial estates and environmental management strategies.

SOSTE occasionally shares the administrative responsibility with other local or central authorities such as oil spill accidents (NEA, Institute of Ecology, HCMC People's Committee, etc.), solid waste management (the Youth Association, the Women Association,

Public Health Department, etc.), traffic air pollution control (police department, CEFINEA, Institute of Labour Protection).

1.3 Relations with institutes, universities and other organizations

SOSTE has established a close relationships 90 research centres, 24 universities, 26 colleges and 27 scientific associations in HCMC and acts as a co-ordinator when implementing the research projects.

2 Ambient standards and monitoring

Currently, there is one set of Regulations on Environmental Pollution Control in HCMC established by SOSTE covering air pollution, noise, industrial and domestic wastewater. These standards are mainly based on those of neighbouring countries and were prepared with assistance from the Government of Singapore. In addition, the city uses national standards for pollution control and drinking water standards established by MOH and MOSTE. The available information did not allow a clear distinction between ambient and discharge standards.

The environmental monitoring network was established in October 1992. There are ten sampling points from the river system with monthly sampling (Ben Than, Binh Phuoc, Nha Rong, Nha Be, Binh Dien, Hoa An, Rach Cat, Thi Nghe, Tan Thuan, Ben Go). The principal parameters measured are pH, COD, BOD, NH_4, NO_3 and NO_2. Air is monitored in four areas in HCMC with a daily sampling frequency (Thu Duc, Tan Son Nhat, SOSTE, District 1). The parameters measured are TSP, NO_x, SO_2. Beside these sampling points, CEFINEA (with financial support from SOSTE) has also measured traffic pollution at two measuring points located at Phu Lam and Hang Xanh where traffic density is highest.

3 Environmental impact assessment

According to the environmental regulations issued in 1993, EIA reports must be prepared for all projects. General guidelines for EIA reports were approved in 1994. There are no guidelines for special projects, such as petroleum, hospital, agriculture, hydropower stations, etc., or for EIA evaluations. The qualifications of the consultants doing the actual assessment are not defined nor do the Vietnamese consultants always have the required know-how and experience. There is no standardised cost for conducting EIA reports (elsewhere, this is 0.5 to 1 per cent of the total investment cost).

In the case of EIAs which have to be evaluated by SOSTE/ENCO (i.e. EIAs for the smaller projects), it will be contacted by either the foreign investor or the Vietnamese consultant appointed by the foreign investor to receive information about local and national environmental regulations. In the normal case, SOSTE provides information on common regulations to the investor and at the same time introduces them to a Vietnamese capable of preparing an EIA report. The investor contacts the consultant and signs a contract

concerning report procedures, costs, conditions, etc. The Vietnamese consultant will do the environmental survey, collect basic data from the project site and prepare the report in accordance with the guidelines from NEA. SOSTE will then establish an Evaluation Board which will evaluate the report.

The requirement that all existing factories have to present an EIA report must be questioned. EIAs are an instrument related to new investment, and not appropriate for assessing the environmental impact of existing plants. There are also practical problems. The large number of factories precludes an enforcement of this requirement, and the quality of the reports is low because there is a lack of knowledgeable people. Consequently, EIA reports are copied from one factory to another.

4 Regulatory activities

4.1 Licensing

As in Hanoi, an environmental agreement is required for all enterprises before a license is issued, whether these require an EIA or not. In the case of an investment project requiring an EIA, a positive report by the Evaluation Board is also required. The project must then be submitted to the State Committee for Cooperation and Investment for issuing the investment license.

4.2 Compliance monitoring and enforcement

Apart from the inspections discussed below, SOSTE has also carried out an "Industrial Pollution Survey" between 1991 to 1993, in which more than 40 factories were inspected two to three times per month for air pollution, wastewater and solid waste. The project was supported financially by NEA. In the second phase of this project, 500 large and medium factories are going to be inspected. SOSTE has also undertaken a project to document air pollution caused by traffic.

Inspections

All industries, hospitals and export processing zones should be inspected, but as there are about 700 large- and medium-scale factories as well as 24,000 family-run workshops, and as SOSTE's budget and equipment are very limited, no regular inspections are carried out by SOSTE. Inspections only take place after written complaints. There are two or three such inspections every week. After receiving the letter, inspectors from SOSTE contact the relevant DEA and the two agencies jointly prepare the activities. They fill in an inspection form, arrange for a permission, contact the contracting laboratory and inform the factory that they will make an inspection.

SOSTE and DEA staff can also carry out a sudden inspection. During the inspection, SOSTE will fill in an inspection protocol with the name of the company, raw

material, products, pollution problem, analytical results, etc. This is signed by the factory management. The inspector then prepares a report under the supervision of Chief of Inspector and submits this to the Chairman of SOSTE.

If the inspection results show that the company violates the environmental standards, SOSTE, in co-operation with the DEA, will decide the form of penalty. The company may be permanently or temporarily closed down or have to pay a fine. The fine depends on the size of the company and on the level/type of pollution and varies between 100,000 to 1,000,000 VND. The decision to close a factory will be made by the PC and announced to the public. Companies that have been forced to close down because they violate the standards are usually open again seven to ten days later. Large-scale companies have never been closed down because of the economic and employment effects. The only companies that have been fined or closed down are small-scale and private enterprises.

DEA staff have sometimes developed close relationships with the factories in their districts, which occasionally leads to conflicts of interest and questionable inspection results. DEA staff are also known to inform factories in advance when an inspection is planned.

Parameters included in the inspection protocol

Depending on the factories, raw materials used, products, processes, etc., the following pollution sources are measured: 1) air pollution: temperature, humidity, TSP, SO_2, NO_x, lead and hydrogen chloride; 2) noise: noise level, vibration; 3) solid waste: quantity, inorganic matter, organic matter, hazardous waste; 4) wastewater: pH, alkalinity, colour, BOD, COD, nitrogen, phosphate, heavy metals, toxic compounds. Standards are concentration-based rather than mass-based.

Contracting laboratories and calibration control

Before 1993, SOSTE had subcontracts with CEFINEA and EPC (for the analysis of water and air pollution), and with Analytical Centre No 3 and the Institute of Hygiene (for water analysis). SOSTE has conducted a calibration exercise among the different laboratories where each laboratory received identical samples and were requested to follow a standard method. The results showed that the data generated from the different laboratories was varying up to 20 times when comparing the results from one sample. In order to solve this problem, SOSTE financed a project in 1994 on "Standard Methods for the Examination of Water, Wastewater and Air Pollution".

In 1993, SOSTE built a laboratory with a budget of more than US$ 100,000 that they received from NEA and from the PC; and in 1994 the laboratory received additional equipment worth approximately US$ 70,000 from an ADB project.

5 Reporting and public information

SOSTE has published a "Black Book" which lists 43 of the most polluting factories. The book includes many paper and textile mills and food processing factories. SOSTE also prepared a report on the "Current State of Environment in Ho Chi Minh City 1994". The basic data have also been used for the "Ho Chi Minh City Environmental Master Plan" - an ADB project with a budget of US$ 500,000.

The data from projects, programmes, inspections, etc., are stored as hard copies of reports or as computerised data. SOSTE was to be connected to the Internet at the end of 1995.

6 Human resources issues

ENCO employed nine people with a university degree in the central office and 20 - 30 representatives at 18 districts. One person has graduated from HCMC University of Economics, four persons have a bachelor's degree (nuclear science, chemical engineering or biology) and one has a masters degree in environmental engineering (AIT). All have received overseas training in environmental management supported by the Ministry of Environment, Singapore, but the staff still lacks know-how on environmental technology and management. Staff are not in a position to offer advice to enterprises.

DEAs are staffed by one or two persons. The DEA is under the District PC although their activities are directed by SOSTE. Staff lacks environmental know-how. Recently, 30 persons from the DEAs were sent to Singapore to attend training courses. ENCO has 4 staff managing the communication with the 18 districts. They have to handle all environmental problems, such as industrial inspection, evaluation of EIA reports, etc.

ENCO would like to enhance the knowledge on environmental management among all the staff by organizing a one week training course on environmental protection. In 1995, it arranged a one week training programme on solid waste management supported by the Ministry of Environment, Singapore. SOSTE should provide more attractive wages and increase the number of staff to meet the demand for a more intense supervision of the industries. Staffing decisions, however, are made by the HCMC PC.

ANNEX 3c

CASE STUDY OF INDUSTRIAL ENVIRONMENTAL MANAGEMENT IN VINH PHU

Table of contents

1 Organizational structure of Vinh Phu's Service of Science, Technology and Environment and its relations with other organizations

1.1 Organizational structure and responsibilities

SOSTE in Vinh Phu is responsible for all matters in the field of science, technology and environment in the province. Environmental activities, for which the Centre for Environmental Management was responsible, until 1995, include implementing governmental directives, designing provincial environmental decrees to the various departments/organizations belonging to the PPC and providing guidance on how to implement the decrees.

In 1995, it was announced that SOSTE's environmental services were to be reorganized into a Department of Environmental Monitoring and Analysis, a Department of Environmental Inspection and Control, a Department of Environmental Planning and Engineering and Administrative Services. SOSTE was also to be given the task of acting as an environmental referee, assisting in a civil court on legal actions related to companies violating environmental regulations.

SOSTE annually receives 40 million VND from PPC for salaries. There is also a growing budget for equipment (180 million VND in 1995). Additionally, it receives 200 to 400 million from MPI for special projects such as provincial surveys, environmental strategies at district level and for Viet Tri City (the main industrial centre). A Master Plan of Environmental Protection of the Province in the Period 1995-2000 has been drafted by SOSTE and is waiting for approval by the PPC. A draft of a Biodiversity and Clean Technology Project for the province has also been prepared.

1.2 Sharing administrative responsibilities with other local authorities

At the moment there is no clear distinction between the responsibilities of SOSTE and other organizations for implementing LEP. Responsibilities in the field of industrial environmental management are shared with the Department of Public Health (DOPH). However, the interest and experience of DOPH is only in the field of industrial hygiene (related to working conditions), whereas SOSTE focuses on the environment e.g. waste water, air pollution, solid waste and ecological effects.

When operating in the districts, SOSTE usually contacts the Planning and Administration unit under the district PC. The district is also often invited to participate in inspections and the district PC always receives one copy of the inspection protocol. SOSTE has the overall responsibility and does not delegate any responsibility to the districts, although this is legally possible.

The Department of Industry (DOI) is responsible for all public-sector industries in the

province. SOSTE has good access to all DOI's production data on the enterprises. To get the data from state owned enterprises (Ministry of Industry etc.), SOSTE has to contact either the Ministry or the enterprise itself. Unfortunately, DOI does not actively work with SOSTE to design a pollution control programme for the industries or to develop a sustainable industrial development strategy for the province.

Responsibilities and coordination mechanisms for solid waste management are not yet clear. It is SOSTE's task to ascertain that all procedures related to transport, disposal, storage and treatment of solid wastes meet the standards set by NEA/MOSTE. However, the Department of Construction (DOC) and the Urban Environmental Company (URENCO) also have responsibilities with regard to solid waste. SOSTE discovered that one lake within the Viet Tri city limits had been largely filled with domestic solid waste from URENCO and solid waste from a cement factory. SOSTE and DOC have jointly solved the problem by finding a suitable location for dumping solid waste. Responsibilities of SOSTE, DOC and URENCO also overlap in the case of water supply.

The police have co-operated with SOSTE during difficult factory inspections and a control of "cong nong" trucks (domestically-made trucks), which are major air polluters. There is, however, no close co-operation, as traffic pollution is the responsibility of Department of Transportation and Communication.

SOSTE has not yet been involved in environmental problems related to "green" issues such as natural conservation (e.g. Tam Dao and Xuan Son), forest depletion and soil erosion. These environmental problems are under the responsibility of the Department of Agriculture and Rural Development. However, SOSTE should have the responsibility to implement environmental standards related to forest protection and natural conservation, and make sure that the Department is complying locally with the standards through a reforestation and conservation programme.

2 Ambient standards and monitoring

The present environmental quality standards of Vinh Phu were issued in late 1993. They originate from other countries, Hanoi City, WHO and the Ministry of Public Health. The standards for ambient air consist of 129 compounds, for ambient water of 134 compounds and for the working environment of 98 compounds. The national environmental standards developed by MOSTE/NEA are not applied in Vinh Phu Province because some of these are not considered to be sufficient to protect human health (the SO_2 standard developed by MOSTE/NEA, for example, was relaxed from 0.05 mg/m^3 to 0.5 mg/m^3). SOSTE has recommended that NEA review some of the standards. NEA has responded that these are the responsibility of the General Department of Standardization, Metrology and Quality Control.

There is no organized environmental monitoring programme in Vinh Phu, although there are data from research and inspections. SOSTE has asked EPC in HCMC to assist

them in producing pollution maps from the existing available data, but due to limited financial resources EPC had to reject their proposal. MOSTE/NEA has not provided directives or technical assistance to SOSTE for establishing an environmental monitoring station, but it has provided an annual budget to purchase equipment for an environmental laboratory. PPC has also submitted a proposal for a regional environmental monitoring network to MOSTE/NEA for financing.

3 Environmental impact assessment

On behalf of the People's Committee of Vinh Phu Province, SOSTE has the right to request, screen, review and comment on environmental aspects of all development projects in Vinh Phu Province before these projects are approved. There is no legislative document that regulates the issue of who should execute EIAs. SOSTE has usually been acting as a broker to help the industry to contact a suitable expert (research institutes or consultancy firms) in Hanoi or HCMC. Due to the limited number of experienced and capable institutions, the few available institutes work under high pressure.

SOSTE has only been involved in reviewing five small projects with a value of up to 500 million VND. EIAs for large-scale projects are screened by NEA and only passed on to SOSTE for information. Altogether, EIAs have only been made of 20 enterprises in the province. While there are legal arguments for executing EIAs in the context of City Master Plans or industrial zone master plans, there is no legislative framework that ensures the participation of various departments, including SOSTE, in this process. At present, no EIAs are made with this purpose in mind, and SOSTE only participates in the preparation of these plans on an ad-hoc basis.

The EIA Evaluation Board is composed of representatives from different departments, such as DOI, DOC and SOSTE, and is chaired by SOSTE. Evaluation follows a standard protocol developed by NEA, which describes the project activity and rates it as accepted, accepted after technology improvements, need to change technology or relocate the enterprise or not accepted. So far no disputes have occurred over the evaluation of the EIA reports. It is not easy for Board members to challenge the specialists used by the enterprises because opportunities to consult independent experts in these fields are limited. In addition, the public cannot participate in the reviewing and approving process, and no regulation ensures that EIAs are made publicly available.

In conclusion, SOSTE staff need to be trained in evaluating EIA reports. EIA reports of development projects at the national level should be submitted to SOSTE for comments before being approved by MOSTE. Financial resources should be allocated from the EIA preparation cost and given to the Board for hiring an objective and neutral expert. The EIA process should involve public participation to maximize the likelihood of an objective and neutral assessment.

4 Regulatory activities

4.1 Licensing

As in Hanoi and HCMC, an environmental agreement is required before a license is issued to an enterprise. New investment projects are subject to an EIA procedure (see above) on the basis of which an environmental license is issued which includes specific conditions with regard to process technology and waste treatment facilities. These are the basis for future inspections.

4.2 Compliance monitoring and enforcement

There is no separate Environmental Inspection Board in Vinh Phu. SOSTE has 8 inspectors in 4 groups, each group being responsible for about 35 enterprises. One periodic inspection is conducted about every six weeks. Serious polluters are visited more often. If an environmental incident occurs or if residents complain, SOSTE also sends inspection teams.

There are 132 industrial enterprises of which 37 are state-owned enterprises.All of these exceed the environmental standards. Up to August 1994 about 112 factories were subject to inspections. The most polluting factories are Lam Thao Fertilizer and Chemicals Company, Vinh Phu Paper Mill and Bai Bang Paper and Pulp Mill. The first of these has now developed a pollution control plan with SOSTE. The Vinh Phu Paper Mill has done likewise, but may be closed nevertheless, as both SOSTE and NEA have requested closure. The major obstacle to closure is that many people (about 1,000) will lose their jobs.

Periodic inspections

In the case of periodic inspections, the factory will be informed one week in advance by SOSTE. SOSTE's staff will take samples of parameters such as pH, BOD, H_2S, noise, dust etc., and analyze them (or have them analyzed). If the inspection results prove that a regulation was violated, SOSTE will decide on follow-up action and decide on a penalty. However, violations have so far been settled mainly on the basis of negotiation, and SOSTE is the mediator in case a third party is involved. Penalties are not high enough to encourage improvements, and at present periodic inspections are mainly a tool to raise awareness on environmental protection in the factory. In some cases, SOSTE has provided enterprises with advice on pollution reduction. Little has been done so far to stimulate the introduction of cleaner production alternatives.

The inspection fee is paid by the enterprise, and consists of an administration fee where the size depends on the number of employees (< 100 persons - 50.000 VND, < 400 persons - 100.000 VND and > 400 persons - 150.000 VND) and an analytical fee for the parameters analysed. SOSTE keeps 60 per cent of the administration fee to cover costs and

to reward inspectors; 40 per cent go to the Department of Tax. If SOSTE analyzes the samples, it keeps the analytical fee.

Sudden inspections

This inspection takes place when SOSTE receives complaints from offices or people in the surrounding area. The complaints must be delivered by either a written letter or a personal visit to SOSTE. Complaints delivered by telephone are not accepted. SOSTE has received 32 complaints about environmental violations and has actively responded to 25 cases.

If a sudden inspection is held, both parties are informed about the results within a week. If one of the parties does not agree with the results, SOSTE will conduct an inspection. If the inspection proves that the factory has violated the regulations, the inspection fees will be paid by the factory; if this is not the case, the plaintiffs bear the costs (this has not occurred yet). In the case of violation, SOSTE assists in estimating the economic losses that the plaintiffs have suffered. The two parties then negotiate about the economic compensation.

Although pollution has reportedly been reduced (i.e. no further complaints were received) after sudden inspections and although four factories have been closed down, there is no really effective system for penalizing violators. There has only been one case of a sudden inspection leading to compensation by an enterprise. In late 1994, the environmental impact of the Lam Thao Superphosphate and Chemical Company on six communes in Tam Thanh District were investigated. The outcome was that the company had to compensate the affected communes. This it did by providing its own fertilizer to the communes. SOSTE acted as a mediator during the negotiations.

Parameters included in the inspection protocol

The inspection protocol used has been developed by SOSTE itself without assistance from any other organization. Inspectors will look at water and air pollution and at solid waste. SOSTE has developed a list describing the most frequent pollution problems that is based on the following criteria: pollution load, pollution level and visible environmental impact. Waste water and gas emissions are the greatest problems. The parameters have not been classified in detail yet by SOSTE. Standards are concentration rather than mass-based.

As SOSTE does not have the resources to cover all types of pollution, it should limit the number of standards to be monitored and controlled to, say, 20 compounds. The standards should include basic parameters of general concern (pH, DO, BOD, COD, etc.) and key human health parameters such as TSP, SO_2, lead and mercury.

Contracting laboratories and calibration control

SOSTE has contracted laboratories at the Viet Nga Institute for Tropical Technique in

Hanoi, CESUIA at Hanoi University of Civil Engineering and the Centre for Occupational Health at the Ministry of Industry in Hanoi for analytical work. Laboratory staff collect samples during inspections in the presence of a SOSTE staff member who signs the protocol showing that the correct samples were taken. SOSTE indicates where the samples are to be taken, but because of technical difficulties this is restricted to waste water. The contracting laboratories are paid for the analyses either directly by the enterprises or via the SOSTE. Only results that meet their requirements are accepted by SOSTE. Both the enterprise and SOSTE will receive a copy of the analytical protocol.

SOSTE assumes that the laboratories have adequate equipment and skills. There is no calibration control as there are no technical guidelines for the laboratories on how to collect, prepare or analyse the samples. In order to produce reliable data and information, the contracting laboratories should be calibrated and licensed by SOSTE to ensure the quality of the analytical services.

Equipment for inspections, monitoring and data storage

Analysis of the samples is done either by portable equipment with direct measurements or in the laboratory. SOSTE's laboratory has the following equipment:

- pH-meter;
- DO-meter;
- Electrical balance;
- H_2S analyser;
- Noise meter;
- Gas sampling equipment.

New SOSTE laboratory facilities for inspections as well as environmental monitoring of the province are expected to become available in 1996. There would, among others, still be a need for additional portable equipment for in-situ air and water quality measurements. There is a shortage of consumables, for which no budget is available. Data are usually stored on paper. There are plans to computerize the data storage. The single available computer is not powerful enough to be used for data storage.

5 Reporting and public information

Every year, SOSTE prepares an annual environmental report, which is distributed to MOSTE/NEA, MPI and PPC. SOSTE also publishes articles on the environment in its quarterly magazine "Information on Science, Technology and Environment". A special issue on the Environment Situation of Vinh Phu was published in 1995, which also reported about environmental activities and regulations.

SOSTE has used the local broadcasting station to inform about pollution, World Environment Day and environmental improvement campaigns. SOSTE uses the media four

or five times per year and would like to use the media more frequently.

6 Human resources issues

SOSTE's environmental staff consists of one Director, one Deputy Director and nine staff, of which four are working on a contract-basis. In 1996, following a PPC decision, the number of staff will probably increase to 16 to allow SOSTE to handle the growing environmental management activities.

One staff member has been trained in environmental technology (short-term training course in Thailand). Others have participated in short-term training programmes in Hanoi, HCMC and Vinh Phu in the fields of pollution control and environmental impact assessment. None of the staff had previous experience with practical analytical laboratory work before joining SOSTE. Staff needs additional training in EIA, inspection, environmental monitoring, industrial pollution control and practical analytical work. SOSTE is arranging English training courses for all staff, four times per week during a seven month period.

SOSTE has organized conferences and seminars on environmental issues for its own staff, other provincial authorities and factory managers. Topics have included basic environmental knowledge, environmental engineering and analysis, EIA and waste water management.