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Verlag Dr. Grüb, Nachf.

## **Industry and Environment**



**United Nations Industrial Development Organization**

# **Industry and Environment**

**A Guide to Sources of Information**



**Verlag Dr. Grüb, Nachf.**

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## FOREWORD

I welcome the publication of this much-needed addition to the literature on industry and the environment. As chief officer of the United Nations Industrial Development Organization (UNIDO), it is appropriate for me to outline briefly the motives for its publication and the means by which it came about.

UNIDO is the United Nations agency with prime responsibility for furthering industrialization in developing countries. As such, it must come to terms with a field of operations that is staggering in its scale, range, complexity and rate of change. Most of the lessons learned ultimately relate to the interdependence of the various spheres of economic and intellectual endeavour. A classic example is the topic of environmental impact. Environmental science and technology are multidisciplinary, while the problems they address respect neither sectoral nor national boundaries.

We have an inherent interest in the sustainability of the industries we promote; we do not want our projects to create the conditions of environmental collapse. As industrialization has spread, so it has become increasingly evident that environmental deterioration is not a problem of the North alone. It is a growing threat to the sustainability of development itself.

In countries where needs are pressing, money is short and industry in its early stages, the temptation to regard environmentally responsible technology as an expensive luxury is understandable. Yet experience teaches that competitive advantages based on ignoring environmental impacts are illusory, and the resultant damage is costly to correct, if not irreversible. Merely to point the finger of blame at industries that pollute, deplete resources without thought to the future, or cause harmful wastes, is neither just nor helpful. Indeed, if anything, the motives for overcoming such practices are most urgent in developing countries. For instance, in countries that suffer from chronic power shortages, there is usually no lack of awareness of the need for energy efficiency.

All too often, what is missing is access to existing clean, low-waste technologies. And since no one has all the answers, such technologies can only become available through international cooperation. UNIDO therefore sees the promotion of the transfer of environmentally sound technology as one of its central goals. The first step to such exchange is information. Technologists, industrialists and Governments must be conscious of the options open to them, and of the sources of expertise and innovation. In fact, to coin a phrase, sound information is as important as clean air, for increasingly, the latter depends on the former.

UNIDO has taken steps to ensure that the necessary priority is accorded to environmental issues in its work. An organization-wide environment programme was launched in 1990. Inevitably, industrial and technological information emerged as a crucial element. Equally inescapable was the conclusion that UNIDO must start by putting its own house in order, and accordingly, an internal awareness programme was initiated, with the aim of building environmental evaluation and know-how into all UNIDO projects. A major milestone in the efforts of the Organization to place environmental issues at the forefront of its mission is the Conference on Environmentally Sustainable Industrial Development, to be held at Copenhagen, Denmark, in October 1991.

The Organization, and the United Nations system as a whole, generates vast quantities of relevant data. The question is how to marshal this information so as to make it available to all who need it, inside and outside headquarters. A problem on this scale can only be tackled with modern information technology, particularly as much of the material is held in data bases.

The solution is to create a computerized system that both contains factographic (factual) data and refers users to sources of information on energy and environmental issues. The Referral Database on Energy and Environment (REED) reached the implementation stage in April 1991. It is both a

large database and an in-house computerized network, the latter feeding information to the former. The network, consisting of focal points that cover all relevant areas of UNIDO operations, is operated by specially trained data entry and retrieval staff. REED injects environmental and energy know-how into the activities of the Organization, and processes information arising from those activities, so that it can be shared via the database and network. REED is the core of a wider concept, known as "Cleantec Data", involving access and referral to outside databases, including commercial ones. In fact, UNIDO is already cooperating with the owners of two major commercial databases that have been integrated in the system.

In establishing REED as the main institutional 'memory' of UNIDO for environmental and energy matters, the prime intention was to meet the needs of the widest possible public. A number of institutional channels already exist, notably the UNIDO Industrial and Technological Informa-

tion Bank (INTIB), which serves a global user community. In the course of setting up the new REED referral system, it soon became apparent that it could also provide the basis for a printed guide to information sources. This became the work I am now honoured to introduce.

As specialist suppliers and users of information know, the mere existence of sources and bibliographies is no guarantee of rapid and successful research. The use of sources is an art in itself, yet it is one too seldom taught. I therefore direct the attention of all who have recourse to this book to the excellent introduction, contributed by the World Federation of Engineering Organizations. The advice on analysing problems, structuring queries and relating them to information sources and services is an invaluable aid to use of the data sections.

I trust that scientists, engineers and decision-makers in industry and government will find *Industry and Environment: A Guide to Sources of Information* a useful reference in their field.

Domingo L. Siazon, Jr.  
Director-General

United Nations Industrial Development Organization

## AVANT-PROPOS

Cet ouvrage qui vient s'ajouter aux ouvrages sur l'industrie et l'environnement répond à une nécessité et elle est la bienvenue. Il me revient, en tant que Directeur général de l'Organisation des Nations Unies pour le développement industriel (ONUDI), d'exposer brièvement les raisons pour lesquelles cet ouvrage a été publié et la façon dont la tâche a été menée.

L'ONUDI est l'institution des Nations Unies à laquelle il incombe au premier chef de promouvoir l'industrialisation dans les pays en développement. A ce titre, elle doit s'adapter à un domaine d'activité dont l'ampleur, la diversité, la complexité et le rythme d'évolution sont saisissants. La plupart des leçons que nous avons tirées portent finalement sur l'interdépendance des diverses sphères d'activités économiques et intellectuelles. Un exemple classique en est la question des incidences sur l'environnement. L'écologie et la technologie sont pluridisciplinaires alors que les problèmes qu'elles traitent ne connaissent ni limites sectorielles ni frontières nationales.

Nous nous intéressons par définition à la durabilité des industries que nous encourageons; nous ne voulons pas que nos projets créent des conditions néfastes pour l'environnement. A mesure que l'industrialisation s'est répandue, il est devenu de plus en plus évident que la détérioration de l'environnement n'est pas un problème du Nord uniquement, c'est une menace qui pèse de plus en plus sur la poursuite du développement lui-même.

Dans les pays dont les besoins sont pressants, les ressources financières précaires et l'industrie à ses débuts, la tentation de considérer l'incidence de la technologie sur l'environnement comme un luxe onéreux est compréhensible. Pourtant, l'expérience enseigne que les avantages compétitifs fondés sur l'ignorance des incidences sur l'environnement sont illusoire et les dégâts causés sont lourds à réparer s'ils ne sont pas irréversibles. Se contenter de blâmer les industries qui polluent, épuisent les ressources sans

tenir compte de l'avenir ou causent des dégâts considérables n'est pas plus juste qu'utile. En réalité, les raisons de renoncer à ces pratiques sont des plus urgentes dans les pays en développement. Par exemple, dans les pays qui souffrent de pénuries chroniques d'énergie, on n'ignore habituellement pas le besoin d'une énergie efficace.

Comme trop souvent, ce qui manque est l'accès à des technologies propres produisant peu de déchets. Et comme personne ne dispose de toutes les réponses, ces technologies ne peuvent devenir accessibles que par la coopération internationale. L'ONUDI par conséquent considère la promotion du transfert des technologies sans danger pour l'environnement comme l'un de ses objectifs essentiels. La première étape dans cette voie est l'information. Les technologues, les industriels et les gouvernements doivent avoir conscience des choix qui s'offrent à eux et connaître les sources d'expertise et d'innovation. En fait, on peut dire qu'une information de qualité est aussi importante que la pureté de l'air car de plus en plus la seconde dépend du premier.

L'ONUDI a pris des mesures pour assurer que le degré de priorité voulu est accordé aux questions de l'environnement dans ses activités. Un programme sur l'environnement à l'échelle de l'Organisation a été lancé en 1990. Inévitablement, l'information industrielle et technologique est apparue comme un élément crucial. Egalement incontournable a été la conclusion selon laquelle l'ONUDI doit commencer par mettre de l'ordre chez elle et, par conséquent, un programme interne de sensibilisation a été inauguré en vue d'intégrer une évaluation et des connaissances techniques sur l'environnement dans tous les projets de l'ONUDI. Un élément majeur dans les efforts de l'Organisation pour placer les questions de l'environnement au premier rang de ses activités est la réunion de la Conférence sur le développement industriel et l'environnement, qui se tiendra à Copenhague



(Danemark) en octobre 1991.

L'Organisation et le système des Nations Unies dans son ensemble produisent de grandes quantités de données sur le sujet. La question est de savoir comment rassembler ces informations pour que tous ceux qui en ont besoin, au Siège comme à l'extérieur, puissent les utiliser. Un problème de cette importance ne peut être traité que par une technologie moderne de l'information, particulièrement si l'on considère que le matériau est contenu dans des bases de données.

La solution consiste à créer un système informatisé qui contienne des données factuelles et renvoie les utilisateurs aux sources d'information sur les questions de l'énergie et de l'environnement. La base de données de références sur l'énergie et l'environnement (REED) en est arrivée au stade de l'application en avril 1991. C'est à la fois une vaste base de données et un réseau interne informatisé, ce dernier alimentant le premier en informations. Le réseau consiste en éléments qui couvrent tous les domaines pertinents des activités de l'ONUDI, et il est exploité par un personnel spécialement formé au stockage et à la recherche de données. REED introduit des connaissances techniques sur l'environnement et l'énergie dans les activités de l'Organisation et traite l'information produite par ces activités, de sorte que l'information peut être communiquée à d'autres utilisateurs par la base de données et le réseau. REED est au centre d'un ensemble plus vaste connu sous le nom de "Cleanteq Data", qui comporte l'accès et le renvoi à des bases de données extérieures, notamment commerciales. En fait, l'ONUDI coopère déjà avec les propriétaires de deux grandes bases de

données commerciales qui ont été intégrées dans le système.

En créant REED comme la principale "mémoire" institutionnelle de l'ONUDI pour les questions d'environnement et d'énergie, l'intention première était de répondre aux besoins du plus large public possible. Un certain nombre de moyens de communication institutionnels existent déjà, en particulier la Banque d'informations industrielles et techniques de l'ONUDI, qui dessert une vaste communauté d'utilisateurs. Au cours de la mise sur pied du nouveau système de référence REED, il est apparu rapidement que le système pourrait également servir de base à un guide imprimé sur les sources d'information. L'ouvrage que j'ai maintenant l'honneur de vous présenter est le fruit de cette réflexion.

Comme les spécialistes de la fourniture et de l'utilisation de l'information le savent, la simple existence de sources et de bibliographies n'est pas la garantie d'une recherche rapide et efficace. L'utilisation de sources est un art en soi, encore qu'on ne l'enseigne que trop rarement. C'est pourquoi j'appelle l'attention de tous ceux qui utiliseront cet ouvrage sur l'excellente introduction fournie par la Fédération mondiale des organisations d'ingénieurs. Les conseils sur l'analyse des problèmes, la structure des questionnaires et les moyens de les relier aux sources et aux services d'information sont une aide précieuse pour l'utilisation des données.

J'ai la certitude que les scientifiques, les ingénieurs et les décideurs dans l'industrie et dans les administrations publiques trouveront, dans *L'industrie et l'environnement: un guide sur les sources d'information*, un instrument de référence utile dans leurs travaux.

Domingo L. Siazon Jr  
Directeur général

*Organisation des Nations Unies pour le développement industriel*

# VORWORT

Ich begrüße die Veröffentlichung des vorliegenden Bandes als dringend benötigte Ergänzung zur Literatur über Industrie und Umwelt. Als Leiter einer der beiden als Verfasser und Herausgeber fungierenden Organisationen möchte ich in einigen Worten berichten, wie und aus welchen Gründen es zu dieser Veröffentlichung kam.

Die Organisation der Vereinten Nationen für industrielle Entwicklung trägt im Rahmen der Vereinten Nationen die Hauptverantwortung für die Förderung der Industrialisierung in den Entwicklungsländern. Dabei hat sie es mit einem Tätigkeitsbereich zu tun, der in Umfang, Reichweite und Komplexität ebenso überwältigend ist wie der rasche Wandel, der in diesem Bereich vor sich geht. Immer wieder wird man dabei mit dem Faktum konfrontiert, wie eng die verschiedenen Aspekte des wirtschaftlichen und des geistigen Strebens miteinander verbunden sind. Ein klassisches Beispiel ist die Frage der Umweltverträglichkeit. Die Umweltwissenschaft und -technologien sind multidisziplinär, so wie sich die Probleme, zu deren Lösung sie eingesetzt werden, weder an die engen Grenzen eines bestimmten Industriezweigs noch an Landesgrenzen halten.

Es ist uns daher sehr an der Umweltverträglichkeit der von uns geförderten Industrie gelegen; wir wollen nicht, daß unsere Projekte den Zusammenbruch der Umwelt herbeiführen. Mit fortschreitender Industrialisierung gelangte man zu der Erkenntnis, daß die Umweltschädigung nicht nur ein Problem des Nordens ist. Sie stellt vielmehr die dauerhafte Entwicklung als Ganzes in Frage.

In Ländern, in denen Not herrscht, wenig Geld vorhanden ist und die Industrie noch am Anfang steht, ist die Versuchung groß, umweltschonende Technologien als kostspieligen Luxus anzusehen. Die Erfahrung lehrt jedoch, daß Wettbewerbsvorteile, die durch die Mißachtung von Umweltkonsequenzen erzielt werden, trügerisch sind und daß die Beseitigung der verursachten Schäden, so sie überhaupt wieder gutgemacht

werden können, viel Geld kosten. Immer nur die Industrien an den Pranger zu stellen, die die Umwelt verschmutzen, unbekümmert Raubbau an den Ressourcen betreiben, ohne sich Gedanken über die Zukunft zu machen, oder gefährliche Abfälle produzieren, ist weder gerecht noch konstruktiv. Die Entwicklungsländer haben allen Grund, darauf zu drängen, daß diese Praktiken raschest eingestellt werden. In Ländern, in denen chronischer Strommangel herrscht, wird man beispielsweise feststellen, daß man sich dort der Notwendigkeit der optimalen Energieausnutzung durchaus bewußt ist.

Allzu oft fehlt es einfach am Zugang zu vorhandenen umweltfreundlichen, abfallarmen Technologien. Und da niemand alles kann, kommt man an sie nur durch internationale Zusammenarbeit heran. Die UNIDO betrachtet daher die Förderung des Transfers unumweltschädlicher Technologien als eines ihrer vordringlichsten Ziele. Der erste Schritt in diese Richtung ist Information. Technologen, Industrielle und Regierungen müssen wissen, welche Möglichkeiten und welche Quellen für Fachwissen und Innovation ihnen offenstehen. Ich möchte behaupten, daß verlässliche Informationen ebenso wichtig sind wie reine Luft, da letztere in steigendem Maße von ersteren abhängt.

Die UNIDO hat durch entsprechende Maßnahmen dafür gesorgt, daß in ihrer Arbeit den Umweltbelangen die erforderliche Priorität eingeräumt wird. 1990 wurde ein Umweltprogramm gestartet, an dem alle Bereiche der Organisation beteiligt sind. Die industrielle und technologische Information hatte sich immer wieder als kritischer Punkt erwiesen. Und man gelangte zu der eindeutigen Erkenntnis, daß die UNIDO darangehen muß, ihr eigenes Haus in Ordnung zu bringen; in diesem Sinne wurde ein Sensibilisierungsprogramm eingeleitet, dessen Ziel es ist, in alle UNIDO-Projekte Umweltverträglichkeitsprüfungen und Umwelttechnologien einzubauen. Ein Schwerpunkt in den

Bemühungen der Organisation, der Umwelt in ihren Aktivitäten den gebührenden Stellenwert zu verschaffen, ist die Konferenz über umweltfreundliche industrielle Entwicklung, die im Oktober 1991 in Kopenhagen (Dänemark) stattfindet.

In der Organisation und im gesamten System der Vereinten Nationen fallen riesige Mengen von Daten an. Die Frage ist also, wie man diese Informationen managen soll, damit sie allen, die sie brauchen, innerhalb und außerhalb der Organisation zur Verfügung stehen. Ein Problem dieser Größenordnung kann man nur mit moderner Informationstechnologie in den Griff bekommen, vor allem deshalb, weil ein Großteil der Informationen in Datenbanken gespeichert ist.

Die Lösung besteht in der Schaffung eines computergestützten Systems, das einerseits faktographische Daten und andererseits Hinweise auf Informationsquellen für Energie- und Umweltfragen enthält. Das *Referral System on Energy and Environment* (REED) war im April 1991 einsatzbereit. Es handelt sich sowohl um eine umfangreiche Datenbank als auch um ein hausinternes Computer-Netzwerk, wobei letzteres erstere mit Informationen versorgt. Das Netzwerk umfaßt eine Reihe von Eingabe/Ausgabestellen in allen wesentlichen Arbeitsbereichen der UNIDO und wird von Fachkräften für Dateneingabe und -abfrage betreut. REED ergänzt die Aktivitäten der Organisation mit Umwelt- und Energie-Know-how und verarbeitet die aus diesen Aktivitäten gewonnenen Informationen, die dann über die Datenbank und das Netzwerk allgemein zugänglich sind. REED ist der Kern eines größeren Konzepts, das unter dem Namen "Cleantec Data" bekannt ist, das dem Zugriff auf externe, unter anderem auch kommerzielle Datenbanken dient und darüberhinaus als

Wegweiser zu diesen gedacht ist. Die UNIDO arbeitet bereits mit den Eigentümern von zwei großen kommerziellen Datenbanken zusammen, die schon in das System übernommen wurden.

Mit der Errichtung von REED als dem wichtigsten institutionellen "Speicher" der UNIDO für Umwelt- und Energiefragen wollte man in erster Linie einen möglichst großen Benutzerkreis ansprechen. Es gibt bereits eine Reihe von institutionellen Kanälen, etwa die *UNIDO Industrial and Technological Information Bank* (INTIB), die weltweit zahlreichen Benutzern offensteht. Als man daranging, das neue REED Referral System aufzubauen, stellte sich bald heraus, daß das System auch als Grundlage für einen gedruckten Führer zu Informationsquellen geeignet ist. So entstand das Werk, das ich heute nicht ohne einen gewissen Stolz vorstellen darf.

Wie erfahrene Informationslieferanten und -benutzer wissen, ist allein das Vorhandensein von Quellen und Bibliographien noch keine Garantie für eine rasche und erfolgreiche Nachforschung. Die Nutzung von Informationsquellen ist eine eigene Kunst, die leider nur selten gelehrt wird. Ich lege daher allen, die dieses Buch zur Hand nehmen, die ausgezeichnete Einleitung des Weltbundes von Ingenieursvereinigungen (WFEO) ans Herz. Die Ratschläge betreffend die Problemanalyse, die fachgerechte Formulierung von Auskunftersuchen und die Zuordnung zu Informationsquellen und -diensten sind eine wertvolle Hilfe bei der Nutzung der datenbezogenen Abschnitte.

Ich bin davon überzeugt, daß der vorliegenden Band *Industrie und Umwelt: Ein Wegweiser zu Informationsquellen* sich als nützliches Nachschlagewerk für Wissenschaftler, Ingenieure und Entscheidungsträger in Industrie und Politik erweisen wird.

*Domingo L. Siazon, Jr.*  
*Generaldirektor*  
*Organisation der Vereinten Nationen für industrielle Entwicklung*

## PRÓLOGO

Me congratula que esta obra, verdaderamente necesaria, venga a sumarse a la bibliografía sobre el tema de la industria y el medio ambiente. Como oficial principal de la Organización de las Naciones Unidas para el Desarrollo Industrial (ONUDI), procedo que indique brevemente los motivos de su publicación y los medios que la han hecho posible.

La ONUDI es el organismo de las Naciones Unidas que tiene la responsabilidad primordial de promover la industrialización de los países en desarrollo. Como tal, tiene que aprender a abordar un conjunto de actividades que asombra por sus proporciones, alcance, complejidad y rapidez con que evoluciona. La mayor parte de cuanto he aprendido últimamente se refiere a la interdependencia de las diversas esferas de actividad económica e intelectual. Un ejemplo clásico es el tema de los efectos sobre el medio ambiente. La ciencia y la tecnología del medio ambiente son de carácter multidisciplinario, mientras que los problemas que combaten no respetan ni límites sectoriales ni fronteras nacionales.

Estamos directamente interesados en que las industrias que promovemos sean sostenibles, y no queremos que nuestros proyectos creen las condiciones conducentes al colapso ambiental. A medida que la industrialización se ha ido generalizando, se ha visto cada vez más claro que el deterioro del medio ambiente no es sólo un problema de los países del Norte. Representa, por el contrario, una creciente amenaza a la viabilidad del propio desarrollo.

En los países donde las necesidades son imperiosas, el dinero es escaso y la industria se halla en sus fases iniciales de desarrollo, es comprensible la tentación de considerar como un lujo oneroso la tecnología no contaminante. Sin embargo, la experiencia enseña que son ilusorias las ventajas comparativas que puedan obtenerse a base de no conceder la menor importancia al aspecto ambiental, pues los daños resultantes son costosos de reparar, cuando no irreversibles.

Limitarse a echar la culpa a las industrias que contaminan, agotan recursos sin pensar en el futuro o producen residuos perjudiciales, ni es justo ni conduce a nada. Por cierto que, si hay motivos para eliminar tales prácticas, es en los países en desarrollo donde urge sobremanera hacerlo. Por ejemplo, en los países que padecen una escasez crónica de energía, suele tenerse conciencia de la necesidad de utilizarla eficientemente.

Con harta frecuencia, lo que hace falta es acceso a las tecnologías limpias, y que produzcan escasos residuos, ya existentes. Y, como nadie lo sabe todo, tales tecnologías sólo pueden obtenerse mediante la cooperación internacional. Por ello, la ONUDI considera, como una de sus metas principales, la promoción de la transferencia de tecnología ambientalmente sana. El primer requisito para la realización de tal intercambio es la información. Los tecnólogos, los industriales y los gobiernos deben ser conscientes de las posibilidades que se les ofrecen, y saber dónde están las fuentes de conocimientos especializados e innovadores. En realidad, por decirlo así, la buena información es tan importante como el aire limpio, pues, cada vez más, este último depende de la primera.

La ONUDI ha adoptado medidas para asegurar que, en el marco de su labor, se conceda la necesaria prioridad a las cuestiones ambientales. En 1990, se inició un programa sobre el medio ambiente al nivel de toda la Organización. Inevitablemente, la información industrial y tecnológica se reveló como elemento de crucial importancia. También fue incluíble la conclusión de que la ONUDI debía empezar por poner su propia casa en orden, y, en consecuencia, se inició un programa interno de concienciación, con objeto de incorporar a todos los proyectos de la ONUDI la evaluación y el "know-how" ambientales. La Conferencia sobre un Desarrollo Industrial Ecológicamente Sostenible, que se celebró en Copenhague (Dinamarca) en octubre

de 1991, constituye un hito importante en los esfuerzos de la Organización por situar las cuestiones ambientales en el primer plano de su misión.

La Organización, y el sistema de las Naciones Unidas en su conjunto, generan enormes cantidades de datos pertinentes. La cuestión es cómo ordenar y clasificar esta información con objeto de que puedan disponer de ella quienes la necesitan, tanto dentro como fuera de la sede. Un problema de esta envergadura sólo puede abordarse mediante una moderna tecnología de la información, sobre todo porque gran parte de la información se conserva en bases de datos.

La solución consiste en crear un sistema informatizado que contenga datos factográficos (factuales) y que remita a los usuarios a fuentes de información sobre cuestiones relativas a la energía y al medio ambiente. La Base de Datos de Referencia sobre Energía y Medio Ambiente (REED) entró en la fase de aplicación en abril de 1991. Se trata de un sistema en el que una red informatizada interna proporciona información a esa importante base de datos. La red, consistente en puntos focales que cubren todas las áreas pertinentes de las operaciones de la ONUDI, está a cargo de personal especialmente capacitado en la introducción y recuperación de datos. La REED aporta a las actividades de la Organización "know-how" sobre el medio ambiente y la energía, y procesa información derivada de estas actividades, de modo que esa información pueda compartirse a través de la base de datos y de la red. La REED constituye el núcleo de un concepto más amplio conocido como "Cleantec Data" (Datos sobre tecnología limpia), que abarca el acceso y la remisión a bases de datos externas,

incluidas las de carácter comercial. En realidad, la ONUDI ya está cooperando con los propietarios de dos importantes bases de datos comerciales que se han integrado en el sistema.

Al establecer la REED como principal "memoria" institucional de la ONUDI para las cuestiones relativas al medio ambiente y a la energía, la primera idea era satisfacer las necesidades de un público lo más numeroso posible. Existe ya cierto número de canales institucionales, en especial el Banco de Información Industrial y Tecnológica de la ONUDI (INTIB), que atiende a una comunidad de usuarios de todo el mundo. Durante el establecimiento de la nueva REED, pronto se hizo evidente que también podría servir de base para la impresión de una guía de fuentes de información. Esta *Guía* es la obra que ahora tengo el honor de presentar.

Como saben los proveedores y usuarios de información especializados, la simple existencia de fuentes y de bibliografías no garantiza una rápida y eficaz investigación. Saber cómo utilizar las fuentes es un arte en sí, pero que escasamente se enseña. Por ello, señalo a la atención de cuantos se sirvan de este libro la excelente introducción al mismo de la Federación Mundial de Organizaciones de Ingenieros. El consejo sobre la forma de analizar problemas, estructurar consultas, y saber a qué fuentes y servicios de información hay que recurrir, constituye una inestimable ayuda para la utilización de las secciones de datos.

Espero que para los científicos, los ingenieros, y quienes deciden en la industria y en los gobiernos, la presente publicación *Industria y Medio Ambiente: Guía de Fuentes de Información* sea un instrumento de consulta útil en sus respectivas esferas de actividad.

*Domingo L. Siazón Jr.*  
*Director General*  
*Organización de las Naciones Unidas*  
*para el Desarrollo Industrial*

## FOREWORD

The Committee on Engineering Information of the World Federation of Engineering Organizations (WFEO) has contributed, together with the United Nations Industrial Development Organization (UNIDO), to the preparation of this Guide, which lists all the information sources that may be of use in providing better solutions to environmental problems.

Every engineer and every industrial operator, whatever his area of activity and whatever his function, is or one day will be faced with environmental problems. If he is able to design and apply techniques that, while certainly the most competitive, are also and above all the least damaging to the environment, the engineer requires varied and specific information, appropriate to each situation, to the organization he works for, and to the country concerned. A need, therefore, existed for a method by which to gain control of this complex and multidimensional information. This *Guide*

presents such a method, which is based on an analysis of the critical requirements and factors to be considered with regard to environmental information, and which also introduces certain criteria for the selection of information sources. The large number of these sources led to the compilation of a systematic list on a country by country basis. It is this feature that constitutes the principal attraction of this *Guide*, which every enterprise and every engineer should have and be familiar with. The World Federation of Engineering Organizations is engaged in promoting the transfer of knowhow among engineers of different countries. The coinciding concerns of UNIDO and WFEO have thus made it possible to take an additional step in the direction of environmentally concerned industrial development and the worldwide sharing of information sources of use to engineers, industrialists and society at large.

*Jean MICHEL*

*President of the Committee on Engineering Information  
World Federation of Engineering Organizations*

## AVANT-PROPOS

La Commission Information de l'ingénieur de la Fédération mondiale des organisations d'ingénieurs (FMOI) a contribué avec l'Organisation des Nations Unies pour le développement industriel (ONUDI) à la réalisation du présent guide répertoriant toutes les sources d'information utiles pour mieux résoudre les problèmes d'environnement.

Tout ingénieur, tout entrepreneur industriel, quel que soit son domaine d'activité, quelle que soit sa fonction, est, ou sera un jour, confronté à des problèmes d'environnement.

Pour mieux concevoir et mettre en œuvre les techniques certes les plus compétitives, mais surtout les moins agressives, à l'égard de l'environnement, l'ingénieur a besoin d'informations variées et spécifiques, propres à chaque situation, propres à l'organisme pour lequel il travaille et propres au pays concerné.

Une méthode s'imposait pour maîtriser cette information complexe et multidimensionnelle.

Le présent *Guide* en propose donc une, fondée sur l'analyse des besoins et des facteurs critiques à considérer en matière d'information sur l'environnement. Cette méthode introduit également des critères de choix des sources d'information.

La multiplicité de ces sources a conduit à procéder à un inventaire systématique pays par pays. C'est là que réside l'intérêt primordial du présent *Guide*, que toute entreprise, tout ingénieur devrait posséder et connaître.

La Fédération mondiale des organisations d'ingénieurs s'emploie à assurer le transfert des savoir-faire entre ingénieurs des divers pays. La rencontre des préoccupations mutuelles de l'ONUDI et de la FMOI permet de faire ainsi un pas de plus dans la direction d'un développement industriel respectueux de l'environnement et dans celle d'un partage mondial des ressources d'information utiles aux ingénieurs, aux industriels et à la société.

Jean MICHEL

Président

Commission Information de l'ingénieur  
Fédération mondiale des organisations d'ingénieurs.

# VORWORT

Der vorliegende Führer, in dem alle für Umweltprobleme relevanten Informationsquellen angeführt sind, wurde von der Kommission "Information des Ingenieurs" des Weltbundes von Ingenieursvereinigungen (WFEO) in Zusammenarbeit mit der Organisation der Vereinten Nationen für industrielle Entwicklung zusammengestellt und herausgegeben.

Jeder Ingenieur, jeder Unternehmer, wird früher oder später, und zwar gleichgültig, in welchem Bereich er tätig ist, mit Umweltproblemen konfrontiert

Der Ingenieur braucht deshalb zur Entwicklung und Anwendung der wettbewerbsfähigsten, jedenfalls jedoch der umweltfreundlichsten Techniken verschiedene, sehr konkrete Informationen, die der jeweiligen Situation, der Organisation, für die er arbeitet, und dem betreffenden Land Rechnung tragen.

Es mußte eine Methode gefunden werden, die es gestattet, sich in diesen komplexen und mehrdimensionellen Informationen zurechtzufinden. Der vorliegende Wegweiser schlägt eine sol-

che vor. Sie beruht auf einer Bedarfsanalyse und der genauen Erfassung aller kritischen Umweltfaktoren. Die Methode beinhaltet außerdem Auswahlkriterien zur Ermittlung der geeignetsten Informationsquellen.

Die Vielfalt der sich anbietender Informationsquellen hat die Autoren veranlaßt, eine systematische Bestandsaufnahme der in den einzelnen Ländern verfügbaren Informationsquellen vorzunehmen. Und dies macht den vorliegenden Führer, den jedes Unternehmen, jeder Ingenieur, besitzen sollte, so interessant.

Der Weltbund von Ingenieursvereinigungen sieht seine Aufgabe im Transfer von Know-how zwischen den Ingenieuren verschiedener Länder. Dank der ähnlichen Zielsetzungen von UNIDO und WFEO konnte nun ein weiterer Schritt in Richtung einer umweltfreundlichen industriellen Entwicklung und der weltweiten Öffnung von Informationsquellen, die für Ingenieure, Industrielle und die Gesellschaft von Bedeutung sind, getan werden.

*Jean MICHEL*  
*Präsident der*

*Kommission "Information des Ingenieurs"*  
*des Weltbundes von Ingenieursvereinigungen (WFEO)*



## PRÓLOGO

La Comisión "Información del Ingeniero", de la Federación Mundial de Organizaciones de Ingenieros (FMOI), ha colaborado con la Organización de las Naciones Unidas para el Desarrollo Industrial (ONUDI) en la realización de la presente *Guía*-repertorio de todas las fuentes de información útiles para mejor resolver los problemas del medio ambiente.

Todo ingeniero y todo empresario industrial, cualquiera que sea su esfera de actividad y la función que desempeñe, se enfrenta, o algún día se enfrentará, con problemas del medio ambiente.

Para mejor concebir y aplicar las técnicas más competitivas, pero sobre todo menos agresivas, desde el punto de vista del medio ambiente, el ingeniero necesita información variada y específica, apropiada a cada situación, al organismo para el cual trabaja y al país de que se trate.

Para poder dominar esta información compleja y multidimensional, es imprescindible seguir un método. En la presente *Guía* se propone uno

fundado en el análisis de las necesidades y de los factores críticos a tener en cuenta en materia de información sobre el medio ambiente. Este método ofrece asimismo criterios de elección de fuentes de información.

Ante la multiplicidad de esas fuentes, se ha procedido a realizar un inventario sistemático país por país. En ello reside, precisamente, el interés primordial de esta *Guía*, que toda empresa y todo ingeniero debieran poseer y conocer.

La Federación Mundial de Organizaciones de Ingenieros se ocupa de asegurar la transferencia de "know-how" entre ingenieros de diversos países. La coincidencia de las respectivas preocupaciones de la ONUDI y de la FMOI permite dar un paso más hacia el logro de un desarrollo industrial respetuoso con el medio ambiente y hacia la compartición, a nivel mundial, de recursos de información útiles para los ingenieros, los industriales y la sociedad.

*Jean MICHEL*

*Presidente de la Comisión "Información del Ingeniero"  
de la Federación Mundial de Organizaciones de Ingenieros*

# PREFACE

Environmental issues have become an inescapable element of technological and industrial decision-making. Even where legislation does not require it, environmental accountability is increasingly seen as supporting, rather than conflicting with the long-term business interests of industry. This awareness has led to a growing call for environmental information, as reflected in inquiries directed to UNIDO.

*Industry and Environment: A Guide to Sources of Information* is one means of meeting this demand. While UNIDO, itself, and the United Nations system as a whole, are major generators and repositories of environmental information, no one agency or group of institutions could hope to assemble the rapidly expanding body of relevant literature and data. The aim is therefore to provide the industrial and scientific communities, and others concerned with industry and the environment, with a signpost to sources of useful information.

The need to focus on environmental science and technology as a separate category of knowledge arises from the increasing difficulty of gaining an overview of the mass of information and sources, but also from their cross-sectoral and multidisciplinary nature. These special characteristics made it desirable to include a theoretical section on the nature and use of environmental information.

The chapters in question, which form the opening section of the book, resulted from cooperation with the World Federation of Engineering Organizations (WFEO), which has long been active in the field of environmental information. Likewise, UNIDO is indebted to WFEO for substantial additions both to the listings of sources in the *Guide*, and to UNIDO internal information resources.

This publication is, to some extent, a "spin-off" of the UNIDO Environment Programme, which necessitated the creation of the Referral Database on Energy and Environment (REED), from which

much of the material is drawn. It is also seen as a logical development in that it comes in the midst of preparations for the International Conference on Ecologically Sustainable Industrial Development, to be held at Copenhagen from 13 to 20 October, 1991, and the United Nations Conference on Environment and Development, to be held at Rio de Janeiro from 1 to 12 June, 1992.

This should not be taken as implying that information gathering and dissemination are peripheral to UNIDO activities. On the contrary, the encouragement of international transfers of information and known technological solutions is central to the mission of the Organization. The UNIDO Industrial and Technological Information Bank (INTIB), which plays an important part in this effort, was responsible for the sections of the *Guide* dealing with sources.

Beyond UNIDO, other parts of the United Nations system made significant contributions. Thanks are due, in particular, to the Paris office of the United Nations Environment Programme (UNEP), with which close cooperation is maintained, and to the UNEP worldwide information network, INFOTERRA. Likewise, the library at the Vienna International Centre provided valuable assistance, by allowing access to its database.

In a guide to information sources, it is obviously incumbent on the authors to clarify the nature and coverage of the sources, and the manner of their selection. In this connection, it should first be stressed that no claim is made to have listed all, or even necessarily the most relevant sources. This being to the best of the authors' knowledge the first such attempt to address the field of information on industry and the environment, its scope and ambition are necessarily limited.

The *Guide* essentially offers a selection of sources frequently used by colleagues at UNIDO, or generally acknowledged to be of primary importance in a given scientific field or industrial sector. The modest goal is to offer the reader in need of information on a specific problem a high prob-

ability of finding at least one source to which initial inquiries may profitably be directed.

This being said, the compilers believe that a useful start has been made towards listing sources of information regarding industrial pollution, environment-related research and development, equipment suppliers, technical services, consulting companies and institutions. These categories determine the basic structure of the *Guide*, but it is also indexed and organized according to industrial sectors, subsectors and countries.

The institutions are listed according to international, regional, national, research and commercial categories. It should be noted that, in order to limit the scope and size of the book, most academic institutions and government agencies unfortunately had to be omitted. In later editions, the compilers hope to make good this omission. With regard to those institutions that are included, the basis of selection was a willingness to answer inquiries on environmental matters from users of the *Guide*, as expressed in responses to a questionnaire circulated by UNIDO.

The final section contains a selection of companies active in the field and offering services on a commercial basis. No evaluation of these services was undertaken, and their inclusion implies neither an endorsement nor a recommendation.

The criterion for selection of databases was the availability of on-line searches, rather than content. None of the data sections of the book are to be regarded as in any way definitive, or even representative of the information available on given topics. For instance, owing to shortage of time, the section on publications had to be completed without profiting from bibliographies known to

exist. Nevertheless, it is hoped that the entries (numbering approximately 300) will prove to be of value. They include technical reports, handbooks, journals, bibliographies, proceedings and directories. Readers will see that in most cases abstracts have been supplied.

The data entries in the book come from the much larger REED database, which became fully operational in April 1991. REED is constantly updated and added to by a large in-house computer network, with focal points in all centres of operations at UNIDO headquarters. As the database grows, so is this publication to be regularly updated and expanded. The *Guide* will soon also be available on computer diskettes, in searchable database format. Other plans include the issue of hard copy in languages other than English.

In stressing the limitations of the *Guide*, the compilers have a positive purpose in mind. It is hoped that the response of readers will provide a vital impetus to its growth and improvement. Suggestions as to new sources, and evaluations of those already included, will therefore be gratefully received and wherever possible incorporated in future editions. To this end, a form for suggestions and comments by readers has been included on the last page of the *Guide*. Any responses, even if only an indication of names and addresses, would be greatly appreciated.

The *Guide* was compiled by Peter Pembleton of the Industrial and Technological Information Section, Industrial Technology Promotion Division, Department for Industrial Promotion, Consultations and technology of UNIDO.

# PRÉFACE

Il est désormais indispensable de tenir compte des questions de l'environnement lorsqu'on prend des décisions d'ordre technologique ou industriel. Que la législation impose ou non le respect de l'environnement, ou considère de plus en plus que, loin d'entrer en conflit avec les intérêts commerciaux à long terme de l'industrie, il les favorise. De ce fait, beaucoup souhaitent obtenir des renseignements sur l'environnement ainsi qu'en témoigne le nombre de requêtes que reçoit l'ONUDI à ce propos.

*L'industrie et l'environnement: un Guide sur les sources d'information* est l'un des moyens de répondre à cette demande. Si l'ONUDI elle-même, et en fait l'ensemble du système des Nations Unies, recueille et stocke une grande masse d'informations sur l'environnement, aucun organisme ou groupe d'institutions ne peut espérer rassembler toute la documentation et toutes les données pertinentes, qui s'accroissent de plus en plus. L'objectif de ce *Guide* est donc de fournir aux communautés industrielles et scientifiques et à tous ceux qui s'intéressent à l'industrie et à l'environnement un moyen de repérer des sources d'information utile.

La nécessité de considérer la science et la technologie de l'environnement comme une catégorie distincte de connaissance tient non seulement à la difficulté croissante d'obtenir une vue d'ensemble de toute l'information et de toutes les sources, mais aussi à leur nature intersectorielle et multidisciplinaire. Du fait de ces caractéristiques spéciales, il a paru souhaitable d'inclure une section théorique sur la nature et l'utilisation de l'information sur l'environnement.

Les chapitres en question, qui forment la première section du livre, résultent de la coopération établie avec la Fédération mondiale des organisations d'ingénieurs, qui oeuvre depuis longtemps dans le domaine de l'information relative à l'environnement. En outre, la Fédération a ajouté de nombreuses sources à celles qui sont énumérées dans le *Guide* et a complété les res-

sources d'information internes de l'ONUDI.

Cette publication est, dans une certaine mesure, une conséquence indirecte de la création du Programme de l'ONUDI relatif à l'environnement, qui a nécessité celle de la base de données de référence sur l'énergie et l'environnement (REED) d'où provient la plus grande partie de l'information. Il s'agit là d'une étape logique en ce sens que ce *Guide* a été établi pendant la préparation de la Conférence sur le développement industriel écologiquement durable qui doit avoir lieu à Copenhague du 13 au 20 octobre 1991, et de la Conférence des Nations Unies sur l'environnement et le développement, qui doit se tenir à Rio de Janeiro du 1er au 12 juin 1992.

Il ne faut pas interpréter cela comme signifiant que la collecte et la diffusion des renseignements constituent pour l'ONUDI des activités périphériques. Au contraire, l'encouragement des transferts internationaux d'information et de solutions technologiques connues est d'une importance capitale pour la réalisation des objectifs de l'Organisation. La Banque d'informations industrielles et technologiques (INTIB) joue un rôle important dans ces efforts, et ce sont donc les responsables de la Banque qui ont été chargés de rédiger les sections du *Guide* traitant des sources.

Outre l'ONUDI, d'autres éléments du système des Nations Unies ont apporté des contributions importantes au *Guide*. Il convient de remercier en particulier le Bureau de Paris du Programme des Nations Unies pour l'environnement (PNUE), avec lequel l'Organisation collabore étroitement, et le réseau mondial d'information du PNUE, INFOTERRA. La base de données de la bibliothèque desservant les organisations internationales au Centre international de Vienne est une autre source d'information précieuse.

Dans un guide indiquant les sources d'information, il est nécessaire de préciser la nature des sources et ce sur quoi elles portent, ainsi que le mode de sélection. A cet égard, il convient de souligner d'abord que les auteurs du *Guide* ne

prétendent nullement avoir énuméré toutes les sources ni même nécessairement les plus intéressantes. Ce *Guide* étant, autant qu'on puisse le savoir, le premier à être établi pour l'industrie et l'environnement, il est nécessairement limité dans sa portée et ses objectifs.

Il offre essentiellement une sélection de sources fréquemment utilisées par les experts et les fonctionnaires de l'ONUDI ou généralement reconnues comme étant de tout premier plan dans un domaine scientifique ou un secteur industriel donné. Il vise modestement à permettre à ceux qui ont besoin de renseignements sur un problème particulier de trouver au moins une source à laquelle ils puissent utilement adresser une première demande.

Cela étant, les auteurs du *Guide* estiment que celui-ci constitue un bon commencement en ce qui concerne l'énumération des sources d'information sur la pollution industrielle, la R-D liée à l'environnement, les fournisseurs de matériel, les services techniques, les sociétés de consultants et les institutions. Cet ouvrage est fondamentalement conçu en fonction de ces catégories mais il est aussi indexé et organisé par secteurs industriels, sous-secteurs et pays.

Les institutions sont classées de la manière suivante: institutions internationales, régionales, nationales, de recherche et commerciales. Les auteurs ont dû se résoudre à omettre la plupart des établissements d'enseignement supérieur et des organismes gouvernementaux, sinon le *Guide* eût été de trop vaste portée et trop volumineux. Dans les éditions ultérieures, les auteurs espèrent réparer cette omission. En ce qui concerne les institutions qui sont incluses, le critère de sélection a été le fait qu'elles ont déclaré, dans leur réponse à un questionnaire distribué par l'ONUDI, être prêtes à répondre aux questions des utilisateurs du *Guide* sur des questions d'environnement.

La section finale indique un certain nombre de sociétés travaillant dans ce domaine et offrant des services sur une base commerciale. Il n'a pas été procédé à une évaluation de ces services et leur inclusion ne signifie pas qu'on approuve leurs services ni qu'on les recommande.

Le critère de sélection des bases de données a été

la possibilité d'effectuer des recherches en direct plutôt que le contenu de ces bases. Les sections de données de cet ouvrage ne sont pas établies de manière définitive; elles ne donnent même pas une idée exacte des renseignements disponibles sur des sujets donnés. C'est ainsi que, faute de place, la section sur les publications a dû être terminée sans que l'on puisse utiliser les bibliographies connues. Néanmoins, on espère que les entrées (qui sont au nombre de 300 environ) se révéleront intéressantes. Elles comprennent les rapports techniques, des manuels, des revues scientifiques, des bibliographies, des comptes rendus de débats et des annuaires. Dans la plupart des cas, des résumés ont été fournis.

Les entrées de données dans ce volume proviennent de la base de données REED, qui est beaucoup plus importante et est devenue tout à fait opérationnelle en avril 1991. Cette base de données est constamment mise à jour et élargie par un vaste réseau informatisé relié à tous les centres opérationnels de l'ONUDI. Au fur et à mesure que la base de données s'élargira, cette publication sera mise à jour et élargie. Ce *Guide* sera aussi bientôt disponible sur disquettes sous forme de base de données. On prévoit aussi de le publier dans des langues autres que l'anglais.

En soulignant les limites du *Guide*, ses auteurs ont un objectif positif en vue. Ils espèrent que la réponse à cette étude lui imprimera un élan vital qui lui permettra de se développer et de s'améliorer. Les suggestions concernant de nouvelles sources et l'évaluation de celles qui sont déjà incluses seront donc reçues avec reconnaissance et seront incorporées dans les éditions futures, chaque fois que cela sera possible. A cette fin, on a inclus à la dernière page du *Guide* un formulaire pour les suggestions et les commentaires. Toute réponse, même si elle consiste seulement en l'indication de noms et d'adresses, sera la bienvenue.

Le *Guide* a été compilé par Peter Pembleton de la Section d'Informations Industrielles et Technologiques, Division de la Promotion Technologique, Département de la Promotion Industrielle, Consultations et Technologie de l'ONUDI.

## ZUM GELEIT

Umweltüberlegungen haben heutzutage ihren festen Platz in allen technischen und industriellen Entscheidungsprozessen. Selbst in Bereichen, wo es das Gesetz nicht ausdrücklich verlangt, wird umweltbewußtes Vorgehen längst nicht mehr als Behinderung der langfristigen Wirtschaftsinteressen der Industrie, sondern als diesen durchaus förderlich angesehen. Dieses Umdenken hat zu einem steigenden Bedarf an Umweltinformationen geführt, wie sich an den Anfragen bei der UNIDO zeigt.

*Industrie und Umwelt: Ein Wegweiser zu Informationsquellen* ist eines der Mittel, um diesem Bedarf zu entsprechen. Bei der UNIDO, ja im gesamten System der Vereinten Nationen, werden zwar in großem Maßstab Informationen produziert und gesammelt, doch ist keine einzelne Organisation oder Gruppe von Institutionen für sich allein imstande, die immer größer werdenden Mengen einschlägiger Literatur und Daten zusammenzutragen und zu überblicken. Ziel dieses *Wegweisers* ist es daher, Industrie und Wissenschaft sowie allen anderen, die mit Industrie und Umwelt zu tun haben, ein Instrument zur Auffindung von Quellen nützlicher Informationen in die Hand zu geben.

Die Notwendigkeit, sich mit der Umweltwissenschaft und -technologie als einem eigenen Wissensbereich auseinanderzusetzen, ergibt sich nicht nur aus der Schwierigkeit, den Überblick über die riesigen Mengen von Informationen und Quellen zu behalten, sondern auch aus ihrer sektoren- und fachbereichübergreifenden Natur. Deshalb schien es angezeigt, den *Wegweiser* durch einen theoretischen Teil über Art und Verwendung von Umweltinformationen zu ergänzen.

Die betreffenden Kapitel, die den ersten Abschnitt des vorliegenden Bandes bilden, wurden in Zusammenarbeit mit dem Weltbund von Ingenieursvereinigungen (WFEO) zusammengestellt, der seit langem auf dem Gebiet der Umweltinformation tätig ist. Maßgebliche Ergänzungen in der Liste der Informationsquel-

len, aber auch im internen Informationsbestand der UNIDO, sind ebenfalls dem WFEO zu verdanken.

Diese Veröffentlichung ist in gewisser Weise ein Nebenprodukt des Umweltprogramms der UNIDO, das zur Schaffung der *Referral Database on Energy and Environment* (REED) führte, aus dem der Großteil des hier verarbeiteten Material stammt. Sie ist insofern eine logische Entwicklung, als sie zu einer Zeit erfolgt, in der die Internationale Konferenz über umweltfreundliche industrielle Entwicklung (13. bis 20. Oktober 1991, Kopenhagen) und die Konferenz der Vereinten Nationen über Umwelt und Entwicklung (1. bis 12. Juni 1992, Rio de Janeiro) vorbereitet werden.

Das bedeutet jedoch nicht, daß Informationserfassung und -verbreitung nebensächliche Aspekte der UNIDO-Aktivitäten sind. Die Förderung des internationalen Transfers von Informationen und bekannter technischer Problemlösungen ist einer der Schwerpunkte unter den Zielsetzungen der Organisation. Die *Industrial and Technological Information Bank* (INTIB) der UNIDO, die im Rahmen dieser Bemühungen eine wichtige Rolle spielt, lieferte die Daten für die Kapitel über die Informationsquellen.

Neben der UNIDO haben weitere Mitglieder der Familie der Vereinten Nationen bedeutende Beiträge zum *Wegweiser* geliefert. Besonderer Dank gilt dem Pariser Büro des Umweltprogramms der Vereinten Nationen (UNEP), mit dem eine enge Zusammenarbeit besteht, sowie dem weltweiten UNEP-Informationsnetz INFOTERRA. Als weitere Quelle wertvoller Informationen erwies sich die Datenbank der Bibliothek des Internationalen Zentrums Wien.

In einem *Wegweiser* zu Informationsquellen muß die Art einer Quelle und das von ihr abgedeckte Wissensgebiet ebenso beschrieben werden wie die Vorgehensweise zur Auswahl der geeignetsten Quellen. Vorweg sei betont, daß das vorliegende Werk nicht den Anspruch erhebt, alle oder

auch nur die wichtigsten Informationsquellen anzuführen. Es handelt sich hier um den ersten bekannten Versuch, den Informationsbereich "Industrie und Umwelt" zu erfassen, wodurch sich zwangsläufig gewisse Beschränkungen hinsichtlich des Geltungsbereichs und des Anspruchs auf Vollständigkeit ergeben.

Der *Wegweiser* bietet im wesentlichen eine Auswahl an Quellen, die oft von UNIDO-Experten und -Mitarbeitern genutzt werden, oder von denen allgemein bekannt ist, daß sie für ein bestimmtes Fachgebiet oder einen bestimmten Industriezweig von erster Bedeutung sind. Mit dem *Wegweiser* soll einfach denjenigen, die Informationen zu einem konkreten Problem benötigen, dazu verholfen werden, daß sie mit hoher Wahrscheinlichkeit zumindest eine erfolversprechende Quelle finden, an die sie eine erste Anfrage richten können.

Nach diesen Vorbemerkungen sei festgestellt, daß die Autoren des *Wegweisers* diesen Band als einen nützlichen ersten Schritt ansehen, Informationsquellen über die Belastung der Umwelt durch die Industrie, umweltbezogene Forschung und Entwicklung, Lieferanten von Ausrüstungsgegenständen, technische Dienste sowie Beratungsfirmen und -einrichtungen aufzulisten. Nach diesen Kategorien wurde der *Wegweiser* gegliedert, er wurde jedoch auch nach Industriesektoren, -untersektoren sowie nach Ländern indexiert.

Die Institutionen sind ebenfalls in einzelne Kategorien eingeteilt: international, regional, national, Forschung, kommerziell. Bedauerlicherweise mußte auf die Nennung der meisten akademischen Institutionen und Regierungsstellen verzichtet werden, da der Band sonst zu umfangreich geworden wäre. Die Autoren hoffen, dieses Manko in späteren Auflagen wettmachen zu können. Was die angeführten Institutionen betrifft, so wurden sie nach ihrer Bereitschaft ausgewählt, Anfragen über Umweltfragen seitens der Benutzer des *Wegweisers* zu beantworten, wobei diese Bereitschaft anhand eines durch die UNIDO verschickten Fragebogens ermittelt wurde.

Im letzten Abschnitt sind Firmen angeführt, die in diesem Bereich tätig sind und Informationen auf kommerzieller Basis liefern. Die Qualität ihrer

Dienstleistungen wurde nicht überprüft und ihre Nennung bedeutet weder eine Unterstützung noch eine Empfehlung.

Maßgebend für die Auswahl von Datenbanken war die Möglichkeit von On-line Abfragen und nicht unbedingt ihr Inhalt. Keiner der Buchabschnitte über Daten ist endgültig oder auch nur repräsentativ für die zum betreffenden Thema verfügbaren Informationen. So konnten etwa bei der Zusammenstellung des Teiles über Veröffentlichungen bekannte Bibliographien aus Zeitgründen nicht konsultiert werden. Trotzdem ist zu hoffen, daß die (rund 300) Einträge sich als nützlich erweisen. Unter ihnen finden sich technische Berichte, Handbücher, Zeitschriften, Bibliographien, Protokolle und Adreßbücher.

Die Dateneinträge stammen aus der viel größeren Datenbank REED, die im April 1991 ihre Arbeit aufnahm. REED wird durch ein UNIDO-internes umfassendes Computer-Netzwerk laufend aktualisiert und erweitert, das über Eingabe-/Ausgabestellen in allen Operationszentren am Sitz der UNIDO verfügt. In dem Maße, als die Datenbank an Umfang zunimmt, wird auch diese Veröffentlichung regelmäßig aktualisiert und ergänzt. Der vorliegende *Wegweiser* wird in Kürze auch auf Computer-Disketten in abfragbarem Datenbankformat verfügbar sein. Ferner sind Fremdsprachenausgaben geplant.

Die Autoren haben auf die Beschränkungen des *Wegweisers* nicht ohne Hintergedanken hingewiesen. Sie hoffen, daß die Reaktionen auf diese Studie zu deren Wachstum und Verbesserung beitragen werden. Hinweise auf neue Quellen und Beurteilungen der bereits aufgenommenen werden daher dankbar entgegengenommen und wo immer möglich in zukünftigen Ausgaben ihren Niederschlag finden. Zu diesem Zweck findet sich auf der letzten Seite des *Wegweisers* ein Formular für Anregungen und Kommentare. Jede Reaktion, sei es auch nur die Angabe von Namen und Anschriften, ist willkommen.

Dieser *Wegweiser* wurde von Peter Pembleton von der Abteilung für Industrielle und Technologische Information, Division zur Förderung Industrieller Technologie, Fachabteilung zur Industrieller Förderung, Beratung und Technologie in der UNIDO zusammengestellt.

## PREFACIO

Las cuestiones ambientales se han convertido en un elemento ineludible de la adopción de decisiones de carácter tecnológico e industrial. Aun cuando la legislación no lo exija, se está considerando cada vez más que la responsabilidad con respecto al medio ambiente, en lugar de ir en contra de los intereses comerciales a largo plazo de la industria, favorece dichos intereses. Este convencimiento ha determinado una creciente demanda de información medioambiental, como lo demuestra el número de consultas hechas a la ONUDI.

*Industria y Medio Ambiente: Guía de Fuentes de Información* es un medio de satisfacer esa demanda. Aunque la propia ONUDI, y de hecho el sistema de las Naciones Unidas en su conjunto, sea una importante generadora y depositaria de información medioambiental, ningún organismo o grupo de instituciones podría esperar reunir el volumen, en rápido aumento, de publicaciones y datos pertinentes. La finalidad de esta *Guía* es, por tanto, proporcionar a las comunidades, industriales y científicas, y a otras entidades o personas interesadas por la industria y el medio ambiente, un medio de localizar fuentes de información útil.

La necesidad de centrarse en la ciencia y en la tecnología del medio ambiente como categoría de conocimiento independiente surge no sólo de la dificultad, cada vez mayor, de tener una visión de conjunto del cúmulo de información y fuentes disponibles, sino también de su carácter intersectorial y multidisciplinario. Estas características especiales han hecho que se considerara conveniente incluir una sección teórica sobre la naturaleza y el empleo de la información medioambiental.

Los capítulos en cuestión, que constituyen la sección introductoria del libro, son resultado de la cooperación con la Federación Mundial de Organizaciones de Ingenieros (FMOI), que desde hace largo tiempo viene participando activamente en el campo de la información medioambiental.

La ONUDI también está en deuda con la FMOI por sus considerables aportaciones tanto a las listas de fuentes de información de la *Guía* como a los recursos internos de información de la ONUDI.

Esta publicación es, hasta cierto punto, un subproducto del Programa de la ONUDI para el Medio Ambiente, que ha hecho necesaria la creación de la Base de Datos de Referencia sobre Energía y Medio Ambiente (REED), de la que se ha obtenido gran parte de los datos presentados. La publicación es un desarrollo lógico por cuanto llega en mitad de los preparativos de la Conferencia Internacional sobre un Desarrollo Industrial Ecológicamente Sostenible, que se celebrará en Copenhague del 13 al 20 de octubre de 1991, y de la Conferencia de las Naciones Unidas sobre Medio Ambiente y Desarrollo, que tendrá lugar en Río de Janeiro del 1º al 12 de junio de 1992.

Esto no significa que la recogida y difusión de información sean aspectos poco importantes de las actividades de la ONUDI. Todo lo contrario: el estímulo a la transmisión internacional de información y de soluciones tecnológicas conocidas es de capital importancia para el logro de los objetivos de la Organización. El Banco de Información Industrial y Tecnológica de la ONUDI (INTIB), que desempeña un papel importante en este esfuerzo, se ocupó de las secciones de la *Guía* que tratan de las fuentes de información.

Además de la aportación de la ONUDI, la *Guía* se ha beneficiado de considerables aportaciones procedentes de otras partes del sistema de las Naciones Unidas. Hemos de dar las gracias, en particular, a la oficina que tiene en París el Programa de las Naciones Unidas para el Medio Ambiente (PNUMA), con la que se mantiene una estrecha colaboración, así como a INFOTERRA (Red mundial de información del PNUMA). Otra fuente de valiosa información ha sido la biblioteca que atiende a las organizaciones internacionales del Centro Internacional de Viena.



En una guía de fuentes de información, es necesario aclarar la naturaleza y la cobertura de las fuentes, así como la forma en que éstas se han seleccionado. A este respecto, convendría subrayar en primer lugar que no se ha pretendido incluir todas las fuentes, y las que lo están no son necesariamente las más importantes. Como el primer intento conocido de abarcar el sector de información sobre la industria y el medio ambiente, el alcance y la ambición de la *Guía* son inevitablemente limitados.

La *Guía* ofrece, en esencia, una selección de fuentes frecuentemente utilizadas por funcionarios y expertos de la ONUDI, o generalmente reconocidas como de importancia primordial en un determinado campo científico o sector industrial. La modesta meta que se ha fijado es ofrecer, a quienes necesiten información sobre un problema específico, grandes probabilidades de encontrar por lo menos una fuente a la que puedan hacer útilmente consultas iniciales.

Dicho esto, los compiladores de la *Guía* consideran que representa un buen principio hacia la catalogación de fuentes de información sobre contaminación industrial, instituciones y empresas consultoras, servicios técnicos, proveedores de equipo e investigación y desarrollo relacionados con el medio ambiente. Estas categorías determinan la estructura básica de la *Guía*, pero ésta también está indizada y organizada por sectores y subsectores industriales, así como por países.

Las instituciones figuran por categorías: internacionales, regionales, nacionales, de investigación y comerciales. A fin de limitar el alcance y el tamaño del libro, han tenido que omitirse, lamentablemente, la mayoría de las instituciones académicas y de los organismos gubernamentales. Los compiladores esperan subsanar estas omisiones en ediciones posteriores. Con respecto a las instituciones que se han incluido, su selección estuvo presidida por el deseo de atender consultas sobre cuestiones ambientales hechas por los usuarios de la *Guía*, a la vista de las respuestas a un cuestionario que distribuyó la ONUDI.

La sección final contiene una selección de empresas que participan activamente en esta esfera y ofrecen servicios de carácter comercial. Tales servicios no han sido evaluados, y su inclusión no significa que se

aprueben o recomienden.

Para la selección de las bases de datos, se ha seguido el criterio de la disponibilidad de búsquedas en línea, y no el criterio del contenido. Ninguna de las secciones de datos del libro es definitiva, y ni siquiera representativa de la información disponible sobre determinados temas. Por ejemplo, por falta de tiempo, la sección dedicada a las publicaciones tuvo que prepararse sin aprovechar bibliografías que se sabe que existen. No obstante, es de esperar que las entradas (aproximadamente 300) resulten útiles. Tales entradas se refieren a informes técnicos, manuales, revistas, bibliografías, actas, guías de direcciones y directorios. En la mayoría de los casos, se han facilitado extractos.

En el libro, las entradas de datos proceden de una base de datos mucho más amplia (REED), que empezó a funcionar normalmente en abril de 1991. La REED se está actualizando y ampliando constantemente por medio de una importante red de computadoras interna, que cuenta con coordinadores en todos los centros de operaciones de la Sede de la ONUDI. A medida que la base de datos vaya aumentando, esta publicación se actualizará y ampliará periódicamente. La *Guía* estará pronto disponible en disquetes de computadora, en formato de base de datos investigable. También se proyecta publicarla en otros idiomas.

Los compiladores subrayan las limitaciones de la *Guía* con una finalidad positiva. Es de esperar que la respuesta a este estudio constituya un incentivo de importancia esencial para su ampliación y mejora. Por tanto, toda sugerencia respecto a nuevas fuentes, y toda evaluación de las fuentes ya incluidas, serán bienvenidas y, siempre que sea posible, se tendrán en cuenta en futuras ediciones. A tal fin, en la última página de la *Guía* figura un formulario en el que pueden hacerse sugerencias y observaciones. Toda respuesta, aun cuando sólo se trate de una indicación de nombres y direcciones, será especialmente agradecida.

Esta *Guía* fue compilada por Peter Pembleton de la Sección de Información Industrial y Tecnológica, División de Promoción de Tecnología Industrial, Departamento de Promoción Industrial, Consultas y Tecnología de ONUDI.

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## INTRODUCTION

Every engineer and every person involved in industrial development, whatever his field of activity and whatever his function, is confronted by environmental problems, or will be one day.

What are the appropriate techniques for combating any particular type of pollution? What will be the environmental consequences of applying a particular new technology? What processes make it possible to improve the internal environment of production plants? What are the environmental criteria to be taken into account in the design of a product or in the construction of an industrial plant, building or dam? What are the effluent criteria to be imposed on an industrial plant? What is the short- and long-term damage that can be caused by the feedstocks used in production and manufacturing processes? How can their use be minimized (savings in water, energy, raw materials, etc.)? How can the toxic wastes produced be managed (taking into account the useful operating or useful life of products and of those that have become obsolete)?

What is the possible cost of, or profit to be achieved by any particular environmental protection measure, vis-à-vis competitors?

These examples illustrate the diversity of the concerns that may confront engineers in their work. To some, they will be exceptional, to others, they will be routine.

In all cases, the problems will be very specific and will require varied information that is also specific and peculiar to each case, to the organization and to the country faced with the problems.

Moreover, the relations between an industrial activity and its effects on the environment as well as on society are complex. Consequently, how should a particular case be analysed? How should the sectors to which it is related be determined? What information should be chosen?

A method is necessary in order to guide the search for information appropriate to the particular problem for the following reasons:

- The analysis of each case is a complex process. It is therefore necessary to consider what factors should be taken into consideration and how they should be evaluated;
- The contours of the "environmental" field are indistinct. It is an interdisciplinary concept and can overlap with all sectors of knowledge and activity. But in that case, which sectors should be chosen? According to what criteria? How?
- Environmental protection is of interest to all countries and affects all activities. It follows that there are numerous information mechanisms and agencies that supply information throughout the world. How can they be identified, where should they be sought, and how should they be selected in order to obtain the information desired?
- Progress in information technology makes it possible to create and develop ways and means of access to a diversified mass of information. How can these tools be identified and how can they be chosen according to the information sought?
- The field environment is so vast that the explosion in and the proliferation of information lead either to under-information or to a glut of information, unless a method is followed to guide choice.

This *Guide* is divided into two parts and is intended to help in a search for information in the following ways:

- (a) By helping to define and analyse a particular case, the conditions in which a problem arises and the objectives that determine the need for information<sup>1</sup> (Part I, Chapter 1);
- (b) By suggesting a method for specifying and seeking useful information (Part I, Chapter 2);
- (c) By suggesting a list of information media or suppliers that could be consulted (Part II).

<sup>1</sup> Engineers specializing in the environment usually have a general picture of the problem that they have to solve, know whether relevant information exists and where to find it. In this case, the manual will act as a guide in seeking additional information required. Such persons need not follow the entire method.

# **PART I**

## **THE METHOD**

**How to obtain information on the environmental  
implications of an industrial process**

# CHAPTER 1

## ANALYSIS OF THE PROBLEM TO BE SOLVED — prior to the information search

### THE DIAGNOSTIC PRINCIPLE

Obtaining information means first of all diagnosing and analysing the problem to be solved.

To obtain environment information on a particular activity, it is essential that the activity be defined and evaluated before the search procedure is started.

The search method for environmental information is based on the precise identification of targets:

- What is the aim of the activity—information for what purpose?
- What is the organization concerned?
- What are the precise circumstances in which the problem of pollution or environmental protection arises?
- What are the consequences of this problem?
- What are the special conditions governing the use of the information sought. Who is involved?

It should be emphasized that someone seeking information on the environment is usually working in a team, whatever the organization to which he belongs; and the search that he undertakes is also a collective activity. The method proposed, based on analysis of the action for which information is to be sought, is applicable both by an individual working on his own and by a team.

It should also be made clear that this *Guide* is addressed both to specialists and laymen in the environmental field, as well as to information specialists.

Environmental specialists who are confronted daily with problems of impact, effects on technologies or the applications of industrial processes, the management of products or effluents, training, etc. will use it to confirm or supplement information already available to them.

Laymen, i.e. those who are occasionally con-

fronted with an environmental problem in drafting a report on a product or a technology, a feasibility study, a factory establishment project, or with the application of regulations, etc. will use the guide to find, organize and apply the information they need.

Information specialists will use it to reply to requests for information from those confronted with environmental problems. The *Guide* enables a precise analysis of each case to be made, describing the methodology and facilitating the identification of further data needed on the case in question.

The *Guide* is an instrument for dialogue between the demand and supply sides; it helps to avoid errors of interpretation, reduce time wastage and increase confidence in the information provided. In other terms, it allows the best quality/price ratio to be obtained.

It should be emphasized that this *Guide* will also help to ensure optimum operational activities:

- The precise diagnosis of the action to be taken and its objectives and consequences, following the proposed procedure, determines the success of the action;
- The availability of reliable information on the action to be taken, at the lowest cost, reduces the risk of error and time-wasting, and maximizes the use of available resources and minimizes the amount of time spent on the exercise.

The result is a reduction of the costs of the action to be taken and, consequently, economies for the implementing organization.

The diagnosis of the problem to be solved consists in defining (figure 1):

- (1) The action envisaged. The stage of progress achieved—what is the current position? The purpose—what is the task involved?;
- (2) The nature of the organization concerned,

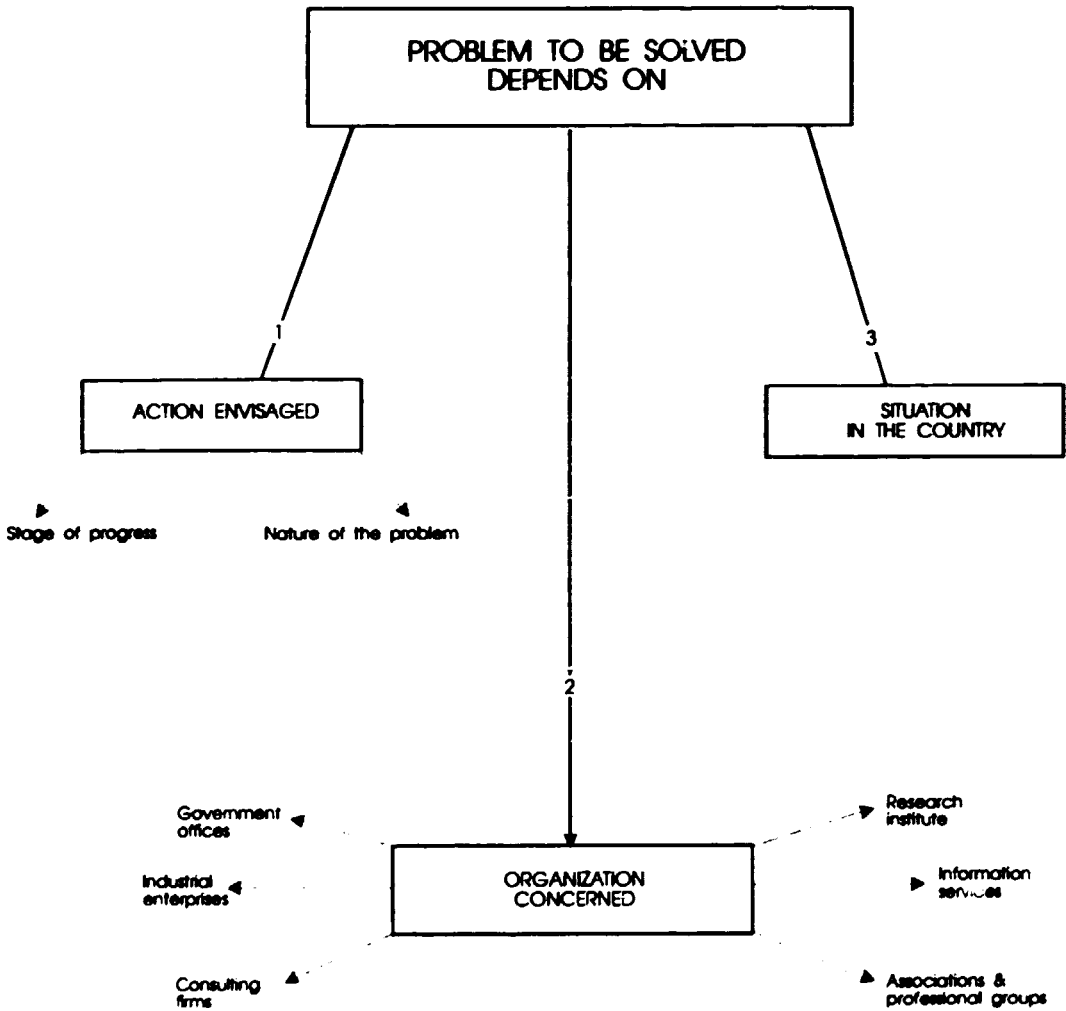


Figure 1 Elements of the diagnosis

distinguishing, because their objectives are different, between enterprises, consultancy bureaux, government offices, research institutes, teaching establishments and information establishments;

(3) The country situation. In order to facilitate the diagnosis of a particular situation, typical cases are presented. It is also explained in what respect and for what reason information needs differ according to the organizations involved (whose objectives are not identical).

Similarly, the differences in information needs between one country and another, in the case of identical activities, that are caused by the diversity of environmental protection policy is indicated.

The characteristic data on a given activity or a problem to be solved are elicited by taking the following as a guide and are used in the search method that is proposed in Chapter 2.

## 1. WHAT IS THE ACTION ENVISAGED?

To define the action envisaged or the problem to be solved, two questions should be answered: What is the current state of progress and what is the task involved? (Figure 2)

### 1.1 WHAT IS THE CURRENT STAGE OF PROGRESS?

A logical approach is necessary in any action. It consists of studying the feasibility of action, implementation and making the results known.

Five stages of the process therefore need to be considered, which require different information regarding the action envisaged, as well as, possibly, different information mechanisms. These stages are:

- Analysis;
- Decision (review of the current situation and future aspects, evaluation of risks, the economic context, etc.);
- Innovation and design;
- Implementation (development, manufacture, etc.);
- Dissemination of information (in writing or by word of mouth).

### 1.2 WHAT ARE THE TASKS AT HAND?

Those who are confronted with environmental problems can be directly or indirectly involved in

one or more of the following typical operations:

- Regulating human activities and their impact on the environment;
- Management of the environment – legislation, monitoring, establishing standards, establishing or supplementing monitoring data;
- Averting one or more problems with a qualitative or quantitative impact on a natural resource and, for that purpose, understanding the process of development in natural environments;
- Achieving economic optimization while reducing pollution and complying with regulations;
- Developing a new product, a new process, a market;
- Providing information on the relationships between human activity and the environment;
- Training staff with regard to environmental problems linked to industrial activities and to development in general (including agricultural and urban development).

Those are normal environmental protection activities.

However, they differ in their objectives, and, as a result, in the information that is needed (see figure 2).

#### (a) *Regulating activities and their impact*

Government offices are responsible for establishing regulations, which in turn affect the activities of operators both in industry and in local, urban or rural communities.

When public awareness of a specific environmental problem (accidental pollution, deterioration of the countryside or the quality of life, etc.) has been aroused, these regulations are relied upon as a basis for action to ensure that they are complied with and implemented and that environmental aspects are taken into account.

As a result, several types of data are needed:

- Numerical data (statistics, series or isolated data, compilations, etc.);
- Standards, regulations and draft regulations, analyses, etc. for the preparation of updated reports on a particular state of the environment, the nature of the problems thus revealed, related dynamic aspects and ways in which the

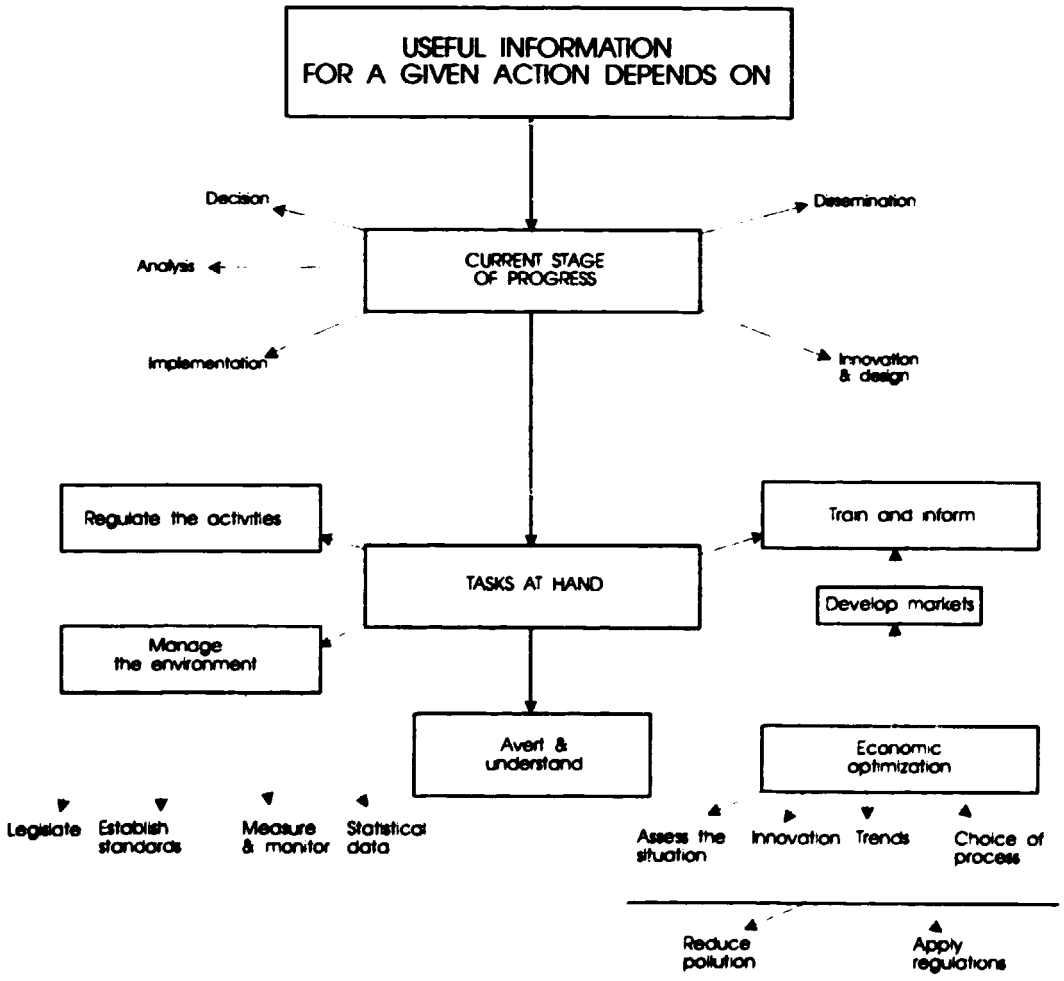


Figure 2 Characteristics of action envisageu

latter might conceivably be controlled or reoriented.

#### *(b) Management of the environment*

Management of the environment is both an economic and a political concern. The authorities of a country assume the duty of conserving the national heritage (in both the quantitative and qualitative aspects), particularly by the rational and co-ordinated use of land.

The economic future of a country depends on the rational use of its natural resources.

Generally speaking, those engaged in activities directly linked to the protection and rehabilitation of the environment need information in order to:

- Ascertain the toxicity of the raw materials used and of the products manufactured;
- Reduce the volume of wastes and effluents or alter their nature;
- Limit or eliminate their impact on the environment;
- Protect natural environments by developing and applying regulations (waste management, town planning, etc.);
- Improve the quality of life by the control of nuisance factors;
- Carry out measurements in order to monitor pollutants.

More precisely, environmental management comprises four types of mutually complementary action:

#### *Legislation*

High-quality information is of paramount importance both for governments responsible for legislative and regulatory action and for enterprises that have to apply the laws. Such information may be related to:

- Permissible rates of pollution, standards for effluents and emissions, etc.;
- The nature and quantity of pollutants produced by industrial, agricultural and urban activity, etc.;
- The possibility of influencing pollution flows in their own and other countries;
- The protection of fragile natural environments and of the countryside, in view of the

pressure to which they are subjected (intensive agriculture, tourism, infrastructural development, etc.).

#### *Establishing standards*

Standards and regulations are the means by which the public authorities and industry respond to problems linked to environmental protection. They are specific to each country and are elaborated by analysing the risks to which the population and the environment are exposed, compared to the consequences of the prevention of these risks on the situation and development of industry.

To be specific, the information sought involves:

- Prior knowledge of the standards enforced in other countries or recognized by international organizations;
- The scientific, technological and social data on which these standards are based;
- Data on local conditions that make it possible, if appropriate, to adapt external standards to special local conditions.

#### *Measurement and monitoring*

To prepare and set up measurement installations and to monitor the results, information is required on:

- Methods for measuring and monitoring pollution in and around plants;
- The permissible levels of pollutant products in effluents and emissions, both inside and outside plants;
- Technologies to be applied to reduce pollution.

#### *Establishing or supplementing numerical data for monitoring the environment*

Government offices need to collect data concerning the environmental effects of existing and projected industrial activities, of urban growth and the rural exodus, of intensive agricultural practices, etc.

For that purpose, studies and data compiled on the impact of products and processes and on the causes and consequences of choices made or likely to be made are required. The services of consultants and international or-



ganizations, to draw up basic reports on the current situation in the countries (or regions).

*(c) Averting and understanding problems linked to the quality of the environment*

When the industrial activity is likely to affect the environment, there is an increasing need for information upstream of the process of design, study and manufacture of a product or implementation of a process.

The need for information is then part of an overall study process that includes the product and the technology, from the design stage (and therefore from market demand) to its foreseeable impact on the environment (from the cradle to the grave).

This process favours invention and innovation. The economic profitability of a product can be increased by eliminating, modifying or reusing certain components (recycling).

This objective also calls for research – and a legislative framework that makes it possible to conduct such research before authorization of the manufacture and distribution of products – on the nature and volume of the elements used in the processes and on the long-term or residual effects of their toxicity on man and the environment.

It is easier to solve a pollution problem that has a single source, which is therefore precisely localized (this is even easier if the problem is dealt with before the establishment and start-up of the industrial plant), than to monitor pollutants with a multiple source and little known or imperfectly known transfer modes. Information needs on this subject are felt both by the authorities and by enterprises or consultancy bureaux.

Similarly, the problems of the transport or transfer of hazardous products go beyond the framework of a single enterprise and are a matter for government policy on management and prevention.

*(d) Economic optimization*

This is the essential objective of industrial activity. As a result, it is bound to be connected with the concerns of industry for environmental protec-

tion, so that information on both industry and the environment is called for.

Generally speaking, in the search for optimum profitability, information is needed for the following purposes:

- Assessing the situation – evaluating impacts and production costs;
- Innovation – modifying or improving a manufacturing process and constructing new installations;
- Identifying trends – evaluating the consequences of an existing situation, identifying possibilities of improvement in order to develop processes that perform better and pollute less, impact of the development of standards regarding existing processes and the products used;
- Choosing a process – cost of installation, possible savings and gains in future markets.

More precisely, environmental protection implies one or more of the following types of action.

*Reducing pollution*

The application of methods for the reduction of effluents, wastes, etc. can in the long run bring production gains through energy and raw material savings. Production management then becomes more efficient.

Recycling and waste control increase the number of markets, improve productivity and reduce the investments necessary for monitoring and purifying effluents downstream of the process.

In many cases, the use of non-polluting techniques (cleaner production processes) has proved advantageous both to the public and to industry.

For this purpose, enterprises seek information on processes, technologies, materials or equipment in order to influence both the upstream and downstream sides of their production activities.

*Applying regulations*

Environmental standards which may be required by existing specifications and regulations are:

- Constraints and may have the force of law and can then be imposed, in the present or the near future. They must be known so that they can be observed;
- Sources of information for anyone who wishes

to know the acceptable limits for a particular effluent or waste, as well as its impacts and risks.

However, they are not in themselves limitations.

Every industrialist, every local official and every territorial authority needs information on:

- The costs of adaptation to a standard;
- Methods for carrying out this adaptation at the lowest cost or even at a profit.

The employment of industrial technologies and processes that obey environmental protection principles (savings in the use of resources and energy, reduction in pollution, recycling) enables enterprises to be more economical and more profitable.

These technologies and processes give rise to demand for information on the part of the enterprises that apply them, for, to be precise, such enterprises need:

- Information on new technologies;
- Information on the rates of pollutant effluents and wastes associated with available processes;
- Information on the recovery and recycling of wastes during manufacture and at the final stage.

*(e) Developing new markets for new products or processes*

Innovation can produce substantial commercial returns, whether it is related to processes that are not harmful to the environment, equipment, measurement, monitoring or the reduction of pollution.

In view of the growth and increasing complexity of environmental problems, industry feels the need to invent or adopt technical solutions that are acceptable both ecologically and economically, regarding, for example, the production and management of toxic wastes, as well as the prevention of industrial accidents (evaluation of risks).

The information to be sought is related specifically to:

Markets;

Patents;

"Clean" processes and technologies.

This activity is linked to forward-looking studies and to medium- and long-term market analyses.

*(f) The dissemination of knowledge, training or information*

The exchange and dissemination of information are based on:

- The demand for information (more or less clearly formulated);
- The supply of information (by a service, a person or an organization);
- The transfer of information that is made available between the body that demands information and the body that supplies it.

## 2. WHAT IS THE ORGANIZATION IN QUESTION?

The action that we have just described concerns enterprises, government offices and research institutes as well as teaching or information establishments. Since these various organizations differ in their aims, they also differ in the manner and circumstances of their environmental protection concerns and approaches.

The problem is therefore approached by analysing the place occupied by the environment in the objectives of the body for which the action is carried out or that is faced by a particular problem.

These factors influence the need for information, that is to say, the nature of the information that is useful in the case in point as well as the conditions for collecting and processing it (these conditions are dealt with in Chapter 2).

To assist in determining these conditions in each particular case, a brief account of the essential aspects of environmental protection concerns for each type of organization is given below (figure 3).

### 2.1 GOVERNMENT OFFICES

Their function is to provide the citizens of the country and enterprises with protection or a service. The government is responsible, in the interests of all, for environmental monitoring and protection as well as for the quality of life of the population.

The criteria for choosing the information to be sought are linked to the service to be provided and to the area to be administered (international, national, regional, local, etc.).

The services to be provided, outlined in the previous paragraph, are part of the essential

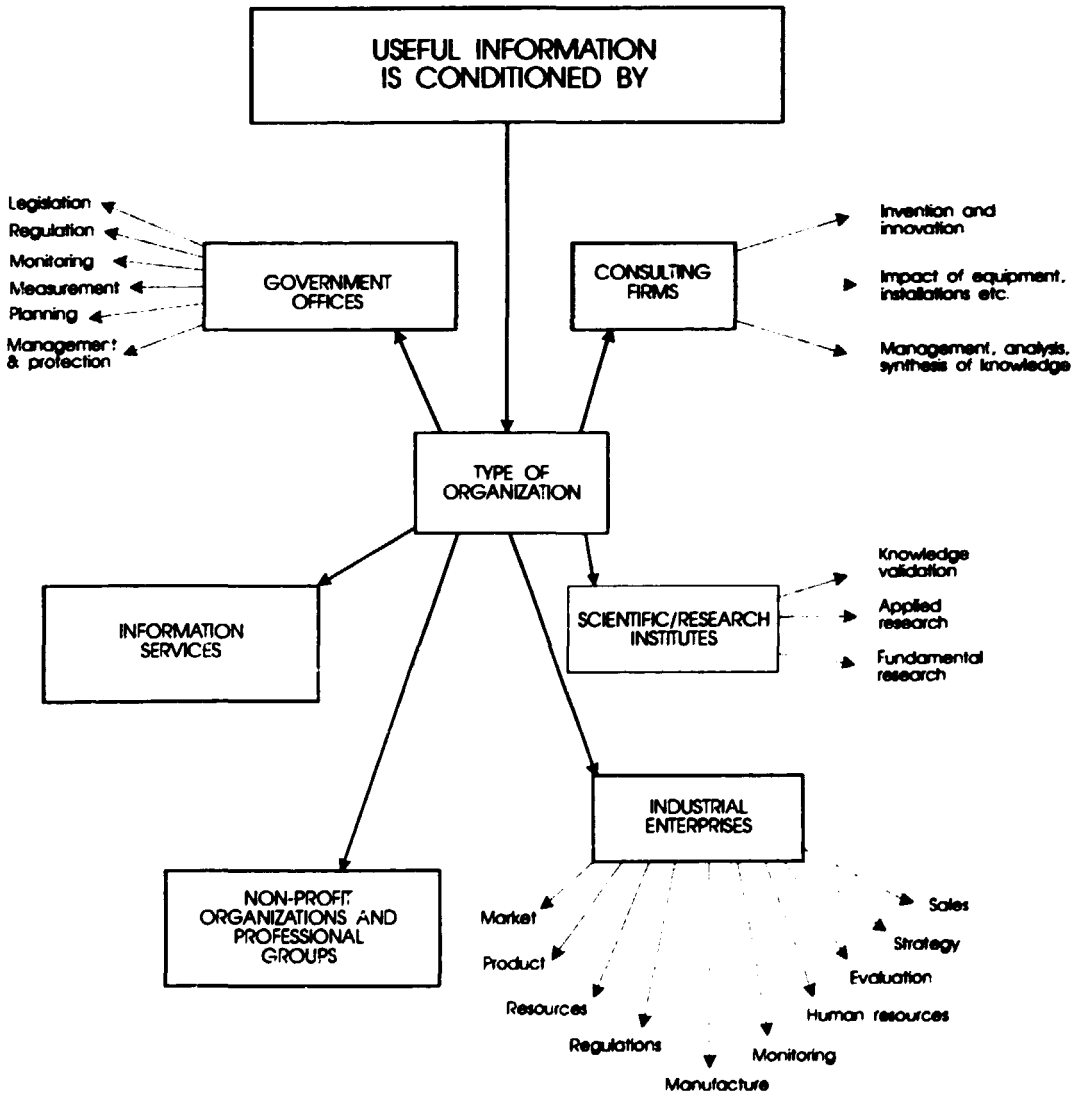


Figure 3 Categories of organizations and their activities

objectives of a government office. Specifically, they comprise legislation, regulations, monitoring, measurement, physical planning, the management of natural resources, protection of the population's health, etc.

Also, the information needs for these various activities have priority, and the budgets allocated will generally be higher than in the case of an enterprise.

The areas administered vary from the local to the international level. It follows that the budgets, the information to be collected and the ways and means for disseminating it vary accordingly, as illustrated by the following two examples.

**Example 1:** A ministry of environment wishes to install equipment for monitoring  $\text{SO}_2$  and  $\text{NO}_x$  emissions from thermal power stations in order to verify whether the processes used make it possible to conform to the new standards required by law. For that purpose it needs to know the range of processes for monitoring emissions and for the desulphurization and denitrification of emissions; the need covers both the characteristics and the costs of processes, as well as their operational and maintenance characteristics.

**Example 2:** A public body must rapidly license the construction of a paper recycling plant. It needs information on paper recycling processes, as well as on the environmental impacts of such plants.

## 2.2 INDUSTRIAL ENTERPRISES (producing consumer goods and services)

Enterprises, as well as designers and consultancy bureaux, are actively engaged in industrial development; their objective is to produce and sell goods or services at a profit. Costs, working times, and short-, medium- and long-term economic optimization are essential factors in production and profitability; they have a direct bearing on the information sought. So,

environmental protection influences the price of the product sold and consequently the market. Manufacturing a clean product has a direct effect on its distribution, therefore a compromise has to be struck between market factors and the prime cost of the clean product. Specific information is essential in striking this compromise.

The environmental problems to be solved are linked to the principal activities of the enterprise and knowledge of the national or international market:

- innovation and design of a product;
- utilization of raw materials;
- compliance with international regulations;
- the manufacturing process for a product;
- monitoring the qualitative and quantitative aspects of the products and processes;
- human resources;
- maintenance and development of skills;
- valuation of results;
- elaboration of a strategy;
- the sale of products and services.

The question of environmental protection can arise in the course of each of these activities:

- What are the regulations in force in the zones in which the factories are established and in their vicinity? How should they be applied?
- How should a clean product that is competitive on the target markets be designed?
- How should the risks of pollution resulting from the manufacture, distribution and use of a product be averted?
- How should the effluents and emissions of an industrial installation be measured, monitored and reduced?
- What costs and benefits can be expected from the introduction of non-polluting processes or the installation of treatment, recycling or recovery processes?
- What are the economic effects of evaluating risks in the context of improved prevention of industrial accidents?

The information necessary for replying to these questions is specific to each case. In all cases, it is complex and involves taking into account the essential objectives of the enterprise concerned, as the following examples illustrate:

**Example 1:** An enterprise for the destruction of toxic wastes has developed a new (clean) process for the destruction of PCBs in used oil and has acquired the exclusive world patent for this process. It then wishes to increase the market for this product and to set up a sales network and seeks information on:

- the extent of environmental problems linked to PCBs in certain parts of the world in which it wishes to establish itself;
- legislation concerning chemical processes occurring on the immersion of PCB-contaminated oils in the sea;
- the international toxicity classification of oils containing PCBs;
- the law on international transport and storage;
- country data regarding quantities of contaminated oils, etc.

**Example 2:** A steel producer wishes to protect the health of workers in his factory. For this purpose he envisages setting up a service for the measurement and monitoring of pollution linked to the dust and gas discharged into the atmosphere inside and outside the establishment and in the surrounding water system. He therefore seeks information on processes for monitoring aerial and water pollution and on personnel training programmes that can be of assistance in setting up the service envisaged.

**Example 3:** An industrial corporation that has decided to use pine-oil industry wastes to produce dyes and seeks information on appropriate technologies. He knows that the polyphenolic derivative that is produced in large quantities and that can be used as a dye can also be used as a bonding material and an adhesive in the manufacture of particle board, when combined, polymerized and hardened by the use of other products.

### 2.3 CONSULTING FIRMS

Such bureaux work upstream of industrial development and are engaged in the design, study, preparation and execution of infrastructure projects, the construction of industrial installations and buildings, and the development of products, etc.

In each of these projects, there must be concern for environmental protection, which will have different effects in each case. The concerns of consultancy bureaux coincide with those of enterprises, with the difference that they must take more account of future aspects and are constantly confronted with special cases.

The environmental problems facing such bureaux are related, for example to:

- Development and dissemination of new "clean" processes, new technologies or new products;
- Environmental impact of infrastructure, equipment and installations (environmental impact assessment and impact on the population are stipulated in some development projects);
- Compilation of dossiers on the current situation and the forecasting the possible impact of development in all its forms.

Criteria for choice of the information sought are the same as those adopted by research institutes and centres, but:

- Greater weight is attached to cost and time factors, which may become fundamental criteria of choice;
- Indicators must be very carefully selected, taking into consideration the objective of the study undertaken, for reasons of rapid and maximum profitability.

### 2.4 SCIENTIFIC INSTITUTES FOR FUNDAMENTAL OR APPLIED RESEARCH

Their objective is to acquire knowledge or to transpose it from one sector to another or from one type of application to another, and information is the basis of their activity. Substantial time and budget resources are devoted to their work.

The information that these institutes may need is related, for example, to:

- The collection, intensification, development

and management of knowledge on the relationships between constituent elements of the natural environments and the different aspects of human activity;

- Fundamental research in physics, chemistry, biology, etc., applied to the relationships between products, materials (heavy metals, chemicals, etc.) and organic tissue (vegetable, animal) in the air, soil or water, within the food chain;
- Work on interactions and the means of transfer of pollutants and contaminants between environments, etc.

The criteria for choice of the information sought are as follows:

- Ensuring the reliability and validity (most recent possible date) of the data collected;
- Focusing on a specific target in data collection without dissipating efforts on other fields or targets (a difficult choice in the case of environment and research);

**Example 1:** A research institute in a given country has a contract for providing quantitative data on pollutant flows and on processes involved in the pollution of drinking water reserves by wastes from a tin mine. It then seeks any study that has been carried out on the subject of the environmental effects produced by tin mine wastes, possibly in another country.

**Example 2:** Another research institute that specializes in studies regarding the pulp and paper industries – which finance it – is seeking information on technologies that make it possible to solve a particular pollution problem raised by an alcohol production plant. The objective is to reduce specific pollutant effluents.

- Collecting information that should be useful and easily handled and as exhaustive as possible;  
Facilitating contacts (usually personal) by

means of which productive and continuous interaction can be injected into the research undertaken.

Sometimes, the subjects of research refer to a specific problem case that is submitted to the institute and that it cannot deal with on its own.

## 2.5 INFORMATION SERVICES

### *Documentation services*

Such services accumulate a stock of documentation, manage and improve its utilization, expand the fields of interest covered and communicates with those seeking information with a precise objective in view, etc.

### *Information or teaching establishments.*

Their activity in the dissemination of knowledge requires that updated information be readily available, flexible in use, accessible and presented in a form that facilitates the preparation of a digest.

### *Organizers of congresses, meetings and exhibitions.*

Whether they are organized by municipalities, national or international authorities, or museums, etc., meetings or exhibitions devoted to single themes are based on the accumulation and prior choice of complete and up-to-date information.

The choice of information will depend on the services each of the above offers. For example:

- External contacts in order to obtain the information desired are the preponderant factor. A survey of information sources capable of supplying useful information is a prerequisite for the work;
- Subject dossiers must be set up and so arranged that the information can be found quickly.

In creating information facilities as well as in fixing priorities regarding information gathering, pride of place is given to defining the information required, procedures for supplying it to users and the working processes and facilities, costs, etc. – in short, the topics that are being dealt with in this methodology.

## 2.6 NON-PROFIT ORGANIZATIONS AND PROFESSIONAL GROUPS

In the information activities of these associations, the relevant conditions and procedures coincide

with those of the bodies mentioned above. The price to be paid depends on the association's information budget and aims.

The choice of information to be disseminated depends on its policy, the concerns of its members, its desire to encourage contacts among members and, finally, on its operating characteristics.

### 3. WHAT IS THE COUNTRY SITUATION?

The need for information regarding the environment is felt in all countries and in all bodies, whether closely or distantly connected with industrial activities. As far as the environment is concerned, the activity of any organization whatsoever cannot be dissociated from the general socio-economic framework (figure 4) because the nature of the need and the information mechanisms as well as the objective of action vary just as much as the conditions under which the need is felt.

Needs for information on the environment will differ, depending on the length of a country's industrialization history, the place of industrial development in development policy as a whole, depending on the options concerning the environment that are enshrined in that policy. The means used to obtain useful information will also differ.

In fact, the stage of industrial development directly influence industrial experience (clean processes and technologies, for example) and the framework of environmental regulations that have to be observed by the organizations affected; they also influence the existence of special relations with, on the one hand, industrial groups in the country and abroad (holding of patents, transfer of technology, training courses, etc.) and on the other hand, with varied information sources.

The more industrialized a country is, the easier and more diverse will be the means of access to information on the environment (in terms of time and cost).

The problems (including financial problems) and concerns (including priorities and criteria for choice) regarding the environment, technologies and innovation, measurement and monitoring, prevention, reduction of pollution, organization and the specific growth of industry and the environment, etc. vary according to a country's stage of industrial development.

The nature and above all the sources and origin of useful information will differ according to these characteristics.

Defining what information is useful will depend on:

- The nature and importance of the industrial sectors;
- Development objectives and the degree of integration of environmental concerns in economic and territorial planning;
- Priorities for action, depending on development priorities and choices (whatever their bases) between short- or longer-term objectives (the latter favour taking the environment into consideration in decisions).

The characteristics of the information to be obtained and the collection and dissemination procedures will depend on these objectives, choices and priorities. They are therefore an important element at the stage of analysis and definition of needs in the choice of information suppliers. For example:

- An organization situated in an industrialized country will usually need information on markets, patents, legislation, and regulations, etc.;
- An organization in a country that is in the process of industrialization will usually need information on processes (for manufacture, for reduction or prevention of pollution, monitoring and measurement of effluents, etc.), their cost, environmental standards in other countries and the impact of a projected factory.

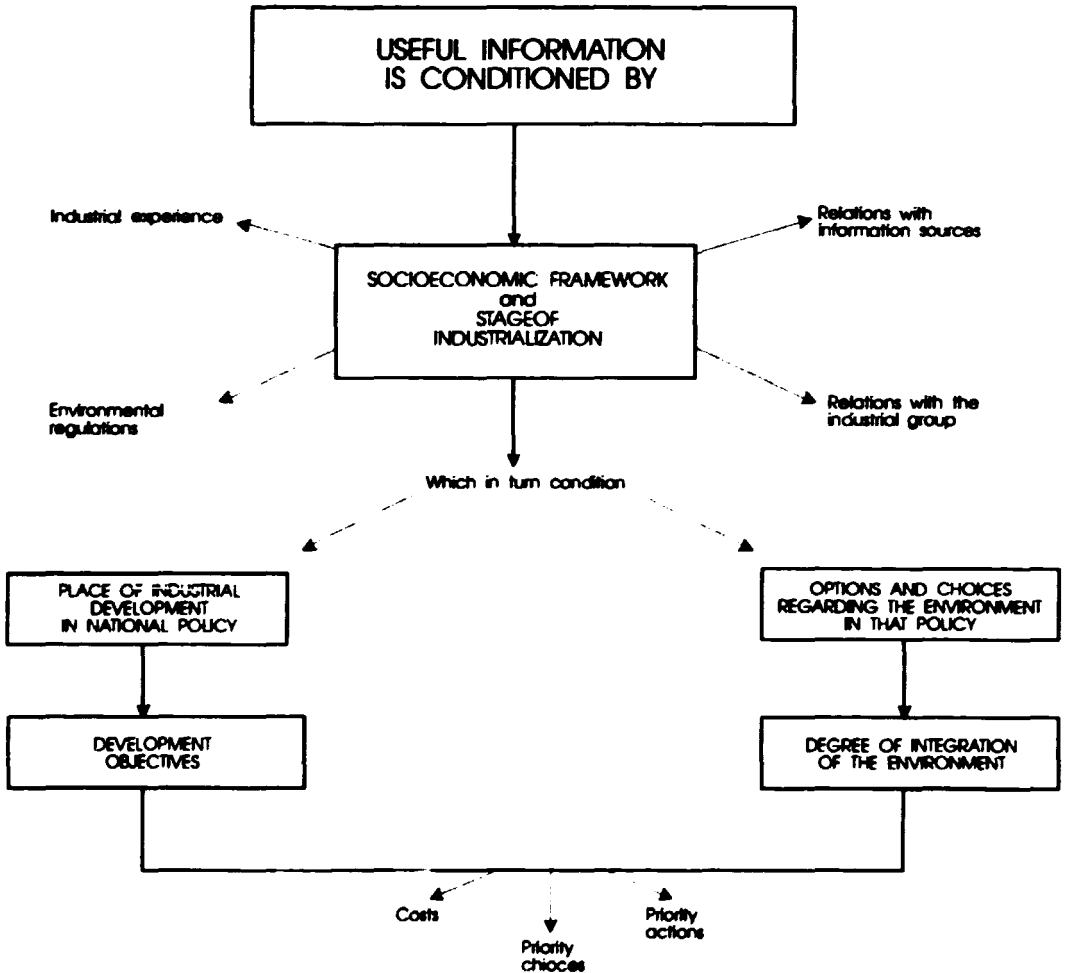


Figure 4 Stage of industrialization and environmental information requirements



**“It is impossible to effect a systematic transfer of information from one country to another, or to apply an analysis of national information needs to a foreign context, even where dealing with engineers employed by the same kind of organism. The nature, source and origin of useful information vary as a function of the level of development within the given country, and the modalities for collecting and diffusing information.”\***

\* “Methodological approach for identifying the information needs of the engineer” (Provisional text) UNISIST, UNESCO, 1984

# CHAPTER 2

## THE PROCEDURE

### THE PRINCIPLE OF THE PROCEDURE

The preceding chapter described:

- The variety of activities and situations that may be faced in the context of environmental protection;
- The process for the diagnosis of each case with the aid of a standard method, such a diagnosis necessarily preceding and influencing the search for information;
- How the importance of the action envisaged, firstly to the organization involved, and secondly to the country, affects the method used to obtain the necessary information (figure 5).

### KNOWING WHAT ONE WANTS

The analysis of the action envisaged or the problem to be solved was explained in Chapter 1.

It makes it possible to determine:

- The objective in terms of the information sought;
- The context in which such information will be utilized;
- Conditions affecting the acquisition of information—time required, permissible cost, quantity of information to be gathered, degree of accuracy needed. These conditions are a guide in the choice of information mechanisms that permit the optimum quality/price ratio in the light of the aim pursued;
- Priorities in the search for such information.

### DETERMINING THE CHARACTERISTICS OF THE INFORMATION SOUGHT

#### IDENTIFYING INFORMATION SOURCES

Precise knowledge of the objective in terms of the information required and of the context in which it will be used makes it possible (figure 6):

- To determine the subject of the information

(the field of interest to which it is related) and, for each subject, the purpose of the information sought;

- To specify its nature—scientific, technical, economic, legal, geographical;
- To limit coverage in time: how far back it is useful for the search to go;
- To choose its origin—in the organization concerned, in the country itself, abroad.

Information that is useful, defined in this way, is found in documents (in the widest sense of the term) or in information sources of various types that are specific to the case under consideration.

The analysis of the activity envisaged and the identification of useful information makes it possible:

- To select, from possible sources of information, those in which the information sought is most likely to be found;
- To distinguish in each case between three categories of documents (or sources)—documents from the organization itself, documents from its country of establishment or documents from abroad.

### CHOOSING THE MEANS TO BE USED IN OBTAINING THE INFORMATION SOUGHT

By defining the characteristics of the information sought, selecting the preferred means to be used in finding it, as well as by determining conditions for obtaining it, it is possible:

- To select from the organizations that supply information to third parties those that are likely to provide what is wanted (information and documents) on the conditions desired;
- In consulting those organizations, to choose procedures that are appropriate to the user's requirements (computer media, electronic transmission, mail, word of mouth, etc.).

The procedure is the same for finding a product,

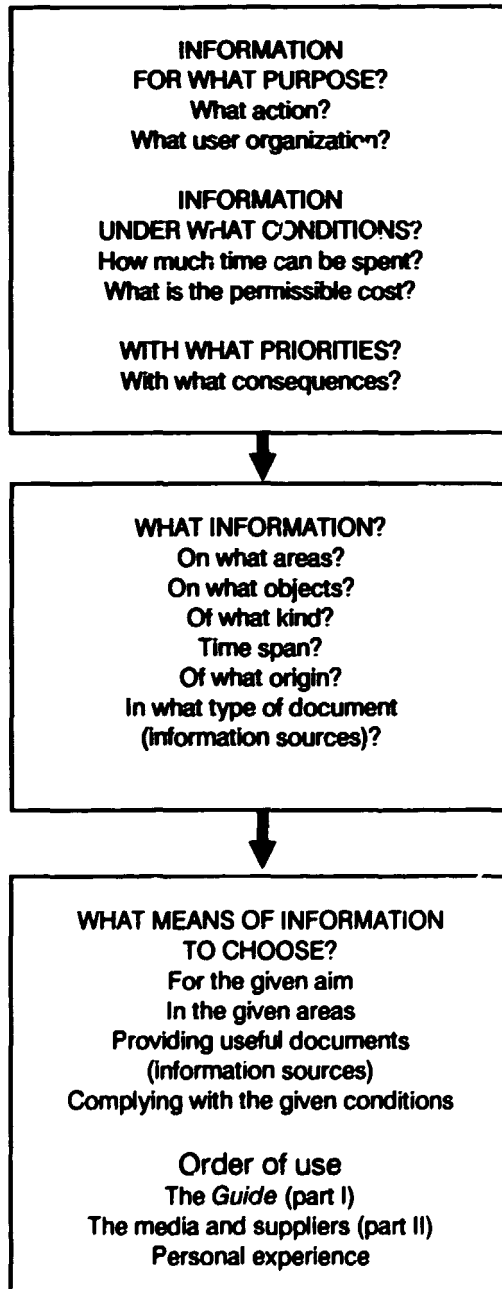


Figure 5 Principles governing the information seeking procedure

## Information...but not just any information

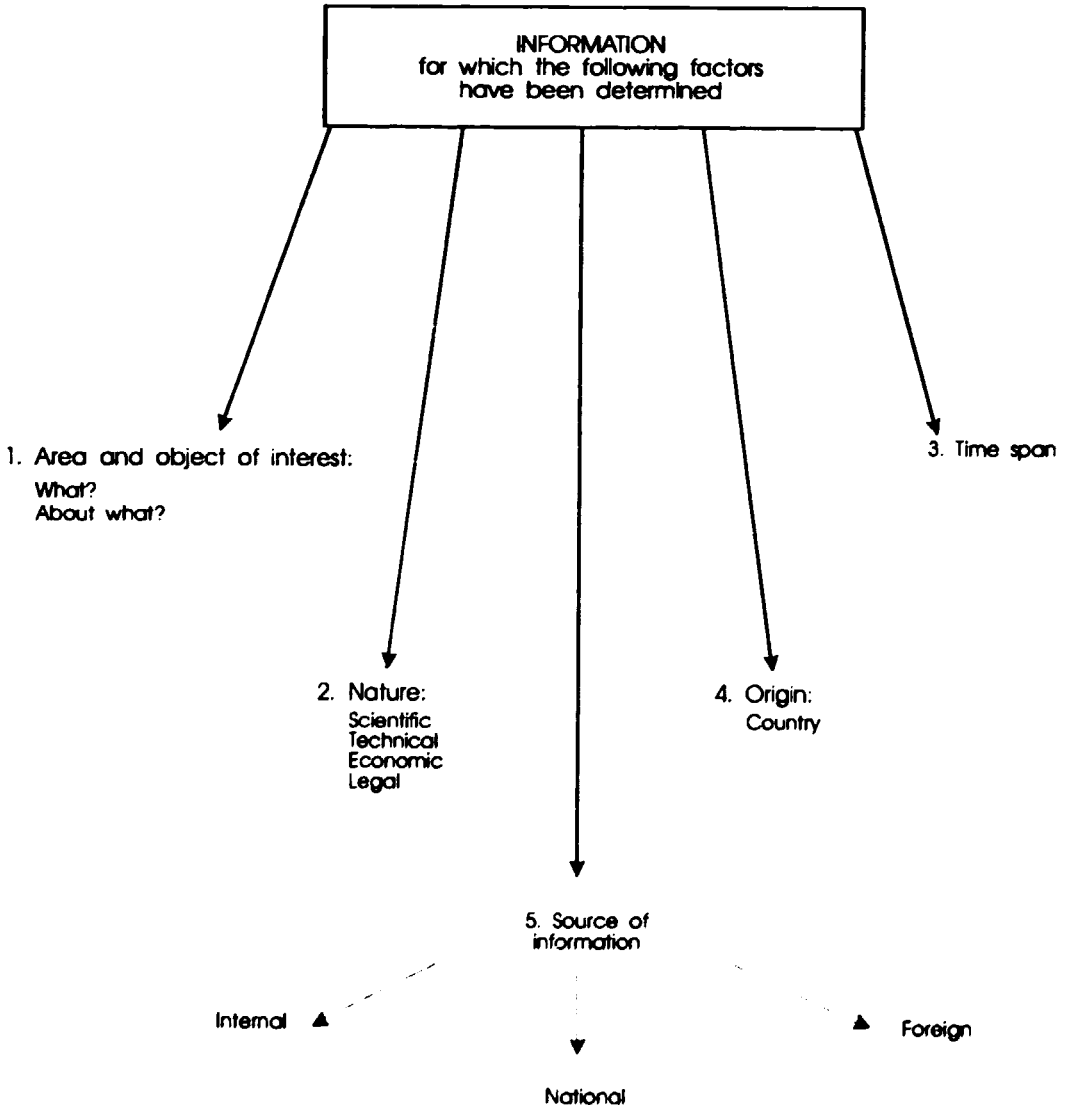


Figure 6 Characteristics of useful information

a material, a process, or an item of equipment. For that reason, agencies that provide third parties with information (information centres, libraries, press centres, documentation centres, operators of data banks, etc.) are referred to as "information suppliers".

The following sections will explain how to proceed on the basis of this principle, following the outline given in Chapter 1. With the aims of facilitating use of the procedure, ensuring a methodical approach and rapid operation, suggestions are given for each stage from which it is merely necessary to make a choice.

### What is meant by an "information service"?

An information service is offered by organizations that collect data and use information sources in order to facilitate the supply of information to third parties.

Information is supplied either directly by replying to specific requests or by means of products such as periodical bulletins, data banks, bibliographic synopses, etc.

For the reasons indicated in explaining the principle of the procedure and for purposes of simplification, such agencies are referred to as "information suppliers".

Selection of the appropriate supplier depends on characteristics peculiar to the organization, such as:

- Its objective – what is the target clientele? what is the clients' "mission"?
- The field of interest of the information collected;
- The nature of the information sources consulted such as specialists, samples, written documents, films or even the nature of the information itself;
- The stage of processing of the information sources consulted;
- Credibility – conditions for and quality of collection and processing of the information supplied;
- The (geographical) origin of the sources used or of the information collected;
- The mode of consultation of the organization or the products that it supplies by word of mouth (telephone, personal visit, etc.), mail, computer media (consultation of data banks, electronic information agencies, etc.), miscellaneous electronic transmission facilities (telex, teleconference or fax).

The final choice depends on the permissible cost of the information to be obtained, deadlines, additional work that is necessary as a result of the form in which the information is provided, as well

the factor of convenience for the person consulting it.

In Annex 2, categories of information suppliers are presented and classified according to the stage of their documentation processing.

In Part II of the *Guide*, organizations that provide information particularly dealing with environmental protection are listed, indicating their main activities as far as it has been possible to obtain the relevant information. Additional components of Part II list information products such as databases, bibliographic and audio-visual material. All of Part II has been cross-referenced through the main subject index.

#### NOTE:

It should be noted that, owing to its complexity, a need for information can seldom be completely satisfied by a single information source. If the source is outside the user's organization, information on the latter is unlikely to be available. Many suppliers do not use living sources, which could be a primary source for the information sought. Services of a single supplier or source will not necessarily suffice for each request since cases are mostly complex and/or specific.

Thus, in most cases, it is desirable to consult several "suppliers". The choice of these suppliers will determine the reliability of the information received, savings in the time spent in using them and the assurance that possible budget constraints will be observed.

The choice will more efficient when:

- It is known what is wanted and under what conditions (covered by phases 1 and 2 of the proposed method);
- A wide range of information suppliers is available in many countries as well as in international organizations (covered by Part II);
- Choices are made in such a way as to ensure the greatest possible reliability of the information required.

## PHASE 1: STATE WHAT IS WANTED – PURPOSE OF INFORMATION AND CONDITIONS

Refer to Chapter 1 and:

- Choose the organization (source) related to the particular case for which the information is sought;
- Take into account special conditions in the country concerned by consulting Chapter 1, Section 3;
- Analyse the case in question with the aid of the following tabulation.

### 1. WHAT ACTION IS ENVISAGED?

#### 1.1 WHAT IS THE CURRENT STAGE OF PROGRESS?

- Decision
- Analysis
- Innovation
- Design
- Implementation
- Dissemination

#### 1.2 WHAT IS THE TASK INVOLVED?

- Regulating activities and their impacts
- Environmental legislation
- Establishing standards
- Measurement and monitoring
- Establishing numerical series
- Averting environmental problems
- Economic optimization of the industrial activity
- Reducing pollution
- Complying with regulations
- Developing new markets
- Dissemination of knowledge
- Teaching
- Information
- Other (specify)

## 2. WHAT IS THE ORGANIZATION CONCERNED?

*Comments*

- Government office (ministry, institute, town council, etc.)
- Industrial enterprise
- Consulting firm
- Institute for fundamental and applied research
- Training establishment
- Information service
- Non-profit association
- Other (specify)

## 3. WHAT ARE THE SPECIAL CONDITIONS IN THE COUNTRY CONCERNED?

### 4. WHAT ARE THE CONSEQUENCES OF THE ACTION ENVISAGED?

#### 4.1 IN THE ORGANIZATION CONCERNED

*Specify*

- On overall policy
- On the retention of markets
- On the creation of new markets
- Other (specify)

#### 4.2 IN THE COUNTRY IN QUESTION

- On industrial activity as a whole
- On public opinion
- On a group of persons
- Other (specify)

#### 4.3 FOR THE ENGINEER OR TEAM IN CHARGE

## 5. CONDITIONS FOR OBTAINING INFORMATION

Depending on the replies to the four questions above, evaluate the following aspects:

- When will the information be used?
- What is the deadline for obtaining it?
- What is the maximum permissible cost of the total search?
- Consequently, what is the maximum time that can be devoted to it?

- Less than one hour?
- Less than one day?
- Less than one week?
- More? (Specify)
- What is the degree of precision of the information sought?

**NOTE:**

- If a search is undertaken for other persons for whom is the information intended?

*Comments*

- The officer in charge of the activity
- The manager or managing bodies of the organization
- Persons engaged in a specialized study or running a documentation service
- Environmental specialists
- Laymen
- What are the working languages?
- What environmental knowledge do these persons have?

- In what forms should the information be supplied?
- Original source documents?
- List of addresses or references?
- Dossier?
- Digest, report?

**6. WHAT ARE THE PRIORITIES?**

The permissible cost and time to be devoted to obtaining information necessarily impose limits, therefore a compromise must be struck between obtaining:

- all the information capable of satisfying the information need;
- the maximum amount of information possible in view of the limitations.

For that purpose, priorities will have to be determined that will guide the choice of the information to be collected and, consequently, the choice of information services.

**Example:**

**Information, for what purpose?**

The Indian Ministry of the Environment wishes to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions from thermal power stations.

**Phase 1**

(1) *What is the current stage of progress? Implementation*

*What is the task involved?* Environmental management; measurement and monitoring; reduction of pollution; purchase of equipment for the reduction and monitoring of emissions.

(2) *What organization is concerned?* Government office

(3) *What are the special conditions in the country?* The country is in the course of industrialization, possessing its own industry but wishing to use technologies that may come from abroad.

(4) *What are the consequences?*

(a) *On the organization:*

- Establishment of a service for the operation and monitoring of processes;
- Market study on lowest cost processes.

(b) *In the country concerned:*

- Excessive cost of equipment;
- Positive impact on the population and the environment! (at the national and international levels).

(5) *What are the requirements?*

- *Deadline for the availability of the information in proper form:* four months.
- *Maximum cost of search:* to be defined (depending on the decision regarding application).
- *Maximum time available for the information search:* three months.
- *File intended for:* management bodies.
- *Working language:* English.
- *What form?:* File on processes (characteristics, origin, purchase price, operating cost, maintenance costs).

(6) *Priorities?*

- Catalogue of processes for reducing gaseous emissions, classified by costs/quality.

**NOTE:** Details of Phase 2 of the process are given in the following section.



State in a few lines the priority concern in the action to be carried out or the problem to be solved.

## PHASE 2a: DESCRIBE THE INFORMATION SOUGHT

Referring to replies to Phase 1 questions and with these as a guide, describe the information sought with the aid of the following sections (see also figure 6).

Enter the results in Table 2.

### 7. WHAT ARE THE INFORMATION TOPICS?

The information topics are determined by the field to which information is related, and in any one field to its specific purpose and the task involved. This is established by asking the

following questions:

- What is the nature of the information?
- What is the sector?
- What is its subject matter?
- What is its purpose?

#### 7.1 WHAT IS THE NATURE OF THE INFORMATION SELECTED?

Specify in Table 1 the nature of each item of information: scientific, technical, economic, legal, etc. This is a guide in the choice of suppliers, who differ according to the type of information that they handle.

#### 7.2 WHAT IS THE SECTOR IN QUESTION?

Chapter 1 explained that information could be collected on different sectors (which vary from case to case) from a variety of sources.

Figure 7 shows a group of major sectors that might be taken into account in the search for appropriate information.

#### Example:

Characteristics of the information sought (Continued from previous example)

The Indian Ministry of the Environment wishes to reduce SO<sub>2</sub> and NO<sub>x</sub> emissions from thermal power stations.

It wishes to know:

##### a. The field:

gaseous emissions.

##### b. The subjects:

- Subject 1:
  - (b.1) = emission desulphurization and denitrification processes;
  - (b.2) = costs;
  - (b.3) = operating and maintenance characteristics;
  - (b.4) = space requirements (site)
- Subject 2:
  - (b.5) = systems for treatment and utilization of residues.

##### c. Nature of information:

b.1 and b.5 - technical

b.2, b.3 and b.4 - economic

##### d. How far back?:

b.1 and b.5 - less than five years

b.2 and b.3 - less than one year

b.4 - more than five years

##### e. Origin:

Internal

c.1 - Internal services of the Ministry responsible for monitoring pollution and for the energy sector (for b.1 to b.4), and those responsible for waste management (b.5):

External

c.2 - Indian Ministry of Industry (services responsible for the operation of power plants) (for b.1 to b.5);

c.3 - Indian Chambers of Commerce (for b.1, b.2 and b.5);

c.4 - Indian industrialists and regional and national professional associations (for b.1, b.4 and b.5);

Foreign

c.5 - Foreign embassies (commercial attachés) (for b.1 and b.5);

c.6 - International professional associations and international organizations (for b.1, b.2 and b.5);

c.7 - Manufacturers (for b.1 to b.5).

A choice must be made among the sources to be searched, depending on the importance of the action in hand, the subject, and the nature of the information sought.

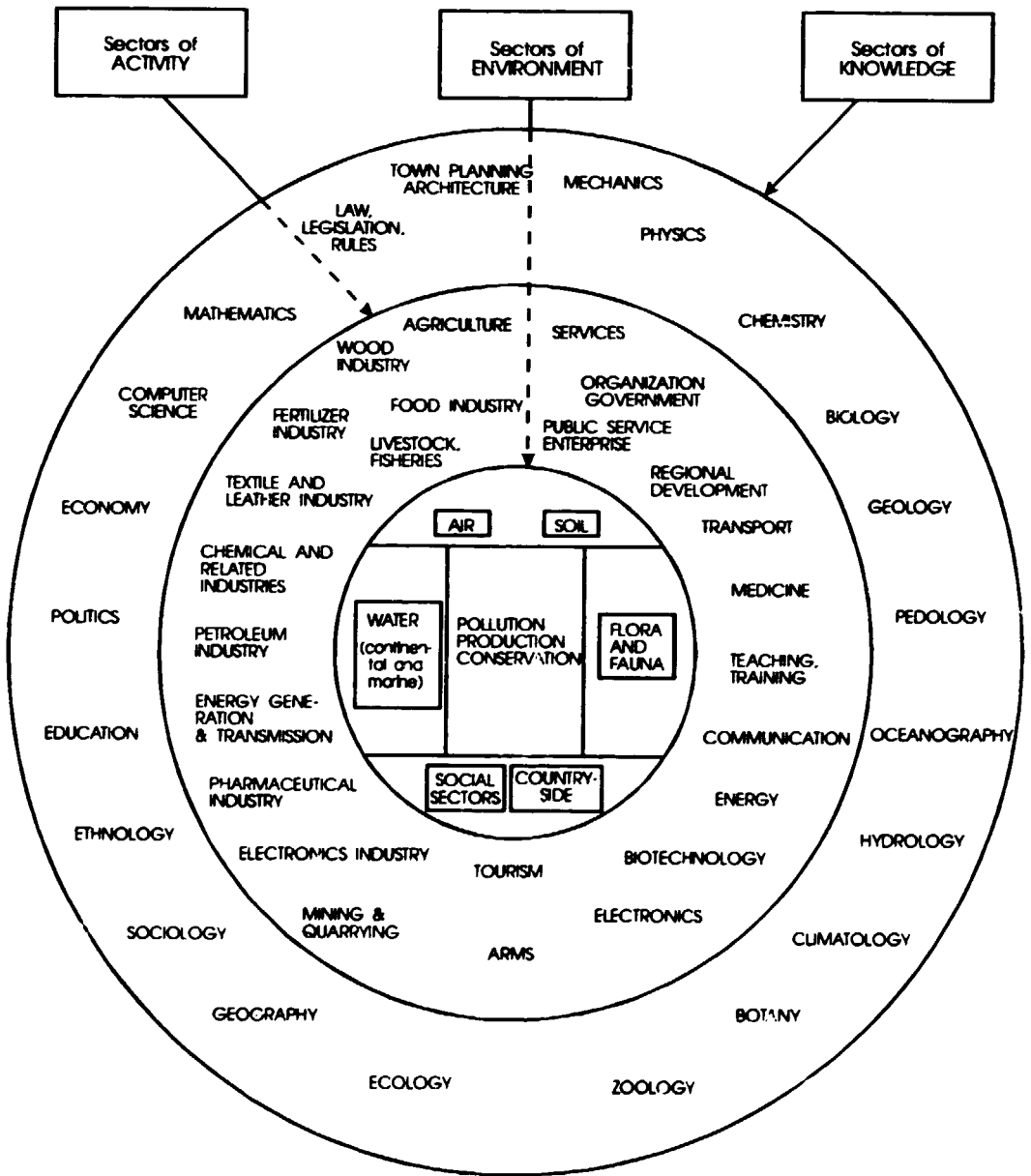


Figure 7 Areas of interest in environmental protection

With the aid of this diagram and on the basis of the replies to the questions raised in Phase 1, specify the required sectors below and enter the replies in Table 1.

Information on:

- Solid domestic and/or industrial waste
- Domestic and/or industrial waste water
- Gaseous emissions
- Toxic wastes and products
- Heavy metals
- Chemicals (detergents) (pesticides) (fertilizers) (other specify)
- Radioactivity
- Noise
- Health
- The establishment of an industrial zone
- Urban development
- Other (specify)

Comments

### 7.3 WHAT IS THE SUBJECT MATTER OF THE INFORMATION?

Figure 8 shows a number of types of information related to environmental protection. With the aid of this diagram determine the purpose of the in-

#### Example:

The previous example showed a request for information on the installation and maintenance costs of emission desulphurization and denitrification processes and on their efficiency (i.e. their conformity to the standards), as well as on systems for treatment and use of residues from these processes. Appropriate information may be contained in:

- Catalogues - an internal source (if the catalogue exists in the services of the requesting ministry), an external source (if the catalogue has to be obtained from another body inside the country), or a foreign source (if the catalogue must be obtained from an organization outside the country). That does not prejudice the geographical coverage (national or interna-

formation sought and enter the results in table 1.

### 7.4 WHAT IS THE ORDER OF PRIORITY OF THE INFORMATION SOUGHT?

Depending on priorities in the action to be taken, as defined in the previous phase (point 6), indicate in table 1 the priority rankings of the information sought.

### 8. HOW FAR BACK SHOULD THE SEARCH GO?

In the light of the objective, it must be specified how far back the information search should go. If necessary, specify this for each of the subjects.

Subject

- Less than one year old?
- Less than two years old?
- Less than five years old but more than two?
- More than five years old? (specify)

### 9. WHAT IS THE ORIGIN OF THE INFORMATION?

Chapter 1 explained that the information to be collected is likely to be of diverse origin, both internal and external, varying according to what is to be done with it. The origin should be specified in each case.

tional) of the catalogue in question.

Depending on the nature of the catalogue, it is possible to obtain a list of suppliers, the types available, possibly their price, technical and maintenance characteristics (which are usually obtained from manufacturers), etc.;

- Publications and periodicals (for technical analysis);
- Patents (to establish who has the know-how and, possibly, distribution rights);
- Reports and studies (internal, external and available from suppliers), to ascertain space requirements, operational efficiency in the environment and in a specific situation;
- Living sources (fairs, international organizations, national and international professional associations) for the opinions of experts, etc.

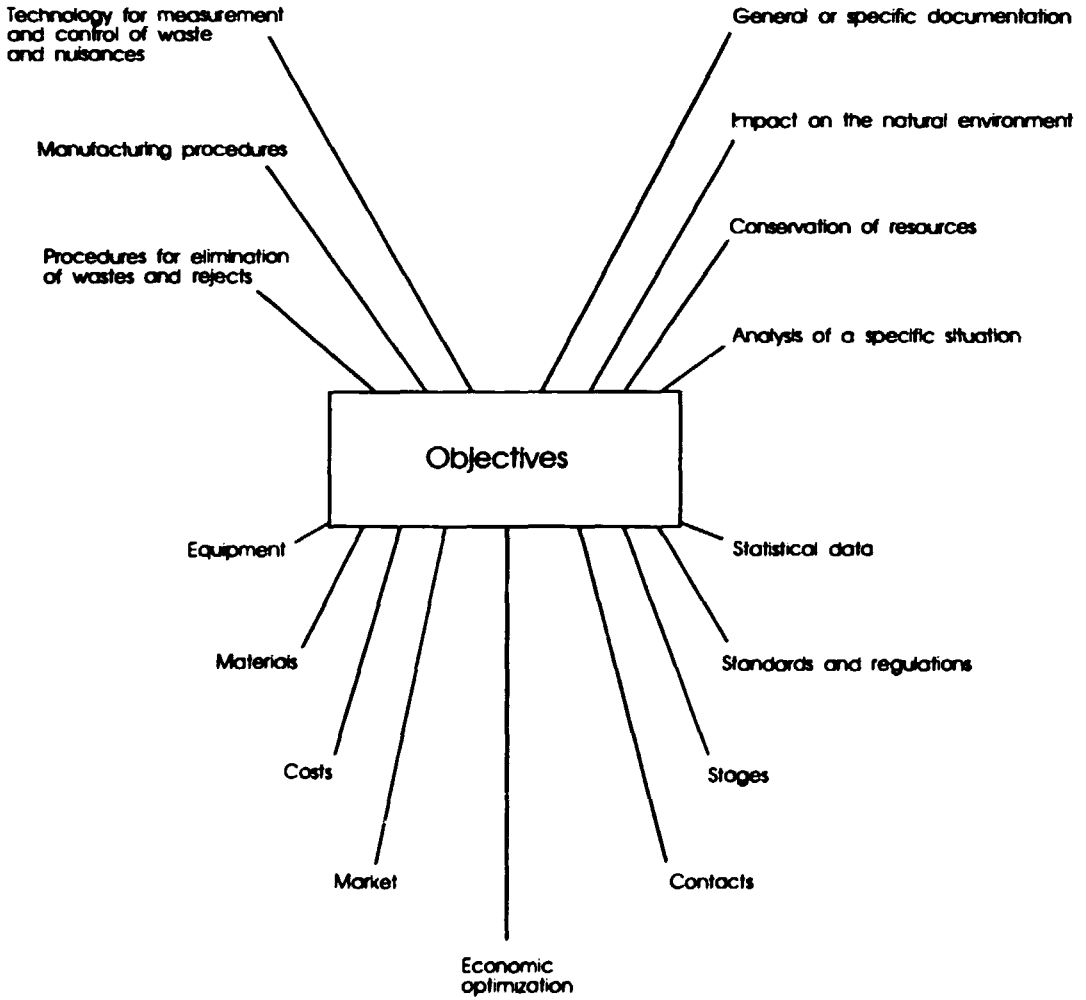


Figure 8 Objectives and utilization of the information

On the basis of Phase 1, specify the origin of the information sought:

- *From the organization commissioning the search*  
What information? (specify);
- *From the country in which the organization is established*  
What information? (specify);
- *From abroad*  
What countries? (specify);  
What information? (specify).

Enter the results of 6, 7, 8 and 9 in table 2.

## **PHASE 2b: IDENTIFY THE SOURCES OF INFORMATION SOUGHT**

The term 'information sources' refers to all means by which the information can be provided. It may refer to persons who pass on their knowledge to others, samples, pictures, diskettes or cassettes, publications or any other written or printed documents.

In Annex 1 particulars on different categories of sources are presented.

### **Why should such a choice be made before the search proper?**

One and the same item of information may be recorded on many media (referred to here as "sources"), whose number grows with the expansion of information technology – diskettes, magnetic tape, electronic newspapers, etc.

Information regarding a particular item of knowledge does not have the same characteristics in each of these media, because they are intended for different purposes. Consequently, the media must be selected whose purpose coincides with that of the information sought.

The correct choice of information media ensures that the information obtained is appropriate for the objective and avoids wasting time in the search.

### **What should the procedure be?**

Refer to Annex 1

- Enter the data recorded in table 2 in table 3;
- For each of the items of information, select the

appropriate information media, taking the results of Phase 1 as a guide. Enter them in table 3;

- Specify their origin with the aid of table 2;
- Use the previous examples as a guide.

## **PHASE 3: PROCEDURE**

Take the comments on paragraph 3 as a guide.

- Refer again to Table 3, as completed in Phase 2b;
- Refer to the supply conditions fixed in advance (Phase 1, paragraph 5) with regard to deadlines, the total permissible cost, the time that can be devoted and the desired degree of accuracy of the information;
- Follow the order of search priority by proceeding as indicated below.

## **10. WHAT PROCEDURE SHOULD BE SELECTED?**

### **10.1 SEARCH IN YOUR OWN ORGANIZATION FOR:**

- The internal information sources identified in the table;
- The external sources of information likely to be found in the organization, particularly if it has a documentation service;
- Highlight them in the table.

Care should be taken to devote to this only the amount of time compatible with the priority ranking of the information sought and with the total time available for the entire information search.

### **10.2 SEARCH IN THE COUNTRY IN WHICH YOUR ORGANIZATION IS ESTABLISHED FOR:**

- Information suppliers who cover the subject or subjects of the information sought;
- Among the latter, select those who operate the information sources identified in the table;
- Specify for the latter
  - Their objective
  - What they do
  - How to consult them
  - Conditions for obtaining information: cost and stage of processing of the information

Enter results of 7 in table 1

SUBJECT \ AREA	AREA												
	Solid wastes	Gaseous emissions	Toxic substances	Chemicals	- detergents	- pesticides	- fertilizers	- others	Heavy metals	Radioactivity	Noise	Health	...
Legislation Regulation Standards	b	3											
Environmental impact Site problems	b	2-3											
Analysis of the situation Numerical data	a-b c	3											
Technologies for measurement and monitoring		3											
Procedures for elimination of wastes and effluents	a-b c	3											
Manufacturing procedures													
Products													
Equipment and material	a-b												
Costs Market	a-b c	1-3											
Economic optimization													
Recycling	c												
Contacts													
Training courses													
Statistics													
...													

Note: The examples used are as follows:

a: Installation of municipal service for household waste disposal

b: Choice of a system for processing solid municipal wastes

c: Installation of a selective garbage collection system (or selective processing) for solid waste recovery and recycling

1. Cost of sewage treatment plant

2. Localization of a sewage treatment plant

3. Choice of a sewage treatment plant

Table 1 Phase 1: Information to be sought

- Credibility;
- Select those that best satisfy your requirements for consultation;
- Highlight on the table can be obtained from those organizations.

The search for possible suppliers may be carried out on the basis of:

- Part II of the manual;
- Directories;
- Personal experience or the experience of colleagues.

### **10.3. ASSESS THE SITUATION**

It is necessary to assess:

- The information likely to be obtained on the spot and in the country;
- The cost and possible deadlines for obtaining information;
- The priorities;
- Gaps, in order of priority.

It is also necessary to evaluate, by reference to the customer's requirements, the suppliers whom it is justified to consult and the necessity or futility of searching for other suppliers.

### **10.4 SEARCHING FOR OTHER INFORMATION SUPPLIERS**

If it should prove necessary to consult other information agencies:

- Commence the search with international organizations by following a procedure identical to that proposed for national information suppliers (point 10.2 above);
- Assess the situation in the same manner as previously (point 10.3 above);

- If necessary, search in the same way for information suppliers in foreign countries chosen according to the origin of the information sources sought.

The search for such organizations is carried out in the same way as for "national information suppliers" (point 10.2 above).

## **11. HOW TO CONSULT THE INFORMATION SUPPLIERS CHOSEN**

### **11.1 PREPARE A LIST OF THE ORGANIZATIONS TO BE CONSULTED**

Refer to table 3 and indicate, for each organization the:

- Information expected;
- Sources of the information processed;
- Consultation mode adopted;
- Possible deadline;
- Geographical and postal address;
- Date of consultation.

### **11.2. CONSULT EACH OF THESE ORGANIZATIONS**

For this purpose, it is advisable to specify:

- What is wanted, that is to say why information is sought;
- The information expected and the sources to be searched;
- The information already available;
- The precise details desired;
- The possible deadlines;
- Procedure for reaching agreement on costs.

### **11.3. CHECK THE ARRIVAL OF REPLIES**

Priority of search	Subjects				Time span		Origin				
					1 year	2 years	3 years	5 years	In the country		In foreign countries
	Internal	External	Which countries?		International organization						

Table 2 Phase 2a: Characteristics of the information sought





# CONCLUSION

The method proposed above makes it possible to overcome information difficulties referred to in the introduction. By this means information can be obtained with the maximum efficiency and on optimum conditions as to cost and time.

It is considered that the procedure is simple and that any apparent complexity is a result of the need to analyse strictly the reason for which any information is desired. This analysis simplifies the search for information because it enables the user to concentrate on essentials.

Another apparent difficulty may be the strict procedure for the choice of information and "supplier.". This does entail a change in information acquisition habits.

Most people involved in industrial development, although used to applying strict criteria in the choice of solutions to their problems, are not so strict on the question of obtaining information. They mostly consult only sources that they know, do not clearly specify what they want and often waste much time on somewhat haphazard searches.

For this reason, the use of this method calls for training in order to change habits and acquire the

necessary reflexes, which can be acquired very quickly.

*Is the method justified in all cases?*

An analysis of what one wants to do, which is the basis of the method, is always necessary, whatever the item of information sought.

Such an analysis gains time and avoids haphazard procedures. Very often, it even avoids the information search itself.

The method should also be used when it is known in advance what source should be consulted. For any particular case, there are usually other more efficient information sources of which one is unaware.

The method is indispensable when a yearbook is consulted.

The guiding factor in the use of the method is the time that can be devoted to the information search in question. The simpler this is and the shorter the permissible search time, the simpler it will be to use the method. On the other hand, a more exhaustive procedure will be followed if one is dealing with a complex action that justifies devoting a large share of the work activity to the search for information.

# ANNEX 1

## CHOOSING THE INFORMATION SOURCE

in the light of the objective pursued

### **A book?**

To learn about the basis of the technique  
To learn about the impact of wastes with or without filters

### **A periodical?**

To keep up to date on new products, process, competitors etc.

### **A report?**

To learn about possible improvements in terms of savings, circuits or results of the introduction of a new material on the filter market where I am exporting

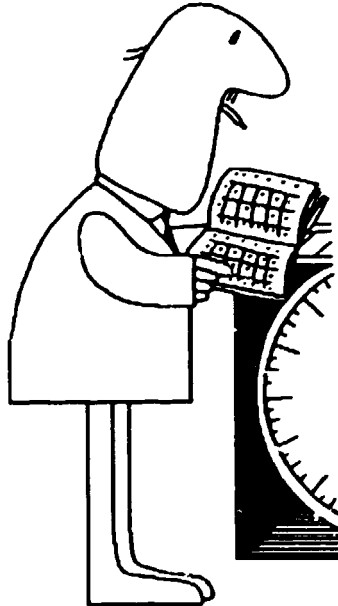
### **A statutory text?**

To learn what must be respected in terms of safety and control

### **A standard?**

To learn specifications or dimensions of materials  
To learn about imposed efficiency limits, in terms of quantity and duration, for a given waste product

*What is the best choice for filters in my case ?*



### **A patent?**

To learn about a new invention or to know whether I can patent a given improvement

### **A supplier's catalogue?**

To learn about available models on the market, their characteristics, capacity and price

### **A numerical data bank?**

To calculate certain characteristics or evaluate the market

### **A sample?**

To know how the model is designed

### **A specialist?**

For advice on the choice of filter and on its installation in specific conditions

### **A program?**

To help with calculations and design of a new filter

Source: Adapted from "La gestion de l'information dans l'entreprise". A. DAVID & E. SUTTER, AFNOR, Ed. EYROLLES, 1985, p. 64.

## ANNEX 2

### CATEGORIES OF "INFORMATION SUPPLIERS"

The suppliers are classified, according to their fields, in four categories presented in Figure 9 below:

- The services of the organization in which the engineer works;
- The groups with which his organization works;
- Information suppliers in the strict sense of the term;
- Government offices.

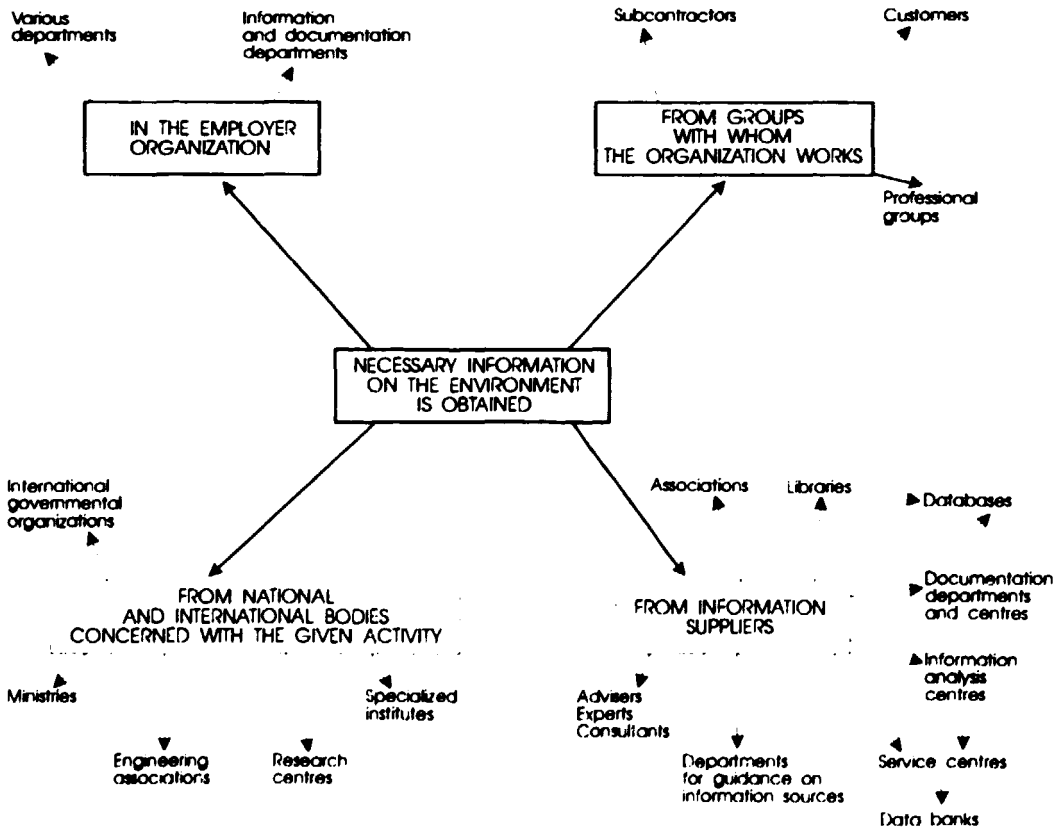


Figure 9 Categories of information supplier

- **Libraries**

These have various objectives as far as the collection of documents is concerned. It is advisable to be aware of their objectives, in order to choose judiciously which of them should be consulted. They are distinguished according to:

- The characteristics of the materials or media used – written documents, disks, magnetic tape, films, samples;

- The types of written documents – some libraries contain publications or periodicals, others have research reports, others patents;

- What they are required to keep – archives, national libraries, specialized national libraries, national patent offices or public libraries, company libraries, school libraries;

- The field covered – some specialize in a particular sector of knowledge and others are multidisciplinary;

- The users for whom they are intended.

- **Documentation services and centres**

Their task is to compile abstracts of information contained in documents. They give references regarding the documents that contain such information and are also differentiated according to:

- The nature of the documents abstracted. Some centres collect all categories of documents, while others collect only certain categories;

- The sector(s) of interest, depending on whether the centre works for a particular sector or for a particular discipline;

- The tasks performed and the services offered;

- The target clientele and accessibility of the

following types

- International (designed and organized to meet the needs of several countries)

- National (meeting the needs of one country in the field that has been assigned to them)

- Professional (meeting the needs of a single profession)

- Individual, belonging to a particular agency.

- **Information analysis centres**

Their objective is to process the content of the documents in order to provide information suited to specific needs. They reply to requests for information, publish digests of data and maintain numerical or factual data banks.

They are differentiated according to the same criteria as above.

- **Computerized information centres**

They compile bibliographical, numerical or factual data banks and operate a remote access service (see Annex 3).

- **Services for guiding users to information sources**

- **Groups of organizations or specialists capable of establishing contacts with living information sources (advisers, experts, consultants), such as professional groups, associations, research centres or specialized institutes.**

These groups themselves usually have information services that can also act as a guide to the user in finding information sources (previous category).

There are also national directories covering various groups, which can be consulted in the documentation and information services of the principal government departments concerned.

# INTRODUCTION

Tout ingénieur, tout acteur du développement industriel, quel que soit son domaine d'activité, quelle que soit sa fonction, est, ou sera, un jour confronté à des problèmes d'environnement.

Quelles sont les techniques appropriées pour lutter contre tel ou tel type de pollution? Quelles seront les conséquences sur l'environnement de la mise en oeuvre de telle nouvelle technologie? Quels procédés permettent d'améliorer l'environnement intérieur des établissements de production? Quels sont les critères d'environnement à prendre en compte lors de la conception d'un produit, dans la réalisation d'un établissement industriel, dans la construction des bâtiments, dans la mise en place d'un barrage? Quelles sont les normes de rejet à imposer à un établissement industriel? Quels sont les dommages, à court et à long terme, que peuvent occasionner les éléments utilisés par les procédés de production et de fabrication? Comment envisager leur raréfaction (économies d'eau, d'énergie, de matières premières, etc.)? Comment gérer les déchets toxiques produits (en tenant compte de la vie utile de fonctionnement ou de consommation des produits et de ceux devenus obsolètes)?

Quel est le coût, le prix de revient ou le gain de telle mesure de protection de l'environnement, face à la concurrence?

Ces exemples illustrent la diversité des préoccupations auxquelles les ingénieurs peuvent être confrontés au cours de leur carrière. Pour les uns, ce seront des préoccupations exceptionnelles; pour les autres, ce seront des préoccupations de routine.

Dans tous les cas, il s'agira de problèmes très spécifiques qui nécessiteront des informations variées, elles aussi spécifiques, propres à chaque cas, à l'organisme pour lequel ils se posent et au pays concerné.

De plus, les relations entre l'activité industrielle et ses effets sur l'environnement naturel autant que sur les sociétés humaines sont complexes et

intéressent de multiples domaines.

Dans ces conditions, comment analyser son propre cas? Comment déterminer les domaines auxquels il se rapporte? Quelles informations faut-il choisir?

Une méthode s'impose pour guider l'ingénieur dans la recherche des informations qui conviennent au problème particulier auquel il se trouve confronté, et ce, plus précisément, parce que:

- L'analyse de chaque cas est complexe. Par suite, quels sont les facteurs à considérer? Comment les évaluer?
- Le domaine "environnement" est flou. Il est interdisciplinaire, susceptible d'interférer avec tous les secteurs de la connaissance et des activités. Mais alors, lesquels choisir? Selon quels critères? Comment?
- La protection de l'environnement intéresse tous les pays et concerne toutes les activités. Il s'ensuit que les moyens d'information ainsi que les organismes fournisseurs d'informations sont nombreux et dispersés dans le monde. Comment les connaître, où les chercher, comment les choisir pour obtenir les informations dont on a besoin?
- Les progrès des technologies de l'information permettent de développer et de créer des modalités d'accès aux informations nombreuses et diversifiées. Comment connaître ces moyens et comment les choisir selon ce que l'on recherche?
- Le domaine de l'environnement est tel que l'explosion et la multiplication des informations ont pour conséquence, soit une sous-information, soit une surinformation, si l'on ne dispose pas d'une méthode pour guider les choix.

Le présent *Guide*, divisé en deux parties, a pour objet d'orienter l'ingénieur dans sa recherche d'informations:

- a) En l'aidant à situer et analyser son propre cas, les conditions dans lesquelles se pose son

problème et les objectifs qui déterminent son besoin d'informations<sup>1</sup> (chapitre 1 de la première partie);

b) En lui proposant une méthode pour caractériser les informations utiles et les recher-

cher (chapitre 2 de la première partie);

c) En lui proposant une liste de moyens ou de fournisseurs d'informations susceptibles d'être consultés (deuxième partie).

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<sup>1</sup> Les spécialistes en environnement connaissent généralement globalement le problème qu'ils ont à résoudre, savent s'il existe des informations pour cela et où les trouver. Dans ce cas, le manuel les aidera à s'orienter pour rechercher les informations complémentaires qui leur sont nécessaires. Pour ceux-là, l'ensemble de la méthode n'est pas à suivre.

## **PREMIERE PARTIE**

### **METHODE**

**Comment s'informer des implications environnementales  
d'un processus industriel?**

11/42



# CHAPITRE 1

## ANALYSE DU PROBLEME A RESOUDRE préalable à la recherche d'informations

### PRINCIPE DU DIAGNOSTIC

**S'informer, c'est d'abord diagnostiquer et analyser le problème à résoudre.**

Le besoin d'informations relatives à l'environnement se manifeste toujours pour une action déterminée qui doit être définie et évaluée avant d'entamer la procédure de recherche d'informations. Il faut d'abord savoir ce que l'on veut faire avec les informations que l'on se propose de rechercher.

La méthode de recherche d'informations sur l'environnement repose sur l'identification précise de l'objectif fixé:

- Quel est le but visé – des informations, pour quoi faire?
- Quelle est l'organisation concernée?
- Quelles sont les conditions dans lesquelles se pose précisément le problème de pollution ou de protection de l'environnement?
- Quelles sont les conséquences de ce problème?
- Quelles sont les conditions particulières d'utilisation des informations recherchées: qui est concerné?

Il convient de souligner que l'ingénieur recherchant des informations sur l'environnement participe, la plupart du temps, quel que soit l'organisme auquel il appartient, à une action collective. La recherche d'informations qu'il entreprend est, elle aussi, collective. La méthode proposée, reposant sur l'analyse de l'action pour laquelle des informations sont à rechercher, est applicable tant par un individu travaillant isolément que par une équipe. Dans ce cas, c'est un guide commun à tous.

Il convient également de préciser que ce guide s'adresse aussi bien aux spécialistes qu'aux non-spécialistes de l'environnement, ainsi qu'aux spécialistes de l'information.

Les spécialistes de l'environnement, des ingénieurs qui sont quotidiennement confrontés à des problèmes d'impact, de réflexion sur les technologies, ou d'applications de procédés industriels, de gestion de produits ou de rejets, de formation, etc., utiliseront pour confirmer ou pour compléter une série d'informations dont ils disposent. Chacun jugera alors, bien évidemment selon son cas, dans quelle mesure il lui sera utile d'appliquer tout ou partie de la méthode.

Les non-spécialistes de l'environnement, des ingénieurs qui sont confrontés à un problème d'environnement de façon occasionnelle, pour la rédaction d'un rapport sur un produit, une technologie, une étude de faisabilité, un projet d'implantation, une application de réglementations, etc., utiliseront pour trouver, organiser et exploiter les informations qui leur sont nécessaires pour la réalisation de leur objectif.

Les spécialistes de l'information l'utiliseront pour répondre à une demande d'informations provenant d'un ingénieur confronté à un problème d'environnement. Le *Guide* permet à l'ingénieur d'analyser avec précision son propre cas et de le faire connaître à celui qu'il charge d'informer; et à ce dernier de faire préciser les données qui lui manquent sur le cas en question, de conduire ensuite la recherche des informations et de les fournir selon les conditions de la demande.

Le guide est un instrument de dialogue entre demandeur et fournisseur; il permet d'éviter les erreurs d'interprétation, le gaspillage de temps, ou le manque de confiance dans les informations fournies, en d'autres termes d'obtenir le meilleur rapport qualité-prix.

Il convient de souligner que ce *Guide* est aussi, pour l'ingénieur, une aide directe pour mener, dans les meilleures conditions, l'action qu'il

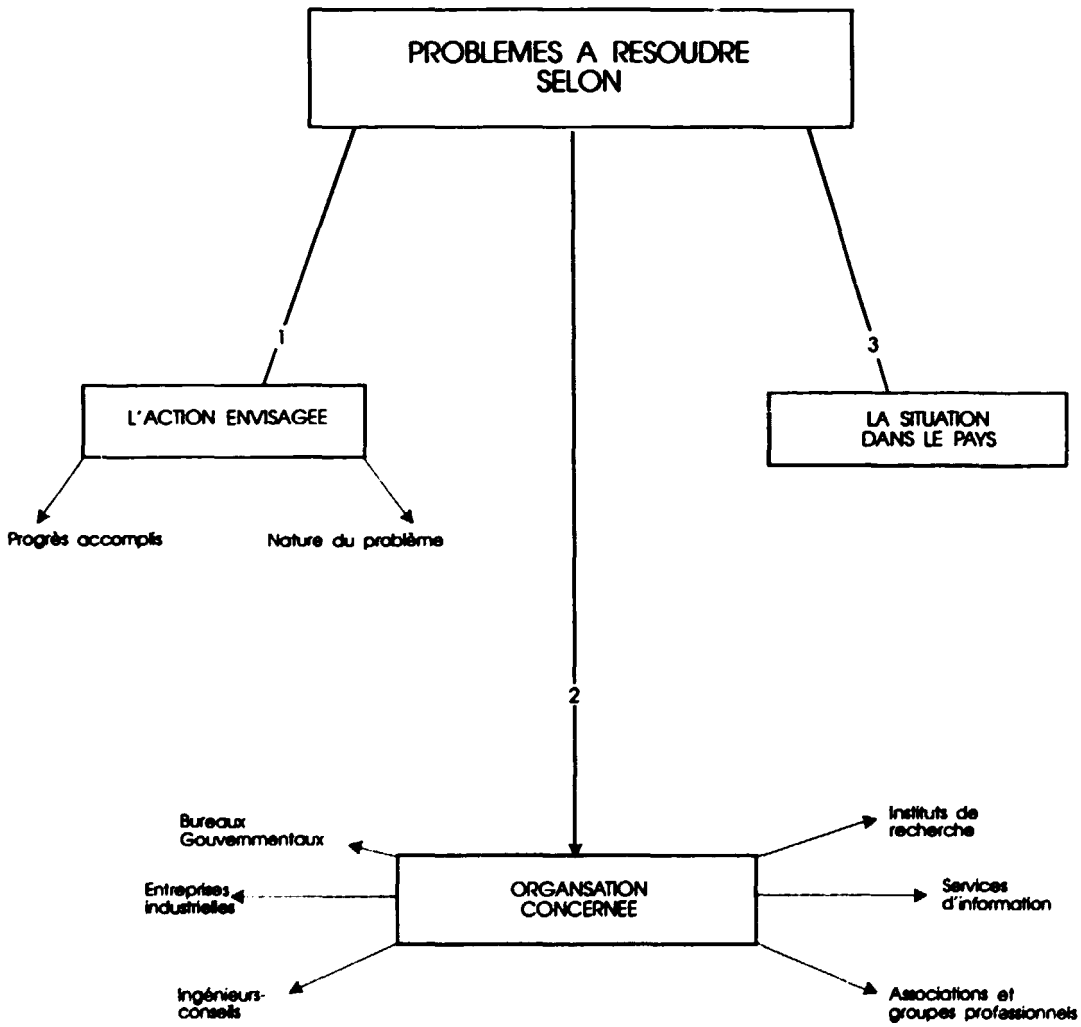


Figure 1 Elements de diagnostic

entreprend. En effet:

- Le diagnostic précis de l'action à mener, de ses objectifs et de ses conséquences, grâce au schéma proposé, conditionne la réussite de cette action;
- La disposition d'informations fiables pour l'action à entreprendre et au meilleur coût réduit les risques d'erreurs et de gaspillage de temps, permet d'utiliser ce qui existe et de limiter le temps d'intervention à ce qui est nécessaire.

Il s'ensuit une réduction des coûts, du prix de revient de l'action à réaliser, et, par suite, des économies pour l'organisation qui la mène.

Le diagnostic du problème à résoudre consiste à définir (figure 1):

- 1) L'action envisagée. Le stade d'avancement – où en est-on? L'objet – de quoi s'agit-il?
- 2) La nature de l'organisation concernée, en distinguant, parce que leurs objectifs sont différents, les entreprises, bureaux d'études, administrations, instituts de recherche, établissements d'enseignement et établissements d'information;
- 3) La situation du pays.

Pour faciliter le diagnostic d'une situation particulière, nous présentons dans ce chapitre des cas de figure types. Nous expliquons également en quoi et pourquoi les besoins d'informations diffèrent selon les organisations (dont les objectifs ne sont pas identiques).

De même, nous mettons en évidence la différence de besoins d'informations d'un pays à l'autre, dans le cas d'actions identiques, du fait que la politique de protection de l'environnement peut être dissimilable.

Les éléments caractérisant une action donnée, un problème à résoudre, c'est-à-dire un besoin d'informations – déterminés en se guidant sur les présentations qui suivent – figurent dans la méthode de recherche que nous proposons au chapitre 2.

## 1. QUELLE EST L'ACTION ENVISAGÉE?

Pour caractériser l'action envisagée ou le problème à résoudre, deux éléments sont à

déterminer: savoir où l'on en est, préciser de quoi il s'agit (figure 2).

### 1.1 OU EN EST-ON?

Pour toute action, une démarche logique est nécessaire. Elle consiste à étudier la faisabilité, la possibilité de cette action, sa réalisation, et de le faire savoir.

Cinq stades d'avancement sont ainsi à considérer: ils nécessitent des informations différentes concernant l'action envisagée, ainsi que, éventuellement, des moyens d'information différents. Ces stades sont:

- La décision (bilan, perception du futur, évaluation des risques, contexte économique, etc.);
- L'exploration (situations existantes, projets, etc.);
- La réalisation (mise au point, fabrication, etc.);
- La diffusion (écrite ou orale);
- L'innovation et la conception.

### 1.2 DE QUOI S'AGIT-IL?

Les ingénieurs confrontés à des problèmes d'environnement peuvent se trouver directement ou indirectement engagés dans un ou plusieurs des cas suivants d'actions types:

- Réglementer les activités humaines et leurs impacts sur l'environnement;
- Gérer l'environnement: légiférer, contrôler, établir des normes, établir ou compléter des séries chiffrées de surveillance;
- Prévenir un (ou des) problème(s) d'altération qualitative ou quantitative d'une ressource naturelle et, pour cela, comprendre les processus d'évolution des milieux;
- Assurer l'optimisation économique, tout en réduisant les pollutions et en respectant la réglementation;
- Développer un nouveau produit, un nouveau procédé, un marché;
- Informer sur les relations activités humaines-environnement;
- Former un personnel sur les problèmes d'environnement liés aux activités industrielles et au développement en général (y compris agricole et urbain).

Ce sont là des activités courantes pour protéger

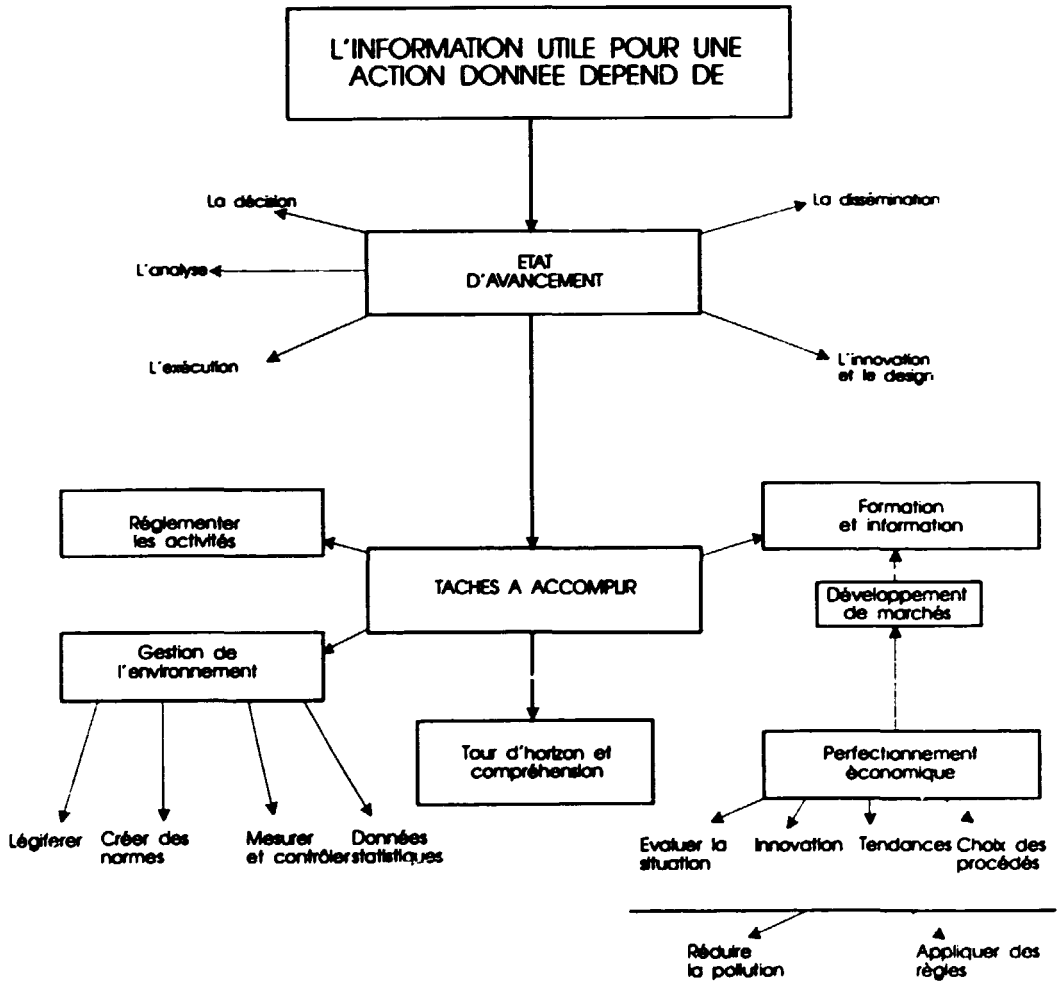


Figure 2 Caracteristiques de l'action envisagée

l'environnement.

Elles diffèrent cependant par leurs objectifs et, en conséquence, par les informations qu'elles nécessitent (figure 2).

#### *a) Réglementer les activités et leurs impacts*

Les administrations ont pour charge d'établir une réglementation qui agit en retour sur l'activité des exploitants, au niveau tant des industries que des collectivités locales, urbaines ou rurales.

Une opinion publique sensibilisée à un problème d'environnement spécifique (pollution accidentelle, détérioration du paysage ou de la qualité de la vie, etc.) s'appuie sur ces règlements et peut agir pour obtenir qu'ils soient pris en compte de façon effective et appliqués dans le respect de la conservation de l'environnement.

Cette action suscite plusieurs besoins:

- Des données chiffrées (statistiques, suivi de données ou données ponctuelles, synthèses, etc.);
- Des normes, réglementations et projets de réglementations, analyses, etc., qui permettent d'effectuer des rapports actualisés sur un état particulier de l'environnement, la nature des problèmes ainsi révélés, leur dynamique et la façon dont on peut envisager de les contrôler ou de les infléchir.

#### *b) Gérer l'environnement*

La gestion de l'environnement est une préoccupation autant économique que politique. Les responsables d'un pays assument, notamment par l'utilisation rationnelle et harmonieuse de l'espace, la conservation du patrimoine national (tant en qualité qu'en quantité).

L'avenir économique d'un pays dépend d'une utilisation rationnelle de ses ressources naturelles.

D'une façon générale, lorsque les ingénieurs ont des activités directement liées à la protection et à la réhabilitation de l'environnement, ils ont besoin d'informations pour:

- Connaître la toxicité des matières premières utilisées et des produits fabriqués;
- Réduire ou modifier les déchets et rejets;
- Limiter ou annihiler leur impact sur l'environnement;

- Protéger les milieux naturels en mettant au point et en appliquant des réglementations (de gestion des déchets, d'urbanisme, etc.);

- Améliorer la qualité de la vie par la maîtrise des nuisances;

- Mesurer, pour contrôler les produits polluants et les facteurs de nuisance.

Plus précisément, la gestion de l'environnement comporte quatre types d'action complémentaires:

#### *Légiférer*

Pour les gouvernements chargés de légiférer et de réglementer, pour les entreprises devant appliquer les textes en vigueur, des informations de qualité sont primordiales. Il peut s'agir de la connaissance:

- Des taux admissibles de pollution des milieux, des normes de rejets et d'émissions, etc.;

- De la nature et de la quantité des polluants produits par l'activité industrielle, agricole et urbaine, etc.;

- De la possibilité de modifier les flux de pollution dans leur pays et dans d'autres, etc.;

- De la protection des milieux naturels fragiles et des paysages face aux pressions qu'ils subissent (agriculture intensive, tourisme, développement d'infrastructures, etc.).

#### *Etablir des normes*

Les normes et les réglementations sont l'expression des pouvoirs publics et de l'industrie pour résoudre les problèmes liés à la protection de l'environnement. Propres à chaque pays, elles sont élaborées par une analyse des risques encourus, pour la population et pour l'environnement, comparée à l'analyse des conséquences de la prévention de ces risques sur la situation de l'industrie et sur son développement.

Les informations recherchées concernent plus précisément:

- La connaissance préalable des normes mises en application dans les autres pays ou reconnues par les organisations internationales;

- Les données scientifiques, technologiques, sociales, sur lesquelles s'appuient ces normes;

- Des données sur les conditions locales permettant d'adapter éventuellement des normes de provenance externe à des conditions locales

particulières.

#### *Mesurer et contrôler*

Pour préparer et réaliser des installations de mesure, pour en contrôler les résultats, l'ingénieur doit disposer d'informations sur:

- Les méthodes de mesure et de contrôle de la pollution dans et autour des établissements;
- Les normes admissibles de produits polluants dans les rejets et les émissions, à l'intérieur comme à l'extérieur des installations;
- Les technologies à mettre en oeuvre pour réduire la pollution.

#### *Etablir ou compléter des séries chiffrées de surveillance de l'environnement*

Les administrations ont besoin de collecter des données concernant les effets sur l'environnement des activités industrielles actuelles et projetées, de la croissance urbaine comme de l'exode rural, du développement d'une agriculture intensive, etc.

Dans cet objectif, les ingénieurs utilisent les études et les recueils de données se rapportant aux impacts des produits et des procédés, les causes et les conséquences des choix faits ou susceptibles d'être faits. Dans un contexte financier difficile, ils s'adressent à des organismes semblables au leur dans d'autres pays. Ils font appel aussi à des consultants, aux services des organisations internationales pour établir les rapports fondamentaux de connaissance de la situation actuelle des pays (ou régions) où ils travaillent.

#### *c) Prévenir et comprendre les problèmes liés à la qualité de l'environnement*

Lorsque l'activité industrielle est susceptible de modifier l'environnement, le besoin d'informations se situe, de plus en plus, en amont du processus de conceptualisation, d'étude et de réalisation d'un produit ou d'un procédé.

Le besoin d'informations s'insère alors dans une réflexion globale qui embrasse le produit et la technologie: depuis sa conception (et donc de la demande du marché), jusqu'à son impact prévisible sur l'environnement (de la production jusqu'à l'usage).

Ce processus est favorable à l'invention et à l'innovation. La rentabilité économique du produit peut être accrue par la suppression, la

modification ou la réutilisation (ou le recyclage) de certains circuits.

Cet objectif nécessite également des recherches – et un cadre législatif permettant de les conduire avant l'autorisation de fabrication et de diffusion des produits – sur la nature, l'ampleur et les effets à terme ou rémanents de la toxicité, pour l'homme et l'environnement, des éléments utilisés dans les procédés.

On peut plus facilement résoudre un problème de pollution à source unique, donc bien localisé (d'autant plus facilement que le problème sera abordé avant l'implantation et la mise en route de l'établissement industriel), que contrôler des polluants à source diffuse et à modes de transfert peu ou mal connus. Les besoins d'informations sur cet objet sont ressentis aussi bien par les administrations que par les entreprises ou les bureaux d'études.

De même, les problèmes de transport ou de transfert de produits dangereux dépassent le cadre de la seule entreprise et ressortissent à la politique de gestion et de prévention des gouvernements.

#### *d) Assurer l'optimisation économique de l'activité industrielle*

C'est l'objectif essentiel de l'activité industrielle. Il est, par suite, nécessairement associé aux préoccupations de l'industrie pour protéger l'environnement, ainsi que, par voie de conséquence, aux informations qui se rapportent à l'une et à l'autre.

D'une façon générale, la recherche de la meilleure rentabilité nécessite des informations pour:

- Faire le point de la situation – évaluer les impacts; évaluer les coûts de production;
- Innover – modifier ou améliorer un procédé de fabrication et réaliser de nouvelles installations;
- Déceler les tendances – évaluation des conséquences d'une situation actuelle, identification de possibilités d'amélioration afin d'obtenir des procédés plus performants et moins polluants, impacts de l'évolution des normes sur les procédés en cours et sur les produits utilisés;

- Choisir un procédé: coût de mise en place et économies réalisables; gain sur le marché futur.

Plus précisément, la protection de l'environnement implique une ou plusieurs des actions suivantes.

#### *Réduire les pollutions*

L'application de méthodes de réduction des rejets, déchets, etc., peut entraîner à terme des gains de production, en ce qui concerne les économies d'énergie, par exemple. La gestion de la production devient ainsi plus efficace.

Le recyclage et le traitement multiplient les marchés, améliorent la productivité, réduisent les investissements nécessaires au contrôle et à l'assainissement des rejets en aval du processus.

Dans beaucoup de cas, le recours à des techniques non polluantes s'est révélé avantageux à la fois pour le public et pour l'industrie.

Dans cet objectif, les entreprises recherchent des informations sur les procédés, les technologies, les matériaux ou les équipements pour agir tant en amont qu'en aval de leur activité de production.

#### *Appliquer la réglementation*

Les normes environnementales à respecter, que peuvent édicter les spécifications et la réglementation en vigueur, véhiculent deux types d'informations différents:

- Elles sont des contraintes et peuvent avoir force de loi – elles sont alors susceptibles d'être imposées, actuellement ou dans un proche futur. Il faut les connaître pour être en mesure de les respecter;
- Elles sont des sources d'informations pour quiconque veut connaître les limites acceptables pour tel rejet ou déchet, ainsi que ses impacts et ses risques.

Mais elles ne sont pas, en elles-mêmes, des limitations. C'est leur usage qui conduit à cette situation.

Tout industriel, tout responsable de collectivité locale, toute autorité territoriale, a besoin d'informations sur:

- Ce que coûte l'adaptation à une norme;
- Comment réaliser cette adaptation à moindre coût, voire avec profit.

L'emploi de technologies et de processus industriels respectueux des principes de protection de l'environnement (économie de ressources et d'énergie, réduction de la pollution, recyclage) permet aux entreprises d'être plus économiques et plus rentables. De nombreux exemples le montrent.

Ces applications donnent naissance à des besoins d'informations chez les entreprises qui les appliquent. Elles ont besoin, plus précisément :

- D'informations sur les technologies nouvelles;
- D'informations sur les taux de déchets et de rejets polluants des procédés disponibles;
- D'informations sur les récupérations et les recyclages des déchets en cours de fabrication et au stade final.

#### *Développer de nouveaux marchés pour de nouveaux produits ou procédés*

Qu'il s'agisse de procédés non nuisibles à l'environnement, d'équipement, de mesure, de contrôle ou de réduction des pollutions, l'innovation dans ce domaine est porteuse d'importants débouchés commerciaux.

Devant l'accroissement des problèmes environnementaux et leur complexité de plus en plus grande, l'industrie est amenée à inventer ou à adopter des solutions techniques acceptables, tant au niveau écologique qu'au niveau économique. Cela concerne, par exemple, la production et la gestion des déchets toxiques, ainsi que la prévention des accidents industriels (évaluation des risques).

Les informations à rechercher concernent plus particulièrement:

- Les marchés;
- Les brevets;
- Les procédés et technologies "propres".

Cette activité est liée aux études de prospective et aux analyses de marché portant à moyen et à long terme.

#### *e) Transmettre des connaissances: former ou informer*

L'échange et la communication d'informations reposent sur:

- La demande d'une information (plus ou moins bien formulée);

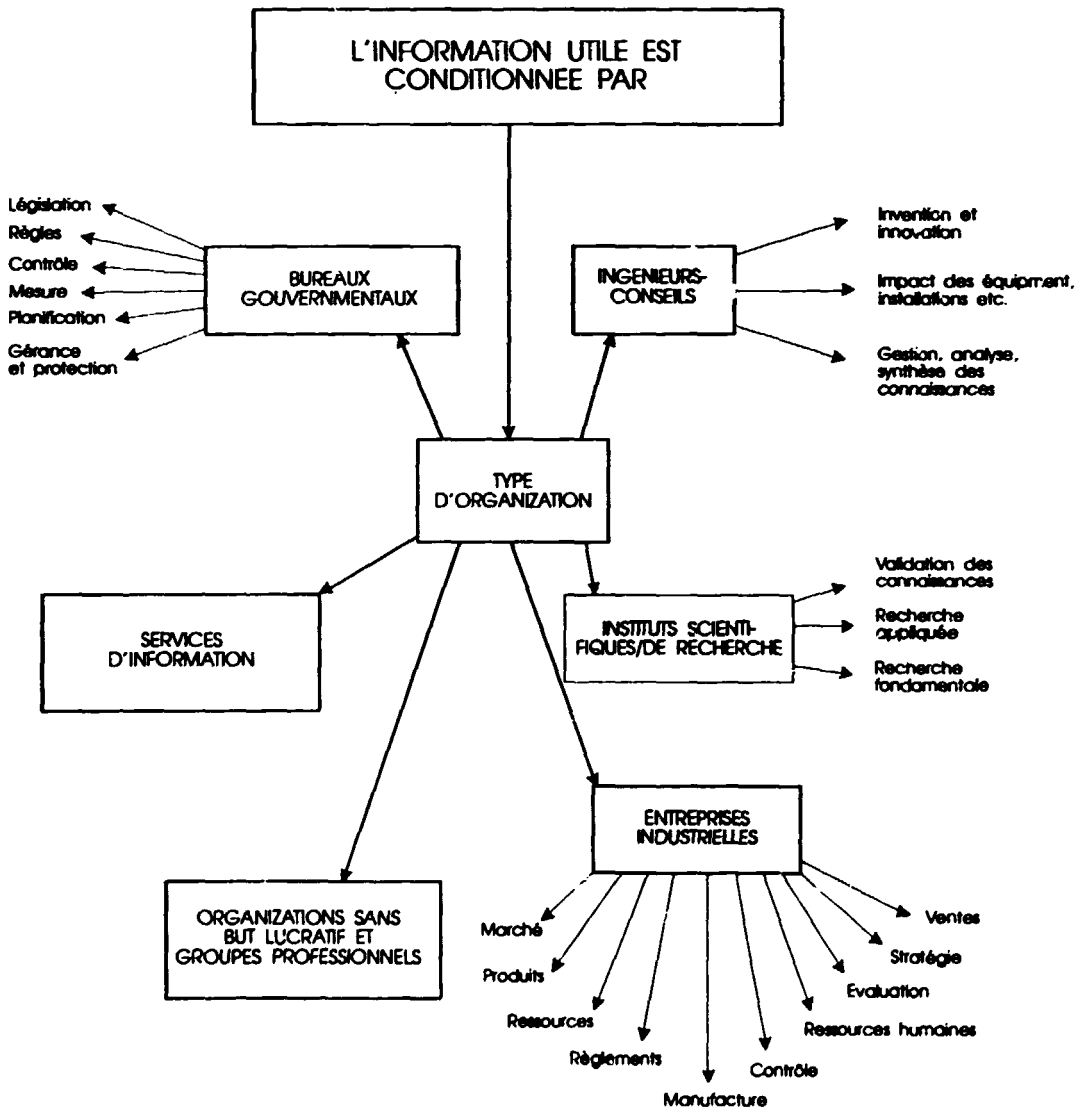


Figure 3 Categories des organisations et leurs activités



- L'offre d'une information (par un service, une personne ou un organisme);
- Le transfert de l'information rendue disponible entre l'organisme demandeur et l'organisme fournisseur des informations.

## 2. QUELLE EST L'ORGANISATION CONCERNEE?

Les actions que nous venons de présenter concernent les entreprises, les administrations, les instituts de recherche, ainsi que les établissements d'enseignement ou d'information. Ces différentes organisations ayant des vocations différentes, leurs préoccupations et leurs approches pour protéger l'environnement ne se posent ni de la même façon, ni dans les mêmes conditions.

La solution du problème à résoudre passe donc par l'analyse de la situation qu'occupe l'environnement dans les objectifs de l'organisme pour lequel l'action est menée ou auquel un problème se pose.

Ces éléments influent sur les besoins en informations, c'est-à-dire sur la nature des informations utiles au cas considéré ainsi que sur les conditions de collecte et d'exploitation (ces conditions sont exposées au chapitre II).

Pour guider l'ingénieur à les déterminer dans son propre cas, nous commentons sommairement ci-dessous, pour chacun de ces organismes, l'essentiel de leurs préoccupations pour protéger l'environnement (figure 3).

### 2.1 ADMINISTRATIONS

Leur fonction est d'assurer une protection ou un service aux citoyens du pays et aux entreprises. L'Administration publique est responsable, dans l'intérêt commun, de la surveillance et de la protection de l'environnement ainsi que de la qualité de la vie des populations.

Les critères de choix des informations recherchées sont liés au service à assurer et aux espaces administrés (international, national, régional, local, etc.).

Les services à assurer, exposés au paragraphe précédent, font partie des objectifs essentiels de l'administration. Il s'agit, plus précisément - des législations, réglementations, contrôles, mesures,

de l'aménagement de l'espace, de la gestion des ressources naturelles, de la protection de la santé des populations, etc.

Les besoins en information pour ces différentes actions sont également prioritaires. En particulier, les budgets affectés seront, en général, plus élevés que dans le cas d'une entreprise.

Les espaces administrés varient entre l'échelle locale et l'échelle internationale. Il s'ensuit que les budgets, les informations à collecter, les moyens de leur diffusion, varient selon la même échelle, comme l'illustrent les deux exemples suivants.

**Exemple N° 1:** Un ministère de l'environnement souhaite installer des équipements de contrôle des émissions de SO<sub>2</sub> et NO<sub>x</sub> provenant des centrales thermiques du pays afin de vérifier si les procédés utilisés permettent de se conformer aux nouvelles normes requises par la loi. Il a besoin, pour cela, de connaître l'éventail des procédés de contrôle des émissions et des procédés de désulfuration et de dénitrification des émissions, ce besoin porte tant sur les caractéristiques des procédés que sur leurs coûts et les caractéristiques de mise en oeuvre et de maintenance.

**Exemple N° 2:** Un organisme public doit rapidement autoriser la construction d'une usine de recyclage de papier. Il a besoin d'informations sur les procédés de recyclage du papier ainsi que sur les impacts sur l'environnement de telles usines.

### 2.2 ENTREPRISES INDUSTRIELLES (PRODUCTEURS DE BIENS DE CONSOMMATION ET DE SERVICES)

Les entreprises, ainsi que les concepteurs, bureaux d'études et de développement, sont les acteurs du développement industriel; leur objectif est de produire et de vendre des biens ou des services en faisant du profit. Les coûts, les temps de travail, l'optimisation économique à court, moyen et long terme sont des facteurs essentiels

de la production et de la rentabilité – ils ont une incidence directe sur les informations à rechercher. C'est ainsi que la protection de l'environnement a une incidence sur le prix du produit vendu et, par suite, sur le marché. Fabriquer un produit propre a une conséquence directe sur sa distribution. Un compromis est à définir entre le marché et le prix de revient du produit propre, tant en ce qui concerne sa fabrication que son utilisation. Des informations spécifiques sont essentielles pour établir ce compromis.

Les problèmes à résoudre en matière d'environnement sont liés aux actions principales de l'entreprise: connaissance du marché national ou international; innovation et conception d'un produit; utilisation des matières premières; respect d'une réglementation internationale; procédé de fabrication d'un produit; contrôle qualitatif et quantitatif des produits, des procédés; ressources humaines; maintien et développement des compétences; évaluation des résultats; élaboration de la stratégie; vente des produits et des services.

La protection de l'environnement peut se poser dans chacune de ces actions:

- Quelles sont les réglementations dans les zones d'implantation des usines et dans leur enceinte? Comment les appliquer?
- Comment concevoir un produit propre et compétitif sur les marchés visés?
- Comment prévenir les risques de pollution résultant de la fabrication, puis de la distribution et de l'utilisation d'un produit?
- Comment mesurer, contrôler, réduire les rejets et les émissions d'une installation industrielle?
- Quels sont les coûts et les gains que l'on peut attendre de l'introduction de procédés non polluants ou de l'installation de circuits de dépollution ou de réutilisation?
- Quels sont les effets économiques d'une évaluation des risques, pour une meilleure prévention des accidents industriels?

Les informations nécessaires pour répondre à ces questions sont spécifiques à chaque cas; pour tous les cas, elles sont complexes et impliquent de prendre en considération les objectifs essentiels de l'entreprise concernée, comme l'illustrent les exemples suivants:

**Exemple N° 1:** Une entreprise de destruction de déchets toxiques a développé un nouveau procédé (propre) de destruction des PCB dans les huiles usagées. Elle a acquis le brevet mondial exclusif de ce procédé. Elle souhaite alors accroître le marché spécifique pour ce produit et installer un réseau de vente; elle cherche des informations sur: l'extension des problèmes d'environnement liés aux PCB dans certaines parties du monde où elle voudrait s'implanter; les législations concernant les procédés chimiques lors de l'immersion en mer d'huiles contaminées par les PCB; la classification internationale des huiles contenant des PCB, concernant leur toxicité, le droit de transport international et de stockage; les données par pays des quantités d'huiles contaminées, etc.

**Exemple N° 2:** Un producteur d'acier souhaite protéger la santé des ouvriers travaillant dans son usine. Pour ce faire, il envisage d'établir un service de mesure et de contrôle des pollutions liées aux poussières et gaz émis et rejetés dans l'atmosphère à l'intérieur et à l'extérieur de l'établissement et dans le système aquatique proche. Il recherche donc des informations sur les procédés de contrôle de pollutions de l'air et de l'eau et sur les programmes de formation du personnel pouvant aider à la mise en place du service envisagé.

**Exemple N° 3:** Une corporation industrielle ayant décidé d'utiliser les déchets de l'industrie du pin pour produire des teintures cherche des informations sur les technologies appropriées, sachant que le dérivé polyphénolique produit en grande quantité par cette activité et utilisable comme teinture peut aussi, combiné, polymérisé et durci avec d'autres produits, être utilisé comme liant et colle dans la fabrication de bois aggloméré.

### 2.3 BUREAUX D'ETUDES

Situés en amont du développement industriel, ils conçoivent, étudient, préparent, font réaliser des infrastructures, des installations industrielles, des bâtiments, des produits, etc.

Dans chacun de ces projets, le souci de la protection de l'environnement s'impose et se traduit différemment pour chacun. Les préoccupations des bureaux d'études rejoignent celles de l'entreprise, avec cette différence qu'il leur faut prendre davantage en considération le futur et qu'ils se trouvent constamment confrontés à des cas particuliers.

Ces organismes sont confrontés à des problèmes d'environnement portant, par exemple, sur:

- Le développement et la diffusion de nouveaux procédés "propres", de nouvelles technologies ou de nouveaux produits;
- Les impacts des infrastructures, des équipements, des installations sur les milieux (certains projets de développement sont assortis de contraintes d'études d'impacts sur les milieux et les populations);
- La mise au point de dossiers portant sur la situation actuelle et le système de prévision pour les impacts possibles du développement sous toutes ses formes.

Les critères de choix des informations recherchées sont les mêmes que ceux retenus par les instituts et centres de recherche, mais:

- La prise en compte des coûts et des délais est plus aiguë dans leurs services, où elle peut devenir un critère de choix fondamental;
- Les indicateurs retenus doivent être minutieusement choisis au regard de l'objectif de l'étude entreprise, pour des raisons de rentabilité rapide et maximale.

### 2.4 INSTITUTS DE RECHERCHE SCIENTIFIQUE FONDAMENTALE OU APPLIQUEE

Leur objectif est d'acquérir des connaissances, ou bien d'en transposer d'un secteur à un autre ou d'un type d'application à un autre, et l'information est à la base de leur activité. Le budget et le temps qui lui sont consacrés sont importants.

Les informations dont ces organismes peuvent avoir besoin portent, par exemple, sur:

- La collecte, l'approfondissement, la mise au point et la gestion des connaissances sur les relations entre les éléments des milieux naturels et les différents aspects de l'activité humaine;
- La recherche fondamentale en physique, chimie, biologie, etc., appliquée aux rapports entre les produits, matériaux (métaux lourds, produits chimiques, etc.) et les tissus des organismes (végétaux, animaux) vivant dans l'air, le sol ou l'eau, dans le contexte de la chaîne alimentaire;
- Des travaux sur les interactions et les modalités de transferts de polluants et de contaminants entre milieux, etc.

Les critères de choix des informations recherchées sont les suivants:

- La fiabilité et la validité (date la plus récente possible) des données collectées;
- La focalisation de la collecte sur l'objectif visé sans s'éparpiller sur d'autres domaines ou objets (choix délicat dès qu'il s'agit d'environnement et de recherche);

**Exemple N° 1:** Un institut de recherche d'un pays donné doit, pour un contrat, fournir des données quantitatives sur les flux et les processus de pollution des réserves en eau potable à partir des déchets d'une mine d'étain. Il recherche alors toute étude ayant été réalisée sur le thème des effets sur l'environnement produits par les déchets des mines d'étain, éventuellement dans un autre pays.

**Exemple N° 2:** Un autre institut de recherche spécialisé dans les études se rapportant aux industries de la cellulose — qui le financent — cherche des informations relatives aux technologies permettant de résoudre un problème de pollution donné posé par une usine de fabrication d'alcool. L'objectif est de réduire les rejets polluants spécifiques.

- L'exhaustivité aussi grande que possible des

informations utiles et exploitables;

- L'obtention de contacts (personnels, le plus souvent) susceptibles d'insuffler un dynamisme productif et continu à la recherche entreprise.

Parfois, les thèmes de recherche sont relatifs à un cas problématique précis qui leur est soumis et auquel ils ne peuvent, seuls, faire face.

## 2.5 SERVICES D'INFORMATION ET DE TRANSMISSION DES CONNAISSANCES

### *Services de documentation*

Il s'agit pour eux de constituer un fonds documentaire, de le gérer, d'améliorer son fonctionnement, d'étendre les domaines d'intérêt, de communiquer avec des demandeurs d'informations dans un objectif précis, etc.

### *Etablissements chargés d'informer ou d'enseigner*

Leur activité de transmission des connaissances nécessite une bonne disponibilité d'informations actualisées, souples dans leur manipulation, accessibles et facilement synthétisables.

### *Organisateurs de congrès, réunions, expositions*

Qu'il s'agisse de municipalités, d'administrations nationales ou internationales, de musées, etc., une réunion ou une exposition thématique repose sur l'accumulation et le choix préalables d'informations complètes et à jour.

Le choix des informations dépendra des services à offrir. Parfois, par exemple:

- Les contacts avec l'extérieur en vue d'obtenir les informations souhaitées sont prépondérants. Le recensement des sources d'informations susceptibles de fournir les informations utiles est une condition préalable au travail;
- Des dossiers thématiques doivent être constitués et gérés de façon à pouvoir trouver rapidement les informations nécessaires;
- La définition des informations, les modalités de fourniture aux utilisateurs, les processus et les moyens de travail, les coûts, etc., en un mot les thèmes qui font ici l'objet de l'analyse du besoin d'informations par la méthode proposée, sont particulièrement privilégiés, qu'il s'agisse de créer des moyens d'information ou de fixer des priorités pour informer.

## 2.6 ASSOCIATIONS A BUT NON LUCRATIF ET GROUPEMENTS PROFESSIONNELS

Ces associations ont des activités, dans le domaine de l'information, dont les conditions et modalités recouvrent celles des organismes précédents. Le prix à payer est fonction du budget et des objectifs de l'association pour informer.

Le choix des informations à diffuser est fonction de la politique de l'association, des préoccupations de ses membres, de son souci de favoriser les contacts entre membres et, enfin, de son fonctionnement.

## 3. QUELLE EST LA SITUATION DU PAYS?

Les besoins en informations sur l'environnement sont ressentis dans tous les pays, dans tous les organismes en rapport, de près ou de loin, avec les activités industrielles. En matière d'environnement, l'action d'un organisme, quel qu'il soit, ne peut être détachée de son cadre socio-économique général (figure 4), car la nature du besoin et les moyens d'information, comme l'objectif des actions, varient tout autant que les conditions dans lesquelles est éprouvé ce besoin.

Selon l'âge de l'industrialisation d'un pays, selon la place qu'occupe le développement industriel dans l'ensemble de sa politique de développement, selon les options concernant l'environnement qui s'inscrivent dans cette politique, les besoins d'information sur l'environnement seront différents. Les moyens de se procurer les informations utiles le sont aussi.

En effet, le stade, l'âge, la situation et l'état d'avancement du développement industriel influent directement sur l'expérience industrielle (procédés et technologies propres par exemple) et le cadre de réglementations environnementales sur lesquels les organismes concernés devront s'appuyer; ils influent aussi sur l'existence de relations privilégiées avec, d'une part, les groupements industriels dans le pays, et à l'étranger (détention de brevets, transferts de technologies, stages de formation, etc.) et, d'autre part, des sources d'information variées.

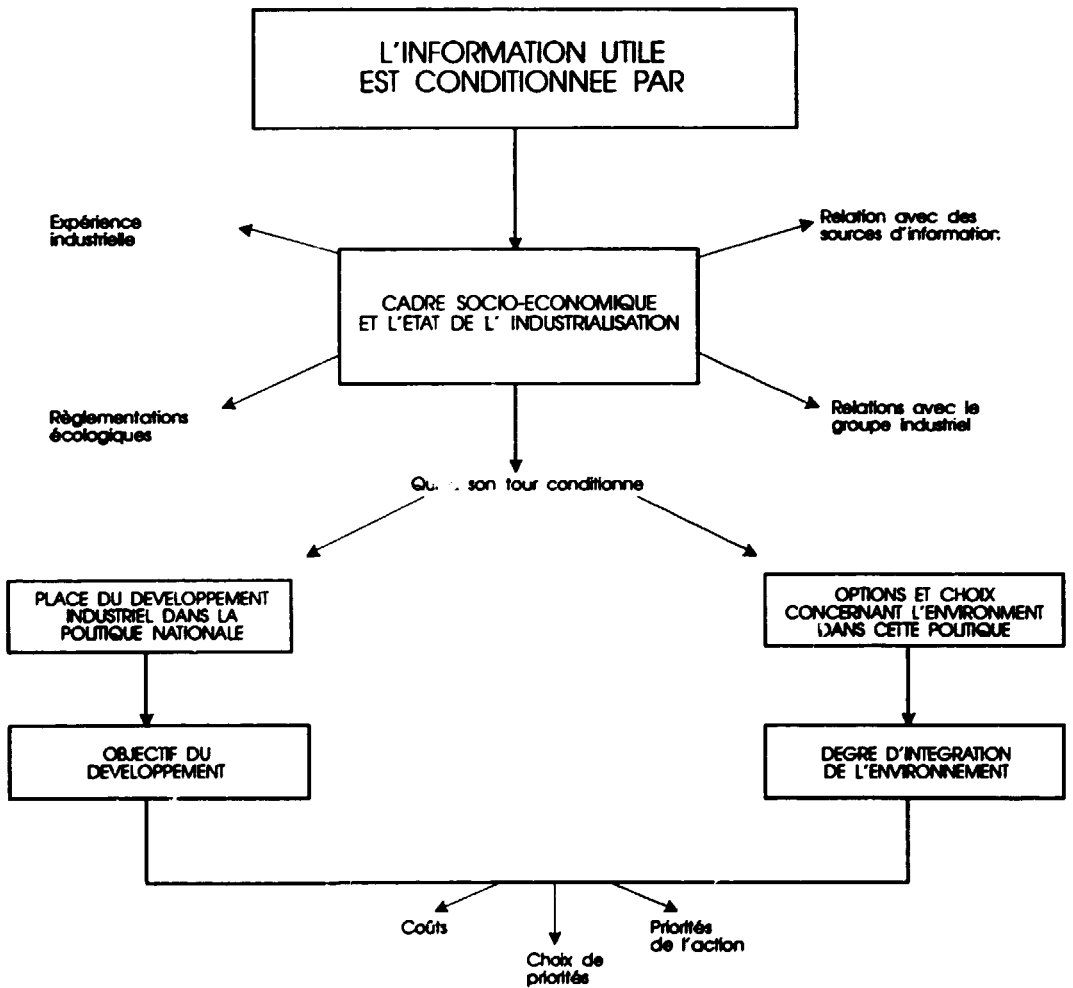


Figure 4 Etat de l'industrialisation et exigences pour l'information sur l'environnement

Plus un pays sera industrialisé, plus ses possibilités d'accès (en temps et en coûts) à l'information sur l'environnement seront multiples et faciles.

Les problèmes (y compris ceux d'ordre financier) et les préoccupations (y compris les priorités et les critères de choix) relatifs à l'environnement, aux technologies et aux innovations, aux mesures, contrôles, prévention, réduction des pollutions, à l'organisation et à la croissance spécifique de l'industrie de l'environnement, etc., varient selon le stade de développement industriel du pays.

La nature et surtout les sources et les origines des informations utiles différeront en fonction de ces caractéristiques.

Les informations utiles dépendront:

- De la nature et de l'importance des secteurs industriels;
- Des objectifs de développement et du degré d'intégration de l'environnement dans la planification économique et territoriale;
- Des priorités d'action, en fonction des priorités de développement et des choix (quels qu'en

soient les fondements) entre des objectifs à court ou à plus long terme (ces derniers favorisant la prise en compte de l'environnement dans les décisions).

De ces objectifs, choix et priorités dépendront les caractéristiques des informations utiles à obtenir et les modalités de collecte et de diffusion; ils sont donc un élément important lors de l'analyse et de la définition des besoins pour le choix des fournisseurs d'informations. Par exemple:

- Un organisme situé dans un pays industrialisé aura besoin, plus souvent, d'informations sur: les marchés—les brevets, la législation et les réglementations, etc.;
- Un organisme situé dans un pays en cours d'industrialisation aura besoin, plus souvent, d'informations sur les procédés (de fabrication, de réduction ou prévention des pollutions, de contrôle et de mesure des rejets ...), leur coût, les normes environnementales dans les autres pays, les impacts d'une usine projetée.

**“Il est impossible de transposer systématiquement d'un pays à un autre une analyse des besoins d'informations, fussent-ils pour une même catégorie d'ingénieurs travaillant dans le même type d'organisme. La nature, les sources, les origines des informations utiles diffèrent en fonction du niveau de développement des pays, de même que les modalités de collecte et de diffusion de l'information.”\***

\*D'après "Approche méthodologique pour identifier les besoins en information des ingénieurs" (version provisoire). UNISIST, UNESCO, 1984, p.11.

# CHAPITRE 2

## DEMARCHE A SUIVRE

### PRINCIPE DE LA DEMARCHE

Nous avons mis en évidence au chapitre précédent:

- La variété des actions et des situations auxquelles un ingénieur peut se trouver confronté pour protéger l'environnement;
- Le processus pour diagnostiquer chaque cas, en s'appuyant de schémas types, un tel diagnostic précédant nécessairement la recherche d'informations et la conditionnant;
- Les conséquences sur les conditions pour s'informer de l'importance de l'action envisagée pour l'organisation concernée, ainsi que sur la situation du pays (figure 5).

### SAVOIR CE QUE L'ON VEUT

Analyser l'action envisagée ou le problème à résoudre. Cette analyse a été expliquée au chapitre 1.

Elle permet de déterminer:

- Le but visé avec les informations à rechercher;
- Le contexte dans lequel ces informations seront exploitées;
- Les conditions pour s'informer: délais d'obtention, coût possible, quantité d'informations à recueillir, degré de précision nécessaire. Ces conditions guident dans le choix des moyens d'information permettant le meilleur rapport qualité/prix pour ce que l'on veut faire;
- Les priorités dans la recherche de ces informations.

### DETERMINER LES CARACTERISTIQUES DES INFORMATIONS A RECHERCHER IDENTIFIER LES SOURCES D'INFORMATIONS

La connaissance précise du but visé par les informations et du contexte dans lequel elles serviront

permet de (figure 6):

- Déterminer le sujet des informations, leur contenu, sur quoi elles portent, c'est-à-dire le domaine d'intérêt auquel elles se rapportent, et pour chacun l'objet même de l'information à rechercher;
- Préciser leur nature: scientifique, technique, économique, juridique, géographique;
- Limiter leur antériorité: jusqu'à quelle date il est utile de remonter dans la recherche;
- Choisir leur provenance: dans l'organisation concernée, dans son pays, de l'étranger.

Les informations utiles au but visé, ainsi caractérisées, se trouvent dans des documents (au sens large du terme) ou sources d'information, de natures variées et spécifiques au cas considéré.

L'analyse de l'action envisagée et l'identification des informations utiles permet de:

- Sélectionner, parmi les sources d'information possibles, celles dans lesquelles les informations à rechercher ont la plus grande probabilité de se trouver;
- Distinguer dans chaque cas trois catégories de documents (ou sources) - les documents propres à l'organisation, les documents provenant de son pays, les documents provenant de l'étranger.

### CHOISIR LES MOYENS POUR OBTENIR LES INFORMATIONS RECHERCHEES

La définition des caractéristiques des informations à rechercher, la sélection des supports préférentiels à exploiter pour les trouver, ainsi que la détermination des conditions pour les obtenir, permettent de:

- Sélectionner, parmi les organisations qui fournissent des informations à des tiers, celles qui sont susceptibles de fournir ce que l'on veut (informations et documents) aux conditions désirées;
- Choisir, pour consulter ces organisations, les

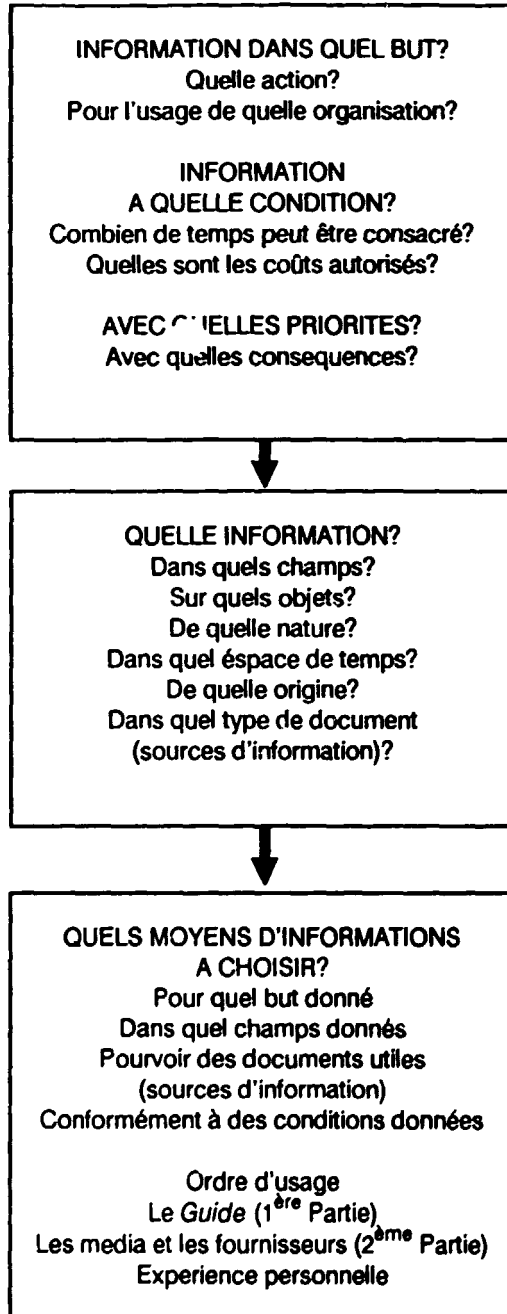


Figure 5 Principes régissant le processus de demande d'information



## Information...mais pas n'importe laquelle

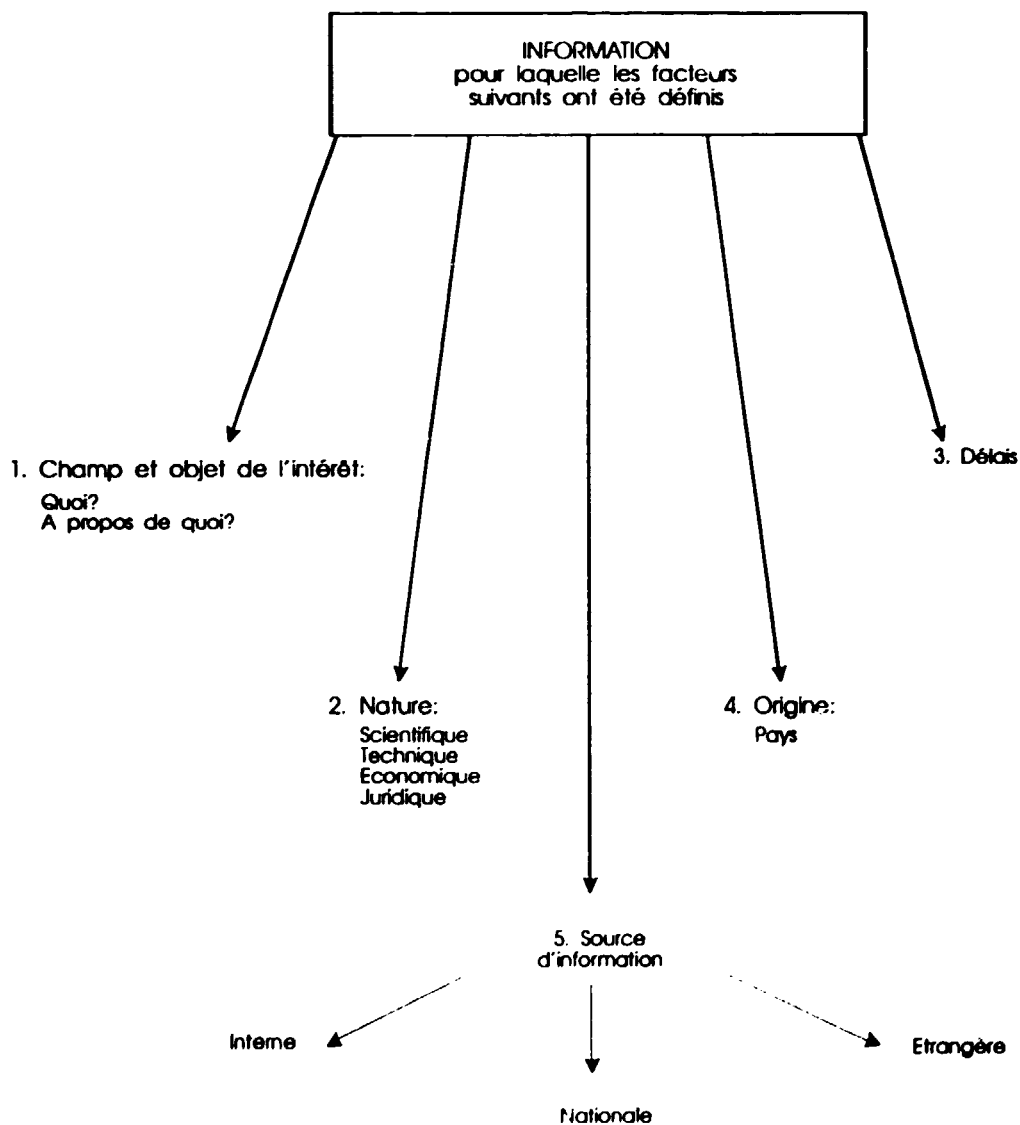


Figure 6 Caractéristiques de l'information utile

modalités qui conviennent aux conditions fixées (moyens informatiques, transmissions électroniques, voie postale, voie orale, etc.).

Il s'agit là de la même démarche que celle suivie pour trouver un produit, un matériel, un procédé ou un équipement. Pour cette raison, nous désignerons par "fournisseurs d'informations" les organismes qui fournissent des informations à des tiers (centre d'information, bibliothèque, centre

de presse, centre de documentation, serveur de banques de données, etc.).

En nous fondant sur ce principe, et en suivant les indications du chapitre 1, nous expliquons comment procéder. Afin de faciliter la démarche, d'assurer la rigueur nécessaire et de procéder rapidement, nous proposons, pour chaque étape, les éventualités parmi lesquelles il suffit de choisir.

### Qu'entend-on par "moyen d'information" ?

Une organisation qui collecte et exploite des sources d'informations en vue de faciliter la fourniture d'informations à des tiers.

Cette fourniture est faite soit directement en répondant à des demandes spécifiques, soit par des produits tels que bulletins périodiques, banques de données, bibliographies, synthèses, etc.

Pour les raisons indiquées dans le principe de la démarche, et par simplification, nous désignons ces organismes par "Fournisseurs d'informations".

La sélection est fonction des caractéristiques propres à l'organisme:

- l'objectif - à quelle clientèle s'adressent-ils? Quelle est leur "mission"?
- le domaine d'intérêt des informations collectées;
- la nature des sources d'informations réunies - tels les spécialistes, objets, documents écrits, films, ou encore la nature des informations proprement dites;
- le stade de traitement des sources d'informations réunies;
- leur crédibilité - conditions et qualité de la collecte et du traitement des informations fournies;
- l'origine (géographique) des sources ou des informations collectées;
- du mode de consultation de l'organisation ou des produits qu'elle fournit - voie orale (téléphone, visite, etc.), voie postale, moyens informatiques (consultation de banques de données, messageries électroniques, etc.), transmissions électroniques diverses (par exemple par télex, téléconférence ou télécopieur).

Le choix final dépend du coût possible pour les informations que l'on peut obtenir, des délais souhaités, du travail complémentaire que nécessitent les informations reçues sous la forme où elles sont fournies, ainsi que de la commodité pour celui qui les consulte.

Nous présentons en annexe 2 au chapitre 2 les

catégories de fournisseurs d'informations, différenciées selon le stade de traitement de la documentation traitée.

Dans la deuxième partie du *Guide*, nous proposons une liste d'organismes qui fournissent des données portant plus particulièrement sur la protection de l'environnement, en indiquant pour chacun, dans la mesure où il a été possible de les obtenir, ses caractéristiques propres.

### Remarque :

Il est à noter qu'un besoin d'informations, du fait de sa complexité, est rarement totalement satisfait par un seul fournisseur d'informations parce que:

- S'il est extérieur à l'organisme de l'utilisateur, il ne dispose pas des informations internes à cet organisme;
- Beaucoup ne font pas appel à des sources vivantes. Or, ces dernières sont, dans de nombreux cas, la source essentielle d'informations à rechercher;
- Les cas étant complexes et spécifiques, ils ne cadrent pas nécessairement avec ceux d'un seul fournisseur.

Aussi, dans la majorité des cas, convient-il de s'adresser à plusieurs "fournisseurs", en empruntant des voies différentes.

Du choix de ces fournisseurs dépendra la fiabilité des informations reçues, l'économie du temps passé à leur utilisation et l'assurance de rester dans les limites du budget possible. Le choix sera d'autant plus efficace:

- Que l'on saura ce que l'on veut et à quelles conditions, objet des phases 1 et 2 de la méthode proposée;
- Que l'on disposera d'un large éventail de fournisseurs d'informations dans de nombreux pays ainsi que dans les organisations internationales. C'est l'objet de la deuxième partie du *Guide*;
- Que l'on opérera le choix de façon à avoir la meilleure fiabilité possible pour les informations requises aux conditions que l'on a fixées.

## PHASE 1: PRÉCISER CE QUE L'ON VEUT—DES INFORMATIONS POUR QUOI FAIRE? A QUELLES CONDITIONS?

Se reporter au chapitre 1.

- Choisir, parmi les cas types d'action, parmi les organisations types, celles qui se rapportent au cas particulier pour lequel les informations sont à rechercher;
- Tenir compte des conditions propres au pays concerné par ce cas, en consultant, au chapitre 1, la section 3;
- Analyser le cas concerné à l'aide du schéma suivant

### 1. QUELLE EST L'ACTION ENVISAGÉE?

#### 1.1 OÙ EN EST-ON?

*Commentaires*

- Décision
- Exploration
- Innovation
- Conception
- Réalisation
- Diffusion

#### 1.2 DE QUOI S'AGIT-IL?

*Commentaires*

- Réglementer les activités et leurs impacts
- Légiférer sur l'environnement
- Légiférer
- Établir des normes
- Mesurer et contrôler
- Établir des séries chiffrées
- Prévenir les problèmes liés à l'environnement
- Assurer l'optimisation économique de l'activité industrielle
- Réduire les pollutions
- Obéir à la réglementation
- Développer de nouveaux marchés
- Transmettre des connaissances
- Enseigner
- Informer
- Autre (à préciser)

## 2. QUELLE EST L'ORGANISATION CONCERNÉE?

*Commentaires*

- Administration (ministère, institut, mairie, etc.)
- Entreprise industrielle
- Bureau d'études et de projets
- Institut de recherche fondamentale et appliquée
- Établissement de formation
- Organisme d'information
- Association à but non lucratif
- Autre (à préciser)

## 3. QUELLES SONT LES CONDITIONS PROPRES AU PAYS CONCERNÉ?

## 4. QUELLES SONT LES CONSÉQUENCES DE L'ACTION ENVISAGÉE?

### 4.1 SUR L'ORGANISATION CONCERNÉE

*Expliciter*

- Pour la politique d'ensemble
- Pour conserver ses marchés
- Pour créer de nouveaux marchés
- Autre (à préciser)

### 4.2 DANS LE PAYS CONCERNÉ

- Pour l'ensemble de l'activité industrielle
- Sur l'opinion publique
- Sur un ensemble de personnes
- Autre (à préciser)

### 4.3 POUR L'INGÉNIEUR OU L'ÉQUIPE RESPONSABLE

## 5. A QUELLES CONDITIONS S'INFORMER?

En fonction des réponses aux quatre questions précédentes, évaluer les conditions suivantes:

- Quand les informations seront-elles utilisées?
- Quel est le délai limite pour en disposer?
- Quel est le coût maximum possible de l'ensemble de la recherche?
- En conséquence, quel est le maximum de temps possible à y consacrer?

- Moins d'une heure?
- Moins d'un jour?
- Moins d'une semaine?
- Plus? (préciser la durée)
- Quelle est la précision des informations souhaitées?

**Remarque**

- Si l'ingénieur effectue la recherche pour une autre personne, à qui sont destinées les informations?

*Commentaires*

- Le responsable de l'action
- Le dirigeant ou les instances dirigeantes de l'organisme
- Un service spécialisé, pour étude, pour documentation
- Un spécialiste de l'environnement
- Un non-spécialiste de l'environnement
- Quelle est leur connaissance de l'environnement?
- Quelles sont les langues de travail possibles?

- Sous quelles formes fournir les informations?
- Documents de première source
- Liste d'adresses ou de références
- Dossier
- Synthèse, rapport

**6. QUELLES SONT LES PRIORITES?**

Le coût possible et le temps possible à consacrer à s'informer limitent nécessairement la satisfaction du besoin. Un compromis est nécessaire entre:

- L'obtention de toutes les informations propres à satisfaire le besoin d'informations;
- Celles de ces informations qu'il sera possible d'obtenir dans les conditions fixées.

Pour cela, des priorités seront à déterminer, qui guideront le choix des informations à recueillir et, par suite, le choix des moyens d'information.

Expliquer, en quelques lignes, ce qui est prioritaire dans l'action à mener ou dans le problème à résoudre.

**Exemple:**

**des informations, pour quoi faire?**

En Inde, le ministère de l'Environnement souhaite réduire les émissions de SO<sub>2</sub> et de NO<sub>x</sub> des centrales thermiques.

**Phase 1**

**1) Où en est-on? Réalisation**

*De quoi s'agit-il?* Gérer l'environnement; mesurer et contrôler; réduire les pollutions; acheter du matériel de réduction et de contrôle des émissions

**2) Quelle est l'organisation concernée? Administration**

**3) Quelles sont les conditions propres au pays?** Pays en cours d'industrialisation, possédant son industrie propre mais désireux d'utiliser les technologies pouvant provenir de l'étranger.

**4) Quelles sont les conséquences?**

**a) Sur l'organisation:**

- Mise en place d'un service d'application et de contrôle des procédés;
- Etude de marché sur les procédés au moindre coût.

**b) Dans le pays concerné:**

- Surcoût des équipements;
- Impact positif sur la population et l'environnement (au niveau national et international).

**5) Quelles sont les conditions?**

- *Délai de disposition des informations mises en forme:* 4 mois.
- *Coût maximum pour la recherche:* à définir (fonction de la décision d'application).
- *Maximum de temps disponible pour la recherche d'informations:* 3 mois.
- *Dossier destiné aux:* instances dirigeantes.
- *Langue de travail:* anglais.
- *Quelle forme?* dossier sur procédés (caractéristiques, origine, coût d'achat, coût d'application, coût de maintenance).

**6) Priorités?**

- Catalogue de procédés classés par coûts/qualité avec objectif de réduire les émissions gazeuses.

**Remarque:** La phase 2 du processus est détaillée ensuite.

## PHASE 2a: CARACTERISER LES INFORMATIONS A RECHERCHER

Consulter l'ensemble des réponses aux questions posées dans la phase 1.

En se guidant sur celles-ci, caractériser les informations à rechercher à l'aide du schéma suivant, en s'appuyant sur la figure 6.

Regrouper les résultats au tableau 2.

### 7. QUELS SONT LES SUJETS DES INFORMATIONS?

Les sujets des informations, c'est-à-dire leur contenu et sur quoi elles portent, sont déterminés par: le domaine auquel elles se rapportent, et, dans un domaine, par l'objet, par ce dont il s'agit; ce que nous formulons par:

#### Exemple

Caractéristiques d'informations à rechercher – phase 2

En Inde, le Ministère de l'environnement souhaite réduire les émissions de SO<sub>2</sub> et NO<sub>x</sub> provenant des centrales thermiques.

Il souhaite connaître:

- a) *Le domaine*: émissions gazeuses
- b) *Les sujets*:  
Sujet 1:  
(b.1) = procédés de désulfuration et de dénitrification des émissions;  
(b.2) = coûts;  
(b.3) = caractéristiques opératoires et de maintenance;  
(b.4) = conséquences en termes d'espace (site).  
Sujet 2:  
(b.5) = systèmes de traitement et d'utilisation des résidus
- c) *La nature*:  
pour b.1 et b.5 – technique;  
pour b.2, b.3 et b.4 – économique.
- d) *L'antériorité*:  
pour b.1 et b.5 – moins de 5 ans;  
pour b.2 et b.3 – moins de 1 an;

- Quoi?;
- Quel domaine?
- Sur quoi?
- Quel objet?

### 7.1 DE QUOI TRAITENT LES INFORMATIONS?

Nous avons montré au chapitre 1 qu'un besoin d'informations implique de réunir des informations sur plusieurs domaines (différents pour chaque cas). Il s'agit généralement de domaines liés à l'environnement et de domaines indépendants de l'environnement.

La figure 7 nous montre un ensemble de grands domaines d'intérêt susceptibles d'être pris en compte dans la recherche d'informations pour la protection de l'environnement.

En s'aidant de ce plan, et à partir des

pour b.4 – plus de 5 ans.

#### • c) *L'origine*:

Interne

e.1 – Services internes du Ministère, chargés de la surveillance des pollutions, et du secteur énergie (pour b.1 à b.4), chargés de la gestion des déchets (pour b.5).

Externe

e.2 – Ministère indien de l'industrie (services chargés de l'exploitation des installations énergétiques) (pour b.1 à b.5);

e.3 – Chambres de commerce indiennes (pour b.1, b.2 et b.5);

e.4 – Industriels indiens et associations professionnelles régionales et nationales (pour b.1, b.4 et b.5).

Etrangère

e.5 – Ambassades étrangères (attachés économiques) (pour b.1 et b.5);

e.6 – Associations professionnelles internationales et organisations internationales (pour b.1, b.2 et b.5);

e.7 – Fabricants (pour b.1 à b.5).

Un choix est à opérer dans les origines à sonder, en fonction de l'importance de l'action entreprise, du sujet et de la nature de l'information souhaitée.

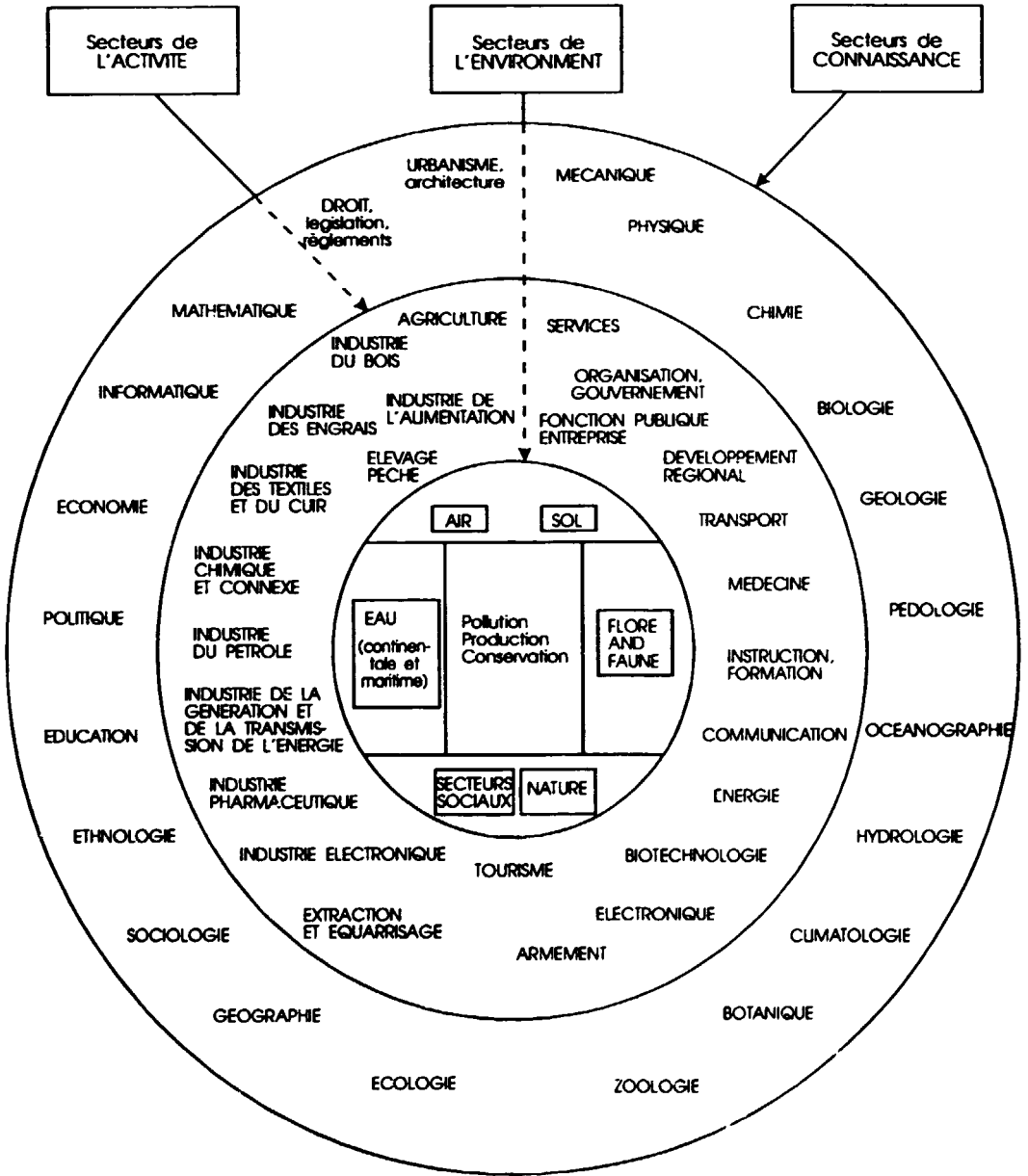


Figure 7 Champs d'intérêt dans la protection de l'environnement

réponses aux questions posées dans la phase 1, préciser ci-dessous les domaines; puis les reporter au tableau 1.

Des informations sur:

*Commentaires*

- Les déchets solides domestiques et/ou industriels
- Les eaux usées domestiques et/ou industrielles
- Les émissions gazeuses
- Les déchets et produits toxiques
- Les métaux lourds
- Les produits chimiques (détergents) (pesticides) (engrais) (autres: à préciser)
- La radioactivité
- Le bruit
- La santé
- L'implantation d'une zone industrielle
- L'aménagement urbain
- Autres (à préciser):

**7.2 A QUOI SE RAPPORTENT LES INFORMATIONS?**

A la figure 8 est réuni un ensemble d'objets relatifs à la protection de l'environnement.

En s'aidant de cette représentation,

- Déterminer, pour chacun des domaines des informations à rechercher, leur objet;
- Le reporter au tableau 1.

**7.3 QUEL EST L'ORDRE DE PRIORITÉ DES INFORMATIONS À RECHERCHER ?**

En fonction des priorités dans l'action à mener, telles qu'elles ont été définies à la phase précédente (point 6), indiquer au tableau 1 l'ordre de priorité des informations à rechercher.

**7.4 QUELLE EST LA NATURE DES INFORMATIONS RETENUES?**

Préciser, au tableau 1, pour chacune des informations, leur nature: scientifique, technique, économique, juridique, etc. Ce caractère guide dans le choix des fournisseurs, qui se différencient souvent par la nature des informations qu'ils traitent.

**8. QUELLE EST L'ANTÉRIORITÉ?**

Compte tenu de l'objectif visé, l'antériorité des informations à rechercher doit être spécifiée.

Si nécessaire, le préciser pour chacun des sujets.

*Sujet des informations*

- Des informations de moins d'un an d'antériorité?
- Des informations de moins de 2 ans d'antériorité ?
- Des informations de moins de 5 ans d'antériorité ?
- Des informations de plus de 5 ans d'antériorité? (à préciser)

**9. QUELLE EST L'ORIGINE?**

Nous avons montré au chapitre 1 que les informations à réunir ont nécessairement plusieurs origines, internes et externes, variant selon ce que l'on veut en faire; ces origines sont à préciser dans chaque cas.

En s'appuyant sur la phase 1, préciser les informations à rechercher:

- *Provenant de l'organisation commandant la recherche*  
Quelles informations? (à préciser);
- *Provenant du pays de l'organisation concernée*  
Quelles informations? (à préciser);
- *Provenant de pays étrangers*  
Quels pays? (à préciser)  
Quelles informations? (à préciser).

Regrouper les résultats de 6, 7, 8 et 9 au tableau 2.

**PHASE 2b: IDENTIFIER LES SOURCES DES INFORMATIONS A RECHERCHER**

Les sources d'informations désignent tous les types de supports qui contiennent des informations susceptibles d'être communiquées: ce peut être une personne, lorsqu'elle communique son savoir, un objet, une image, un disque ou une cassette, un ouvrage, ou tout autre document écrit ou imprimé.

Nous donnons en Annexe 1 au présent chapitre



une explication succincte des destinations essentielles des différentes catégories de documents.

Quelles sont les meilleures sources susceptibles de contenir les informations à rechercher, pour l'usage que l'on veut en faire?

Il s'agit par là de préciser dans quels supports les informations que l'on recherche ont la plus grande probabilité de se trouver.

#### **Pourquoi opérer un tel choix, avant la recherche proprement dite?**

Une même connaissance est susceptible d'être consignée dans de nombreux types de supports (désignés ici comme "sources"), dont le nombre croît avec l'extension des technologies de l'information amenant sur le marché disques, disquettes, bandes magnétiques, journaux électroniques, etc.

Dans chacun de ces supports, les informations relatives à cette connaissance n'ont pas les mêmes

#### **Exemple:**

En reprenant l'exemple précédent d'une demande d'informations sur les coûts d'installation et de maintenance des procédés de désulfuration et de dénitrification des émissions, en ce qui concerne leur efficacité (c'est-à-dire leur conformité aux normes retenues), et sur les systèmes de traitement et d'utilisation des résidus de ces procédés, les informations nécessaires peuvent être contenues:

- Dans des catalogues — source interne (si le catalogue existe dans les services du ministère demandeur), source externe (si le catalogue est à chercher auprès d'un autre organisme sur le territoire national), ou étrangère (si le catalogue doit être obtenu d'une organisation étrangère). Cela ne préjuge pas la couverture géographique (nationale ou internationale) du catalogue en question.
- Selon les catalogues, il est possible d'obtenir la

caractéristiques parce qu'elles sont destinées à des objectifs différents. Il s'agit par conséquent de sélectionner les catégories de documents dont la destination est en rapport avec celle des informations à rechercher.

Le choix des supports d'information conditionne l'obtention d'informations fiables pour le but visé en évitant un gaspillage du temps consacré à leur recherche.

#### **Comment procéder?**

- Se reporter à l'Annexe 1;
- Regrouper au tableau 3 les éléments consignés sur le tableau 2;
- Pour chacun des sujets d'information, et en se guidant sur les résultats de la phase 1, sélectionner les supports de ces informations. Les indiquer sur le tableau 3;
- En préciser l'origine à l'aide du tableau 2;
- S'aider de l'exemple ci-après.

liste des fournisseurs, les types disponibles, éventuellement leur prix, leurs caractéristiques techniques et de maintenance (qui sont plus généralement obtenus auprès des fabricants), etc.;

- Dans des ouvrages et des périodiques (pour leur analyse technique);
- Dans des brevets (pour connaître ceux qui possèdent le savoir-faire et, éventuellement, la distribution);
- Dans des rapports et études (internes, externes et disponibles auprès des fournisseurs) pour connaître leurs conséquences en termes d'espace, leur efficacité de fonctionnement dans l'environnement et pour une situation spécifique;
- Auprès de sources vivantes (foires, organisations internationales, associations professionnelles nationales et internationales) pour avis d'experts, etc.

## PHASE 3: CHOISIR LES MOYENS D'INFORMATION A UTILISER

Se guider sur les commentaires du paragraphe 3.

- Reprendre le tableau 3, tel qu'il a été rempli dans la phase 2 b;
- Reprendre les conditions de fourniture préalablement fixées (phase 1, paragraphe 5), relatives aux délais, au coût total possible, au temps possible à consacrer et à la précision souhaitée des informations;
- Suivre l'ordre de priorité de recherche en procédant comme suit.

### 10. QUELS MOYENS SELECTIONNER ET CHOISIR?

#### 10.1 RECHERCHER DANS L'ORGANISME MEME DE L'INGENIEUR CONCERNE:

- Les sources d'information internes identifiées sur le tableau;
- Les sources d'information externes susceptibles de s'y trouver, en particulier si l'organisme dispose d'un service de documentation;
- Les pointer sur le tableau.

Veiller à n'y consacrer que le temps compatible avec la priorité de l'information recherchée et avec le temps total possible pour rechercher l'ensemble des informations.

#### 10.2 RECHERCHER DANS LE PROPRE PAYS DE L'ORGANISME CONCERNE:

- Les fournisseurs d'information qui couvrent le ou les sujets des informations à rechercher;
- Parmi ceux-ci, sélectionner ceux qui exploitent les sources d'information identifiées sur le tableau;
- Préciser pour ces derniers
  - l'objectif
  - ce qu'ils font
  - le moyen de les consulter
  - les conditions pour obtenir les informations: coût, et stade de traitement de la documentation
  - la crédibilité;
- Retenir pour les consulter ceux qui se rapprochent le plus de ce que l'on veut;

- Pointer sur le tableau ce qu'il est possible d'obtenir auprès de ces organisations-là.

La recherche des fournisseurs possibles s'effectue par:

- La consultation de la deuxième partie du *Guide*
  - La consultation des répertoires
  - Sa propre expérience ou celle de collègues.

#### 10.3 FAIRE LE POINT

Il est nécessaire de faire le point:

- Des informations susceptibles d'être obtenues sur place et dans le pays;
- Du coût et des délais possibles pour les obtenir;
- Des priorités qu'il est possible de satisfaire;
- Des lacunes par ordre de priorité;
- Il faut aussi évaluer, en se référant aux conditions fixées:
  - Les fournisseurs qu'il est justifié de consulter
  - La nécessité ou l'inutilité de rechercher d'autres fournisseurs.

#### 10.4 RECHERCHER D'AUTRES FOURNISSEURS D'INFORMATION

Dans le cas où il s'avère nécessaire de consulter d'autres organismes d'information:

- Rechercher d'abord auprès des organisations internationales en suivant une démarche identique à celle proposée pour les fournisseurs nationaux d'information (point 10.2 ci-dessus);
- Faire le point comme précédemment (point 10.3 ci-dessus);
- S'il s'avère nécessaire, rechercher de la même façon des fournisseurs d'information dans des pays étrangers, choisis en fonction de l'origine des sources des informations à obtenir;

La recherche de ces organisations s'effectue de la même façon que pour les "fournisseurs nationaux d'information" (point 10.2 ci-dessus).

### 11. COMMENT CONSULTER LES FOURNISSEURS D'INFORMATION CHOISIS ?

#### 11.1 DRESSER LA LISTE DES ORGANISMES A CONSULTER

Se reporter au tableau 3 et, pour chaque organisme, indiquer:

- Les informations attendues;
- Les sources d'information traitée;

- Le mode de consultation retenu;
- Le délai possible;
- L'adresse géographique et postale;
- La date de consultation.

### **11.2 CONSULTER CHACUN DES ORGANISMES**

A cette fin, il convient de préciser:

- Ce que l'on veut, c'est-à-dire ce pourquoi l'on recherche des informations;

- Les informations attendues et les sources recherchées;
- Les informations dont on dispose déjà;
- Les précisions souhaitées;
- Les délais possibles;
- La manière de s'entendre sur les coûts.

### **11.3. CONTROLER L'ARRIVEE DES REPONSES**

Reporter les résultats du 7 à la table 1

SUJET	CHAMP												
	Décrets solides	Emissions gazeuses	Substances toxiques	Produits chimiques	- détergents	- pesticides	- engrais	- autres	Métaux lourds	Radioactivité	Bruits	Santé	...
Législation Régulation Normes	b	3											
Impact sur l'environnement Problèmes de site	b	2-3											
Analyse de la situation Données numériques	a-b c	3											
Technologie de mesure et de contrôle		3											
Procédés d'élimination des déchets et effluents	a-b c	3											
Procédés de fabrication													
Produits													
Equipements et matériels	a-b												
Coûts Marchés	a-b c	1-3											
Perfectionnement économique													
Recyclage	c												
Contacts													
Cours de formation													
Statistiques													
...													

Les exemples employés sont comme suit:

- a création d'un service municipal pour le ramassage des ordures
- b choix d'un système pour le traitement des déchets municipaux solides
- c création d'un système sélectif pour le ramassage des ordures (ou pour leur traitement collectif) pour le recouvrement et le recyclage des déchets solides
- 1 coût d'une installation pour le traitement des eaux usées
- 2 localisation d'une installation pour le traitement des eaux usées
- 3 choix d'une installation pour le traitement des eaux usées

Table 1 Phase 1: Information à chercher

PRIORITE DE LA RECHERCHE	SUJETS				PERIODE		ORIGINE															
					Dans le pays		A l'étranger		Organisation internationale													
					Interne	Externe	Quels pays															
	> 1 an	1 < 2 ans	2 < 3 ans	3 < 5 ans																		

Table 2 Phase 2a: Caracteristiques de l'information cherchée



# ANNEXE 1

## CHOISIR LE SUPPORT DE L'INFORMATION en fonction de l'objectif visé

### Un livre?

Pour apprendre la base de la technique  
Pour apprendre l'impact des déchets avec ou sans filtres

### Un périodique?

Pour se maintenir à jour sur les nouveaux produits, procédés, concurrents, etc.

### Un rapport?

Pour apprendre les perfectionnements en matière d'économie, de circuits ou de résultats concernant l'introduction d'un nouveau matériau sur le marché du filtre où j'adresse mes exportations

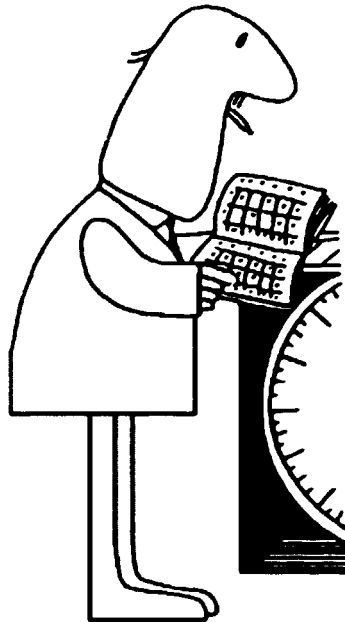
### Un texte statut?

Pour apprendre ce qui doit être respecté dans le domaine de la sécurité et du contrôle

### Un standard?

Pour apprendre les spécifications ou les dimensions des matériels  
Pour apprendre les limites imposées en termes de quantité ou de durée pour un déchet donné

*Quel est le meilleur choix de filtres dans mon cas?*



### Une patente?

Pour apprendre une nouvelle invention et pour savoir si je peux breveter une nouvelle amélioration

### Un catalogue de fournisseurs?

Pour se renseigner sur les modèles disponibles sur le marché, leurs caractéristiques, capacité et prix

### Une banque de données numérique?

Pour calculer certaines caractéristiques ou évaluer le marché

### Un échantillon?

Pour savoir comment le modèle est projeté

### Un spécialiste?

Pour conseiller sur le choix du filtre et son installation dans des conditions spécifiques

### Un programme?

Pour aider à calculer et à projeter un nouveau filtre

Source: adapté de "La gestion de l'information dans l'entreprise", A. DAVID & E. SUTTER, AFNOR, Ed. AYOULLES, 1985, p. 64.

## ANNEXE 2

### CATEGORIES DE "FOURNISSEURS D'INFORMATIONS"

Nous les distinguerons, selon leur vocation, en quatre catégories, représentées sur la figure 9 ci-dessous:

- Les services de l'organisation où travaille l'ingénieur;
- Les groupements avec lesquels travaille son organisation;
- Les fournisseurs d'informations proprement dits;
- Les administrations.

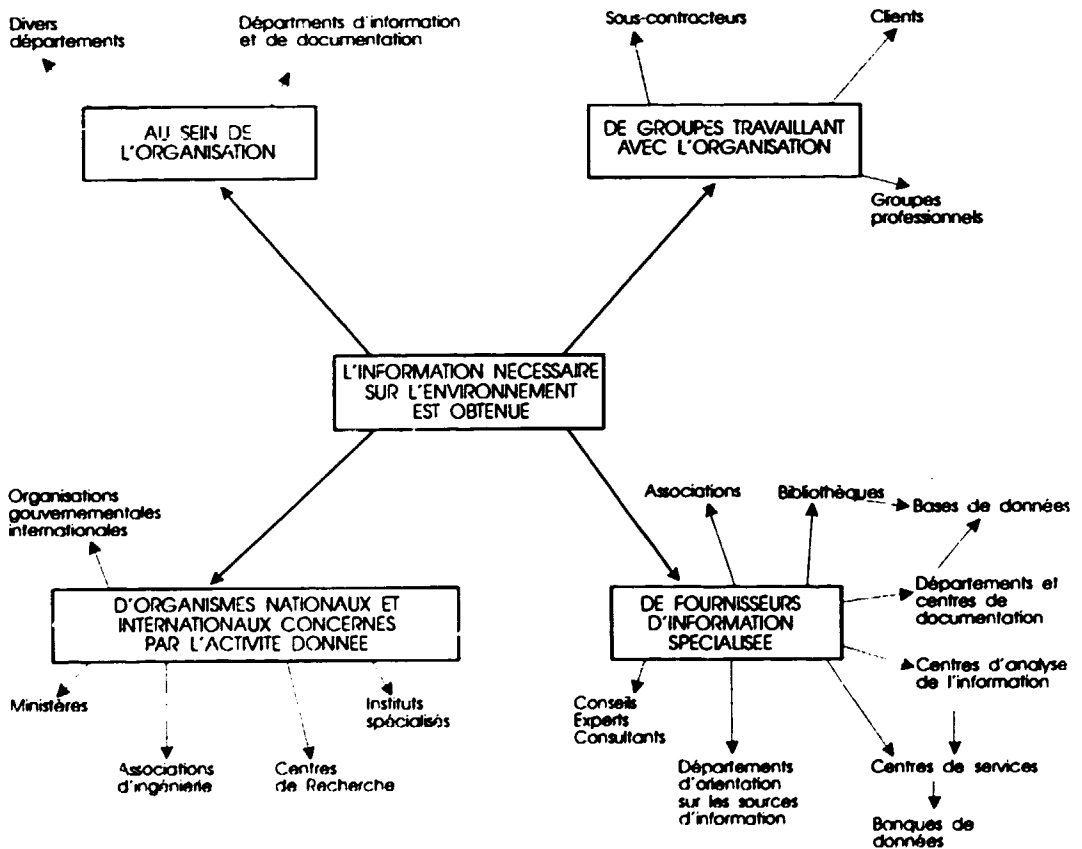


Figure 9 Catégories de fournisseurs d'informations



- **Bibliothèques**

Ces organismes ont, dans la perspective de regrouper des documents, des objectifs variés. Il convient de les connaître, afin de choisir judicieusement ceux auxquels on fait appel. On les distingue selon:

- La caractéristique des supports: écrit, disques, bandes magnétiques, films, objets;

- Le type de documents écrits – certaines bibliothèques contiennent des ouvrages ou des périodiques, d'autres des rapports de recherche, d'autres des brevets;

- La responsabilité de la conservation – archives, bibliothèques nationales, bibliothèques spécialisées à caractère national, offices nationaux des brevets; ou, d'autre part, bibliothèques publiques, d'entreprises, d'écoles;

- Le domaine couvert – les unes sont spécialisées dans un secteur défini de connaissances, les autres au contraire sont multidisciplinaires;

- Les utilisateurs auxquels elles s'adressent.

- **Services et centres de documentation**

Ils ont la tâche de regrouper le signalement des informations contenues dans les documents et font référence aux documents qui les contiennent. Ils se différencient eux aussi suivant:

- La nature des documents objets du signalement. Certains centres regroupent toutes les catégories de documents, d'autres au contraire ne regroupent que certaines catégories;

- Le (ou les) domaine d'intérêt, suivant que le centre travaille pour une mission donnée ou pour une discipline donnée;

- Les tâches effectuées et les services offerts;

- La clientèle visée et l'accessibilité. Les centres sont alors à caractère:

- international (conçus et organisés pour répondre aux besoins de plusieurs pays)

- national (ils répondent, pour la mission qui leur a été confiée, aux besoins d'un pays)

- professionnel (ils répondent aux besoins d'une profession)

- individuel, propre à un organisme donné.

- **Centres d'analyse de l'information**

Leur objectif est d'exploiter le contenu des documents afin de fournir des informations adaptées aux besoins spécifiques. Ils fournissent des réponses à des demandes de renseignement, publient des notes de synthèse, des banques de données numériques ou factuelles.

Ils se différencient selon les mêmes critères que les précédents.

- **Centres serveurs**

Ils collectent et rendent accessibles à distance des banques de données bibliographiques, numériques ou factuelles.

- **Services d'orientation vers les sources d'informations**

- **Groupements d'organismes ou de spécialistes susceptibles de mettre en relation avec des sources d'informations vivantes (conseillers, experts, consultants), tels que les groupements professionnels, les associations, les centres de recherche ou les instituts spécialisés.**

Ces groupements disposent eux-mêmes, le plus souvent, de services d'information qui peuvent aussi agir comme services d'orientation vers les sources d'informations (catégorie précédente).

Il existe aussi des répertoires nationaux par type de groupements, que l'on peut consulter dans les services de documentation et d'information des principales administrations nationales concernées.

# EINLEITUNG

Jeder an der wirtschaftlichen Entwicklung Beteiligte wird früher oder später, und zwar gleichgültig, welche Aufgaben er in welchem Tätigkeitsbereich zu erfüllen hat, unweigerlich mit Umweltproblemen konfrontiert.

Welche Techniken eignen sich speziell zur Bekämpfung dieses oder jenes Typs von Umweltverschmutzung? Mit welchen Umweltfolgen ist beim Einsatz einer bestimmten neuen Technologie zu rechnen? Mit welchen Verfahren können wir die Arbeitsumwelt in Produktionsstätten verbessern? Welche Umweltkriterien sind bei der Planung eines Produkts, bei der Realisierung eines Industrieunternehmens, bei der Errichtung von Gebäuden, beim Bau eines Staudammes zu berücksichtigen?

Welche Auflagen müssen einem Industrieunternehmen hinsichtlich der Entsorgung erteilt werden? Welche Schäden können die in Fertigungs- und Verarbeitungsprozessen zum Einsatz kommenden Materialien kurz- und langfristig verursachen? Wie hat man angesichts der Verknappung zu agieren (Wasser-, Energie-, Rohstoffwirtschaft)? Was tun mit Produkten, wenn sie zu Sondermüll werden (Berücksichtigung der Lebens- bzw. Verbrauchsdauer von Produkten, Entsorgung veralteter Produkte)?

Wie hoch sind die Kosten bzw. Gewinne bei dieser oder jener Umweltschutzmaßnahme im Vergleich zu den Mitbewerbern?

Diese Beispiele zeigen, wie vielfältig die Probleme sind, mit denen man im Laufe seines Berufslebens zu tun haben kann. Für die einen werden sich solche Probleme nur in Ausnahmefällen stellen, andere wieder werden sich tagtäglich damit auseinandersetzen haben.

Jedenfalls wird es sich um sehr konkrete Probleme handeln, die ebenfalls sehr konkrete Informationen unterschiedlichster Art verlangen, stets anders gelagert, je nach Fall, je nach Einrichtung oder Stelle, in der sich die Probleme stellen, und je nach Land.

Dazu kommt noch, daß die Beziehungen zwisch-

en industriellen Aktivitäten und ihren Auswirkungen auf die natürliche Umwelt und auf die Gesellschaft komplex sind und viele Bereiche berühren.

Wie soll man also den eigenen Fall angehen? Wie die Bereiche bestimmen, auf die er sich auswirken könnte? Welche Informationen auswählen?

Für die Suche nach maßgeblichen Informationen, drängt sich ein methodischer Ansatz geradezu auf, und zwar aus folgenden Gründen:

- Die Analyse eines Falles ist kompliziert. Welche Faktoren müssen in der Folge berücksichtigt werden? Wie sind sie zu bewerten?
- Der durch den Begriff "Umwelt" bezeichnete Bereich ist vage. Er ist interdisziplinär und kann alle Wissens- und Tätigkeitsgebiete berühren. Doch welche soll man heranziehen? Nach welchen Auswahlkriterien? Wie soll man vorgehen?

- Der Umweltschutz geht alle Länder an und erfaßt alle Aktivitäten. Die Informationsmittel und die Stellen, die als Informationslieferanten in Frage kommen, sind dementsprechend zahlreich und über die ganze Welt verstreut. Wie erfährt man von ihnen, wo soll man sie suchen, wie sie auswählen, um die benötigten Informationen zu erhalten?

- Der Fortschritt der Informationstechnologien hat dazu geführt, daß zahlreiche und unterschiedliche Zugangsmöglichkeiten zu Informationen entwickelt und verwirklicht werden können. Wie erhält man Kenntnis von solchen Mitteln und wie wählt man sie je nach Bedarf aus?

- Der Bereich Umwelt hat es an sich, daß die Informationsexplosion und -multiplikation entweder zu einer Unter- oder Überversorgung mit Informationen führt, wenn man nicht über eine Methode zur sinnvollen Auswahl verfügt.

Mit dem vorliegenden, aus zwei Teilen bestehenden *Wegweiser* soll die Informationsauffindung er-

leichtert werden:

a) indem Hilfestellung geboten wird bei der Definition und Analyse eines Problems, des Umfeldes, in dem sich ein Problem stellt, und der Ziele, die Informationsbedarf bestimmen<sup>1</sup> (Erster Teil, Kapitel 1);

b) indem eine Methode zur Bestimmung der

Merkmale der zweckdienlichen Informationen und zur deren Beschaffung an die Hand gegeben wird (Erster Teil, Kapitel 2);

c) indem eine Liste von Informationsmitteln und möglichen Informationslieferanten vorgeschlagen wird (Zweiter Teil).

<sup>1</sup> Umweltspezialisten kennen in der Regel das anstehende Problem in seiner Gesamtheit, wissen, daß es Informationen dazu gibt und wo sie zu beschaffen sind. In diesem Fall bietet ihnen der Wegweiser eine Orientierungshilfe für die Auffindung der benötigten zusätzlichen Informationen.

## **ERSTER TEIL**

### **DIE METHODE**

**Wie informiert man sich über  
die Umweltfolgen eines Industrieprozesses?**

# KAPITEL 1

## ANALYSE DES ANSTEHENDEN PROBLEMS (Vor der Informationsbeschaffung)

### DAS PRINZIP DER DIAGNOSESTELLUNG

**Sich zu informieren heißt zu allererst Diagnose und Analyse des anstehenden Problems.**

Der Bedarf an umweltbezogenen Informationen ergibt sich immer aus dem jeweiligen Vorhaben, das definiert und beurteilt werden muß, bevor man an die Beschaffung der Informationen geht. Zuerst muß man wissen, was man mit den zu beschaffenden Informationen tun will.

Die Methode zur Auffindung umweltrelevanter Informationen beruht auf der genauen Identifizierung des angestrebten Ziels:

- Was will man erreichen – Informationen wozu?
- Um welche Organisation handelt es sich?
- In welchem Umfeld steht sich das betreffende Problem der Umweltbelastung oder des Umweltschutzes (welche Bedingungen herrschen vor)?
- Mögliche Konsequenzen des Problems?
- Konkrete Bedingungen, unter denen die zu beschaffenden Informationen verwendet werden sollen – wer ist betroffen?

Der Ingenieur, der sich um Umweltinformationen bemüht, arbeitet meist im Team, ganz gleich, welcher Stelle/Einrichtung er angehört; also ist auch die Informationsbeschaffung in den meisten Fällen eine Gemeinschaftsaktion. Die vorgeschlagene Methode, die auf der Analyse des Vorhabens beruht, für das die Informationen benötigt werden, kann sowohl von einer allein arbeitenden Einzelperson als auch von einem Team angewendet werden. In letzterem Fall gilt der *Wegweiser* für alle.

Der *Wegweiser* ist sowohl für den Fachmann als auch den Laien in Sachen Umwelt sowie für Informationsspezialisten gedacht.

Umweltspezialisten, also Ingenieure, die täglich mit Problemen der Umweltverträglichkeit, mit der Abwägung der einzusetzenden Technologien oder mit Problemen der Anwendung von Industrieverfahren, der Waren- und Abfallbewirtschaftung, der Aus- und Weiterbildung usw. zu tun haben, werden ihn zur Bestätigung oder Ergänzung von Informationen verwenden, über die sie bereits verfügen. Jeder wird dann, natürlich je nach Sachlage, für sich entscheiden, ob bzw. inwieweit er die Methode nutzbringend einsetzen kann.

Nichtspezialisten in Umweltbelangen, worunter diejenigen zu verstehen sind, die nur gelegentlich mit Umweltproblemen zu tun haben, etwa anlässlich eines Berichts über ein Produkt, eine Technologie, eine Durchführbarkeitsstudie, ein Standortprojekt, die Anwendung von Rechtsvorschriften usw., werden sich des *Wegweisers* zur Auffindung, Organisation und Nutzung der für ihre Zwecke erforderlichen Informationen bedienen.

Informationsspezialisten werden den *Wegweiser* heranziehen, um ein Informationssuchen eines mit einem Umweltproblem konfrontierten Ingenieurs zu beantworten. Der Ingenieur kann anhand des *Wegweisers* seinen konkreten Fall genau analysieren und ihn demjenigen, von dem er informiert werden will, beschreiben; letzterer wird in die Lage versetzt, fehlende Daten zu dem betreffenden Fall anzufordern, die Informationen zu beschaffen und sie so zu liefern, wie es in der Anfrage verlangt wurde.

Der *Wegweiser* ist ein Instrument des Dialogs zwischen dem Informationssuchenden und dem Informationslieferanten; mit seiner Hilfe können Auslegungsirrtümer, Zeitvergeudung oder Zweifel hinsichtlich der Verlässlichkeit der gelieferten Daten vermieden werden, kurz: man

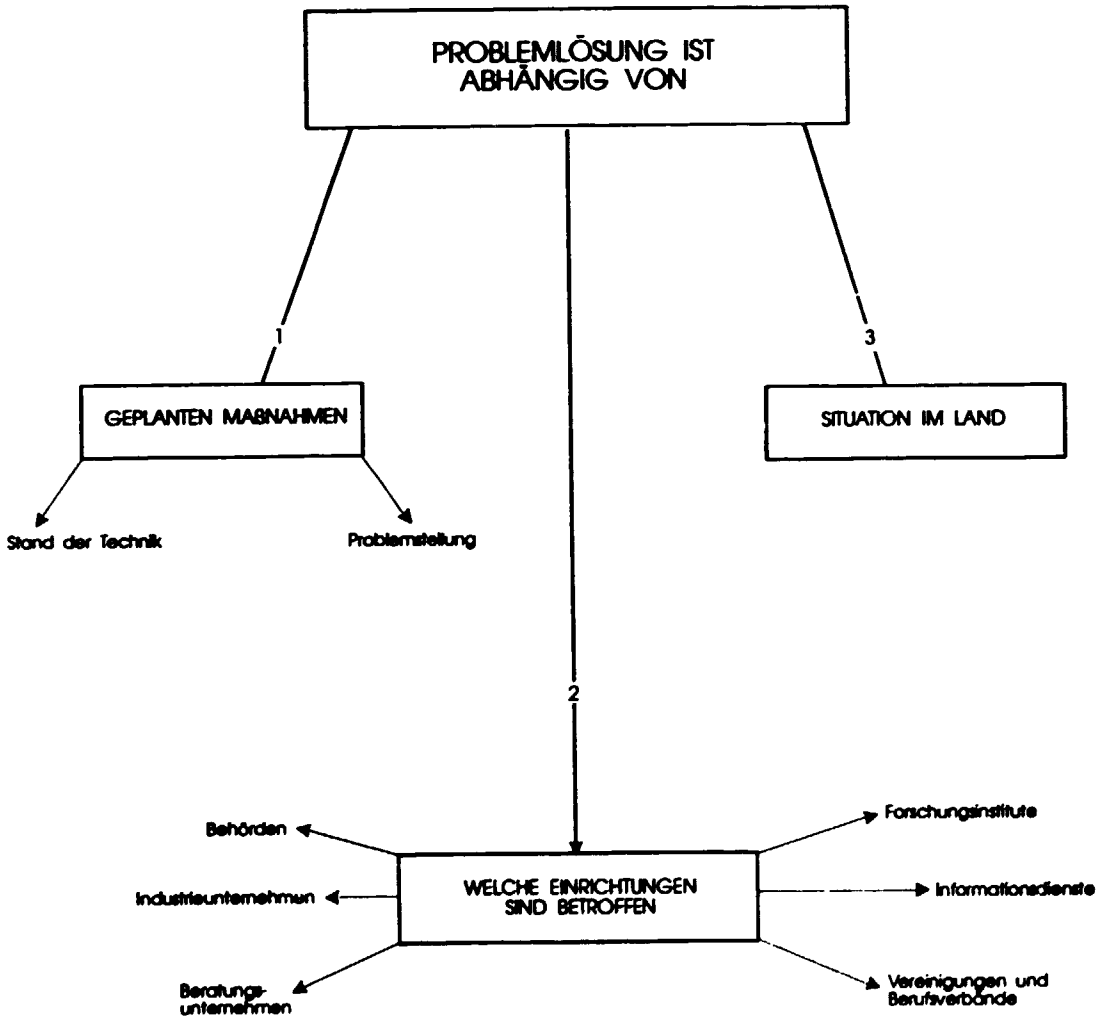


Bild 1 Elemente der Diagnose

erhält das bestmögliche Preis/Leistungs-Verhältnis.

Darüberhinaus ist der *Wegweiser* für den Ingenieur eine direkte Hilfe bei der Durchführung des geplanten Vorhabens unter den bestmöglichen Voraussetzungen, denn:

- die genaue Diagnose des geplanten Vorhabens sowie seiner Ziele und Folgen anhand des vorgeschlagenen Schemas ist die beste Voraussetzung für die erfolgreiche Verwirklichung des Vorhabens;
- das Vorhandensein zuverlässiger Informationen betreffend das – möglichst kostengünstig – zu realisierende Vorhaben verringert Fehlerrisiko und Zeitverlust, ermöglicht, auf Vorhandenem aufzubauen und den Zeitaufwand auf ein Mindestmaß zu beschränken.

Dadurch verringern sich die Kosten des Projekts und es ergeben sich Einsparungen für die durchführende Organisation.

Die Diagnose des zu lösenden Problems besteht in folgenden Festlegungen (Abb.1):

1. Das geplante Vorhaben – was wurde bisher unternommen (gegenwärtiger Stand), worum geht es dabei?

2. Die Art der betreffenden Organisation, wobei zwischen Betrieben, Ingenieurbüros, Verwaltungsstellen, Forschungsinstituten, Bildungsstätten und Informationsstellen zu unterscheiden ist, da sie unterschiedliche Ziele verfolgen;

3. Die Lage im betreffenden Land – zur Erleichterung der Diagnose einer speziellen Situation wurden in dieses Kapitel Musterbeispiele aufgenommen. Ferner wird erläutert, worin und weshalb sich die Informationsbedürfnisse je nach Organisation (mit unterschiedlichen Zielen) voneinander unterscheiden.

Außerdem werden die durch Unterschiede in der Umweltpolitik bedingten Unterschiede im Informationsbedarf verschiedener Länder bei gleichgelagerten Vorhaben aufgezeigt.

Die für die in Kapitel II dargestellte Suchmethode benötigten Merkmale eines Vorhabens, eines zu lösenden Problems – also eines Informationsbedarfs – werden wie nachstehend be-

schrieben herausgearbeitet.

## 1. GEPLANTES VORHABEN

Zur Charakterisierung des geplanten Vorhabens oder des anstehenden Problems sind zwei Dinge wesentlich: wissen, wo man steht, und genau beschreiben, worum es geht (Abb.2).

### 1.1 GEGENWÄRTIGER STAND

Für jedes Vorhaben ist ein logisches Vorgehen erforderlich. Dieses besteht in der Untersuchung der Durchführbarkeit, der praktischen Umsetzung und der Bekanntgabe des Ergebnisses.

Es sind fünf Stadien zu berücksichtigen: jedes von ihnen bedarf unterschiedlicher Informationen über das geplante Vorhaben und gegebenenfalls unterschiedlicher Informationsmittel. Diese Stadien sind:

- Analyse (Ist-Zustände, Projekte, usw.);
- Beschlußfassung (Statusbestimmung, Erwägung zukünftiger Aspekte, Risikobewertung, wirtschaftlicher Kontext, usw.);
- Innovation und Planung;
- Durchführung (Entwicklung, Fertigung, usw.);
- Berichterstattung (schriftlich oder mündlich).

### 1.2 AUFGABENSTELLUNG

Mit Umweltproblemen konfrontierte Ingenieure können direkt oder indirekt mit einem oder mehreren der folgenden typischen Beispiele für derartige Vorhaben befaßt sein:

- Reglementierung der Aktivitäten des Menschen und ihrer Auswirkungen auf die Umwelt;
- Umweltmanagement – Gesetzgebung, Kontrolle, Festlegung von Normen, Erstellung oder Ergänzung bezifferter Überwachungsreihen;
- Verhütung der qualitativen oder quantitativen Schädigung einer natürlichen Ressource und, zu diesem Zweck, Verstehen der Evolutionsprozesse der Lebensräume;
- Gewährleistung der wirtschaftlichen Optimierung bei gleichzeitiger Verringerung der Umweltbelastung und Einhaltung der Vorschriften;
- Entwicklung neuer Produkte, eines neuen Verfahrens, eines Marktes;
- Verbreitung von Informationen über die

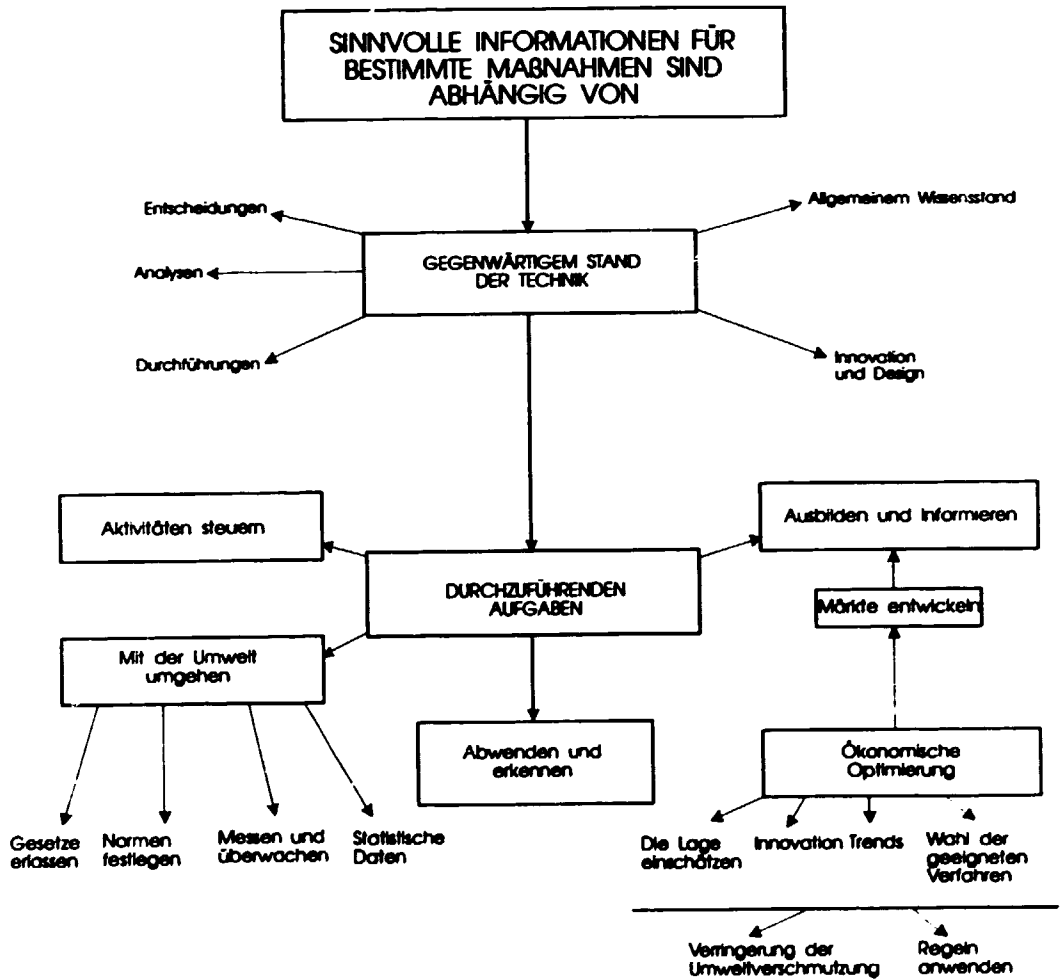


Bild 2 Merkmale der geplanten Maßnahmen



Beziehung zwischen den Aktivitäten des Menschen und der Umwelt;

- Schulung von Mitarbeitern in Umweltfragen im Zusammenhang mit industriellen Aktivitäten und mit der Entwicklung im allgemeinen (auch der landwirtschaftlichen und städtischen Entwicklung).

Das sind durchaus gängige Aktivitäten zum Schutz der Umwelt.

Dennoch unterscheiden sie sich hinsichtlich ihrer Zielsetzungen und somit auch hinsichtlich der benötigten Informationen (siehe Abb. 2).

#### a) Reglementierung der Aktivitäten und ihrer Auswirkungen

Es ist Aufgabe der öffentlichen Hand, Bestimmungen und Vorschriften zu erlassen, die das Handeln der Betreiber sowohl in der Industrie als auch in den Gebietskörperschaften beeinflussen.

Eine über ein spezifisches Umweltproblem besorgte öffentliche Meinung (umweltschädigender Zwischenfall, Verunstaltung der Landschaft, Minderung der Lebensqualität) kann sich auf diese Vorschriften berufen und durchsetzen, daß sie eingehalten und im Interesse der Bewahrung der Umwelt angewendet werden.

Dazu bedarf es:

- bezifferter Daten (Statistiken, Datenreihen oder punktuelle Daten, Synthesen, usw.);
- verschiedener Vorschriften, Bestimmungen und Gesetzesentwürfe, Analysen, usw. zur Erstellung aktualisierter Berichte über einen bestimmten Umweltzustand, die Art der aufgedeckten Mißstände, ihre Dynamik und die Art, wie man sie in den Griff bekommen oder beheben kann.

#### b) Umweltmanagement

Die Bewirtschaftung der Umwelt ist eine sowohl wirtschaftliche wie politische Aufgabe. Die Verantwortlichen eines Landes sorgen, vor allem durch die sparsame und schonungsvolle Verwendung von Land, für die Erhaltung des nationalen Erbes (in qualitativer wie quantitativer Hinsicht).

Die wirtschaftliche Zukunft eines Landes hängt vom umsichtigen Umgang mit den natürlichen Ressourcen ab.

Ingenieure, die unmittelbar mit dem Schutz oder

der Wiederherstellung der Umwelt befaßt sind, benötigen in der Regel Informationen zu folgenden Themen bzw. Zwecken:

- Toxizität verwendeter Rohstoffe und erzeugter Produkte;
- Verringerung oder Aufbereitung der Abfälle und Abwässer;
- Begrenzung oder Ausschaltung ihrer Auswirkungen auf die Umwelt;
- Schutz der natürlichen Umwelt durch die Ausarbeitung und Anwendung von Bestimmungen (über Abfallentsorgung, Städteplanung, usw.);
- Hebung der Lebensqualität durch die Beseitigung von Umweltbelastungen;
- Messungen zur Kontrolle von Schadstoffen und Belastungsfaktoren.

Umweltmanagement besteht aus vier einander ergänzenden Kategorien von Maßnahmen:

#### Gesetzgebung

Für die Regierungen, die Gesetze und Verordnungen zu erlassen haben, und die Betriebe, die die geltenden Bestimmungen anzuwenden haben, sind verlässliche Informationen von größter Bedeutung. Sie vermitteln Kenntnisse über:

- zulässige Höchstgrenzen der Umweltbelastung, Auflagen betreffend Schadstoffausstoß und -emissionen, usw.;
- Art und Menge der durch industrielle, landwirtschaftliche und städtische Aktivitäten produzierten Schadstoffe, usw.;
- Möglichkeiten, im eigenen Land und in anderen Ländern Einfluß auf Anfall und Entsorgung von Schadstoffen zu nehmen, usw.;
- den Schutz sensibler natürlicher Lebensräume und der Landschaft angesichts der vorhandenen Belastungen (intensive Bewirtschaftung, Fremdenverkehr, Entwicklung der Infrastruktur usw.).

#### Ausarbeitung von Normen

Normen und sonstige Vorschriften sind Instrumente der öffentlichen Hand und der Industrie, um Probleme im Zusammenhang mit dem Umweltschutz zu lösen. Jedes Land verfügt über seine eigenen Normen, die anhand von Risikoanalysen

(in bezug auf Bevölkerung und Umwelt) ausgearbeitet werden, die dann einer Analyse der Auswirkungen der Maßnahmen zur Verhütung dieser Risiken für die Industrie und ihre Entwicklung gegenübergestellt wird.

Die hierfür benötigten Informationen beziehen sich auf:

- die Kenntnis der in anderen Ländern geltenden bzw. von den internationalen Organisationen anerkannten Normen;
- die wissenschaftlichen, technischen, sozialen Daten, die diesen Normen zugrundeliegen;
- Daten über die örtlichen Verhältnisse, um fremde Normen gegebenenfalls an spezielle örtliche Verhältnisse anpassen zu können.

#### *Messen und Kontrollieren*

Zur Vorbereitung und Realisierung der Meßeinrichtungen und zur Kontrolle der erhobenen Meßdaten braucht der Ingenieur Informationen über

- die zur Messung und Kontrolle der Belastungen in und um die Betriebe geeigneten Methoden;
- die Normen hinsichtlich der zulässigen Schadstoffgrenzwerte in Abwässern und Emissionen innerhalb und außerhalb der Einrichtungen;
- Technologien zur Verringerung der Umweltbelastung.

#### *Einführung oder Ergänzung bezifferter Datenreihen zur Überwachung der Umwelt*

Die Verwaltungsstellen müssen Daten über die Umweltrelevanz laufender und geplanter Industrieaktivitäten, der Verstädterung, der Landflucht, der Entwicklung der intensiven Landwirtschaft usw. erheben.

Dazu können Studien und Datensammlungen über die Auswirkungen von Produkten und Verfahren sowie über die Ursachen und Folgen getroffener oder zu treffender Entscheidungen erforderlich sein. Zur Erstellung von Grundsatzberichten über die aktuelle Lage in einem Land oder einer Region) könne auch die Dienste von Konsulenten und internationalen Organisationen in Anspruch genommen werden.

#### *c) Verhüten und Verstehen von Problemen im Zusammenhang mit der Umweltqualität*

Wenn davon auszugehen ist, daß eine Industrieaktivität möglicherweise die Umwelt verändert, dann verlagert sich der Informationsbedarf immer mehr in die Zeit vor der Planungs- und Projektierungsphase für ein Produkt bzw. vor der Einführung eines Verfahrens.

Der Informationsbedarf wird dann Teil eines globalen Überlegungsprozesses, der sich sowohl auf das Produkt als auch auf die Technologie bezieht: von der Planung (also von der Nachfrage auf dem Markt) bis zu den voraussichtlichen Folgen für die Umwelt (von der Produktion bis zum Gebrauch).

Dieser Prozeß begünstigt Erfindung und Innovation. Die wirtschaftliche Rentabilität eines Produkts kann durch die Ausschaltung, Änderung oder Wiederverwendung (Recycling) bestimmter Komponenten gesteigert werden.

Um dieses Ziel zu erreichen, bedarf es bestimmter Untersuchungen – und eines rechtlichen Rahmens, der diese möglich macht, bevor die Genehmigung zur Produktionsaufnahme bzw. für den Vertrieb des Produkts erteilt wird – über Art, Ausmaß und mögliche Spätfolgen der Toxizität der in den Verfahren verwendeten Stoffe auf Mensch und Umwelt.

Eine aus einer einzigen Quelle stammende und somit lokalisierte Umweltbelastung ist leichter in den Griff zu bekommen (vor allem, wenn das Problem noch vor der Errichtung und Inbetriebnahme des Industriebetriebs angegangen wird) als Schadstoffe aus nicht eindeutiger Quelle, deren Verbreitungsmuster nicht ausreichend bekannt sind. Ein Informationsbedarf zu dieser Frage besteht sowohl bei den Verwaltungsbehörden als auch in den Betrieben und Ingenieurbüros.

Probleme im Zusammenhang mit dem Transport oder der Verfrachtung gefährlicher Stoffe gehen über die Zuständigkeit des einzelnen Betriebs hinaus und sollten im Rahmen der staatlichen Umwelt- und Umweltschutzpolitik behandelt werden.

### *d) Wirtschaftliche Optimierung*

Sie ist das eigentliche Ziel der Industrieaktivität und geht notwendigerweise Hand in Hand mit Umweltschutzbemühungen der Industrie, die dementsprechend Informationen über beide Bereiche benötigt.

Allgemein kann gesagt werden, daß zur Erreichung der höchsten Rentabilität Informationen für folgende Zwecke erforderlich sind:

- Lagebestimmung – Abschätzung der Auswirkungen und Schätzung der Produktionskosten;
- Innovation – Veränderung oder Verbesserung eines Fertigungsverfahrens und Schaffung neuer Einrichtungen;
- Erkennen von Tendenzen – Einschätzung der Konsequenzen einer gegebenen Situation, Aufzeigen von Verbesserungsmöglichkeiten zur Entwicklung leistungsfähigerer und weniger umweltbelastender Verfahren, Konsequenzen der Weiterentwicklung von Normen für im Einsatz befindliche Verfahren und Produkte;
- Auswahl eines Verfahrens – Kosten der Einführung, mögliche Einsparungen und Gewinne auf dem zukünftigen Markt.

Konkret sind im Interesse des Umweltschutzes eine oder mehrere der folgenden Maßnahmen zu treffen:

#### *Verringerung der Umweltbelastungen*

Der Einsatz von Methoden zur Verringerung der anfallenden Abfallstoffe, Abwässer, usw. kann langfristig Produktionsgewinne herbeiführen, etwa durch Energieeinsparungen. Somit wird die Produktion effizienter.

Recycling und Müllverwertung schaffen neue Märkte, verbessern die Produktivität, verringern den für Kontrolle und Behandlung der am Ende des Produktionsprozesses anfallenden Abfälle erforderlichen Kapitaleinsatz.

In vielen Fällen hat sich der Einsatz nicht umweltbelastender Technologien als für Bevölkerung und Industrie gleichermaßen vorteilhaft erwiesen.

Diesbezüglich suchen die Betriebe nach Informationen über Verfahren, Technologien, Werk-

stoffe oder Ausrüstungen, die vor und nach der eigentlichen Fertigung zum Einsatz kommen können.

#### *Anwendung der Gesetze und Verordnungen*

Umweltnormen, die in Spezifikationen und in den geltenden Bestimmungen enthalten sein können,

- haben zwingenden Charakter und können Gesetzeskraft haben – in diesem Fall können sie heute oder in naher Zukunft durchgesetzt werden. Man muß sie kennen, um sie einhalten zu können;
- sind Informationsquellen für diejenigen, die sich über die zulässigen Höchstwerte für bestimmte Abfall- oder Emissions-Inhaltsstoffe sowie die damit einhergehenden Folgen und Gefahren informieren wollen.

Jeder Industrielle, jede Gebietskörperschaft, jede Regionalbehörde benötigt Informationen über:

- die Kosten der Anpassung an eine Norm;
- die Art und Weise, wie diese Anpassung mit minimalen Kosten, wenn nicht überhaupt mit Gewinn, durchgeführt werden kann.

Der Einsatz von Technologien und Industrie-prozessen, die die Grundsätze des Umweltschutzes beachten (sparsamer Umgang mit Ressourcen und Energie, Belastungsreduzierung, Recycling) ermöglicht es den Betrieben, wirtschaftlicher und rentabler zu funktionieren. Das ist durch zahlreiche Beispiele belegt.

Diese Anwendungen wecken einen weiteren Informationsbedarf bei den betreffenden Betrieben. Sie benötigen im einzelnen:

- Informationen über neue Technologien;
- Informationen über die bei den bekanntesten Verfahren anfallenden Mengen schadstoffhaltiger Abfälle und Abwässer;
- Informationen über die Rückgewinnung und die Rückführung (Recycling) von Abfallstoffen in den Produktionsprozeß.

#### *e) Erschließung neuer Märkte für neue Produkte oder Verfahren*

Gleichgültig, ob es sich um umweltverträgliche Verfahren, um Ausrüstungsgüter, Messungen, Kontrollen oder die Reduzierung von Um-

weltbelastungen handelt, jede Innovation in diesem Bereich bietet beachtliche Absatzchancen.

Angesichts der steigenden Zahl an Umweltproblemen und ihrer wachsenden Komplexität ist die Industrie bemüht, ökologisch und wirtschaftlich annehmbare technische Lösungen zu entwickeln oder einzuführen. Das gilt beispielsweise für die Produktion und die Entsorgung von Giftmüll oder die Unfallverhütung in der Industrie (Risikoabschätzung).

Diesbezüglich sind Informationen zu folgenden Themen einzuholen:

- Märkte;
- Patente;
- "saubere" Verfahren und Technologien.

Diese Aktivität geht Hand in Hand mit mittel- und langfristigen Prognosen und Marktanalysen.

*f) Vermittlung von Kenntnissen – unterrichten (lehren) oder unterrichten (informieren)*

Austausch und Weitergabe von Informationen erfolgen aufgrund:

- einer (mehr oder weniger genau formulierten) Anfrage;
- einem Informationsangebot (seitens einer Dienststelle, einer Person oder einer Institution);
- des Transfers der verfügbar gemachten Information zwischen der anfragenden Stelle und der Stelle, die die Information liefert.

## 2. UM WELCHE ORGANISATION HANDELT ES SICH?

Die bisher vorgestellten Maßnahmen betreffen Betriebe, Verwaltungsdienststellen, Forschungsinstitute sowie Bildungsstätten und Informationsstellen. Da diese verschiedenen Organisationen unterschiedliche Aufgabenstellungen haben, stellen sich die zu bewältigenden Probleme und die gewählten Lösungsansätze – angesichts der unterschiedlichen Kontexte – jeweils anders dar.

Der Weg zur Lösung des jeweiligen Problems führt daher über die Analyse des Stellenwerts der Umwelt bei den Zielen der Organisation, für die die Maßnahmen getroffen werden sollen oder die

mit dem Problem konfrontiert ist.

Diese Faktoren bestimmen den Informationsbedarf, d.h. die Art von Informationen, die für den konkreten Fall von Bedeutung sind, sowie die Art und Weise, wie die Informationen erhoben und genutzt werden (siehe hierzu Kapitel II).

Als Hilfe für den Ingenieur bei der Analyse seines konkreten Falles werden nachstehend die wesentlichen Überlegungen in Sachen Umweltschutz für jede dieser Organisationen angeführt (Abb. 3).

### 2.1 VERWALTUNGSBEHÖRDEN

Ihre Funktion ist es, die Bürger und Unternehmen des Landes zu schützen bzw. Dienstleistungen für sie zu erbringen. Der öffentlichen Verwaltung obliegt im Interesse der Allgemeinheit Überwachung und Schutz der Umwelt und der Lebensqualität der Bevölkerung.

Die Kriterien, nach denen entschieden wird, welche Informationen erforderlich sind, hängen von der Art der zu erbringenden Dienstleistung und dem geographischen Zuständigkeitsbereich ab (international, national, regional, lokal usw.).

Die zu erbringenden Dienstleistungen, die im vorhergehenden Kapitel beschrieben wurden, gehören zu den wesentlichen Aufgabenstellungen der Verwaltung. Konkret handelt es sich um Gesetze und Verordnungen, Kontrollen, Messungen, Raumplanung, die Bewirtschaftung natürlicher Ressourcen, den Schutz der Volksgesundheit usw.

Der Informationsbedarf für diese einzelnen Aktionen ist ebenfalls vorrangig. In der Regel sind die dafür bereitgestellten Budgetmittel auch bedeutend höher als im Falle eines Betriebes.

Der geographische Zuständigkeitsbereich einer solchen Verwaltungsbehörde kann sich von der lokalen bis zur internationalen Ebene erstrecken. Dementsprechend groß sind auch die Unterschiede in den bereitgestellten Mitteln, den erforderlichen Informationen und den Mitteln zu ihrer Verbreitung, wie anhand der zwei folgenden Beispiele gezeigt werden soll.

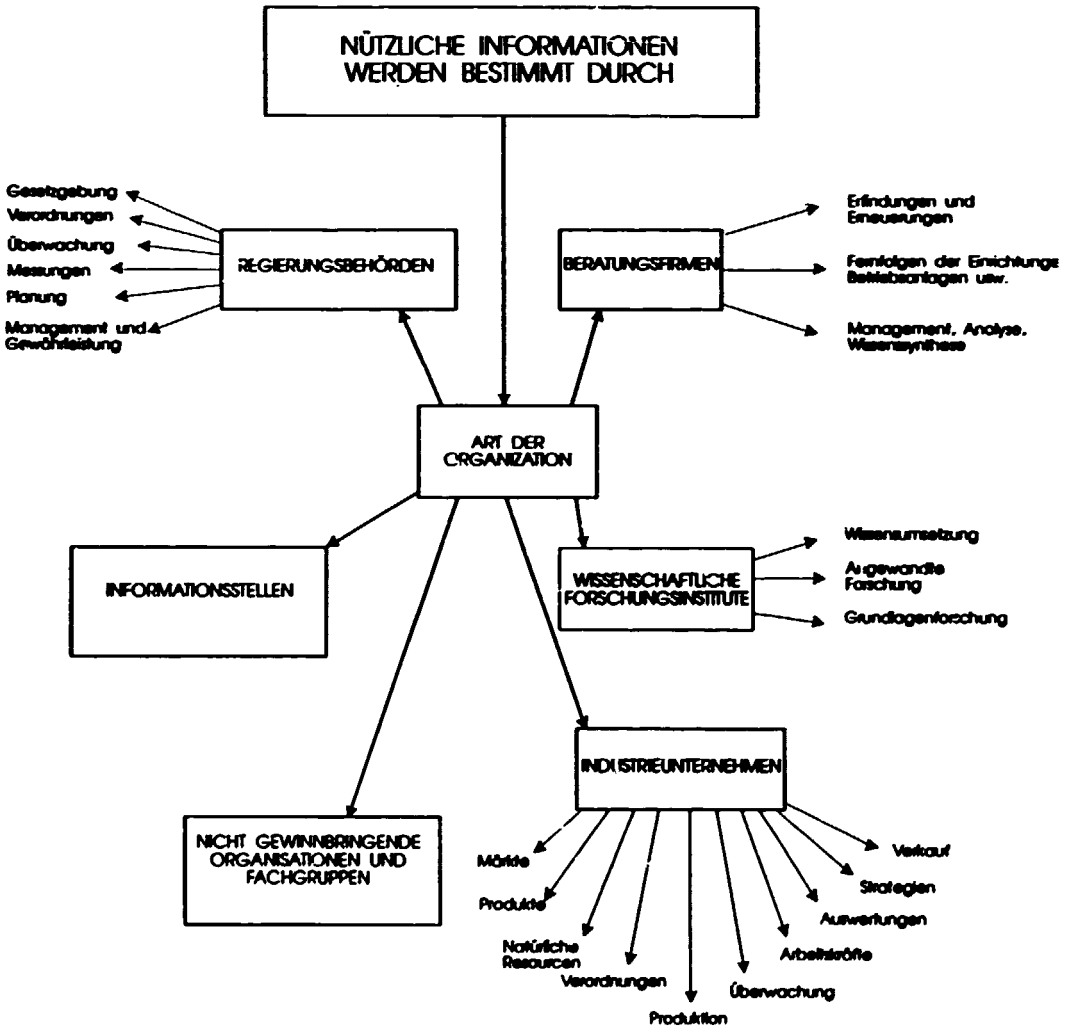


Bild 3 Kategorien von Organisationen und ihre Aktivitäten für Umweltinformationen

**Beispiel 1:** Ein Umweltministerium will Meßstellen zur Kontrolle der SO<sub>2</sub>- und NO<sub>x</sub>-Emissionen der Wärmekraftwerke des Landes einrichten, um zu überprüfen, ob es mit den im Einsatz befindlichen Verfahren möglich ist, neuen Gesetzesnormen zu entsprechen. Dazu müssen dem Ministerium sämtliche Verfahren zur Emissionskontrolle sowie zur Entschwefelung und Denitrifikation von Emissionen bekannt sein, und zwar sowohl hinsichtlich der technischen Aspekte als auch der Kosten und der Einbau- und Wartungserfordernisse für solche Anlagen.

**Beispiel 2:** Eine öffentliche Stelle soll rasch die Baugenehmigung für eine Recycling-Papierfabrik erteilen. Sie braucht dazu Informationen über Papier-Recyclingverfahren und über die Folgewirkungen solcher Werke für die Umwelt.

## 2.2 INDUSTRIEUNTERNEHMEN (Konsumgüterproduktion und Erbringung von Dienstleistungen)

Die Betriebe sind ebenso wie Planungs-, Ingenieur- und Entwicklungsbüros Akteure der industriellen Entwicklung; ihr Zweck sind Erzeugung und Vertrieb von Gütern oder Dienstleistungen zwecks Erzielung von Gewinn. Die Kosten, Arbeitszeiten sowie die kurz-, mittel- und langfristige wirtschaftliche Optimierung beeinflussen maßgeblich Produktion und Rentabilität und bestimmen in großem Maße die Art der benötigten Informationen. Der Umweltschutz beeinflusst somit den Verkaufspreis des Produkts und in der Folge den Markt. Die Erzeugung eines umweltfreundlichen Produkts hat direkte Auswirkungen auf dessen Vertrieb. Es muß ein Kompromiß zwischen dem Markt und den Herstellungskosten des umweltfreundlichen Produkts gefunden werden. Konkrete Informationen sind die Grundvoraussetzung für

diesen Kompromiß.

Die zu lösenden Umweltprobleme ergeben sich aus den wesentlichen Aktivitäten des Unternehmens:

- Kenntnis des nationalen oder internationalen Marktes;
- Innovation und Entwurf eines Produkts;
- Einsatz von Rohstoffen;
- Einhaltung internationaler Bestimmungen;
- Verfahren zur Fertigung eines Produkts;
- Qualitäts- und Mengenkontrolle der Produkte und Verfahren;
- Humankapital;
- Festigung und Weiterentwicklung der Kenntnisse;
- Ergebnisbewertung;
- Festlegung einer Strategie;
- Vermarktung von Produkten und Dienstleistungen.

Fragen des Umweltschutzes können sich bei jeder dieser Aktivitäten stellen. Man wird sich insbesondere über folgende Punkte Klarheit verschaffen müssen:

- Welche Vorschriften gelten am Standort bzw. innerhalb des Werks? Wie sind sie anzuwenden?
- Wie entwickelt man ein umweltfreundliches Produkt, das auf den Zielmärkten wettbewerbsfähig ist?
- Wie verhindert man, daß die Produktion und in der Folge der Vertrieb und die Verwendung eines Produkts die Umwelt belasten?
- Wie mißt, kontrolliert und verringert man die Abfälle und Emissionen eines Industriebetriebs?
- Mit welchen Kosten muß man rechnen bzw. welche Gewinne kann man erwarten, wenn man umweltfreundliche Verfahren einführt oder Müllreinigungs-, Klär- oder Recyclinganlagen einbaut?
- Welche wirtschaftlichen Folgen hat eine im Interesse der Verhütung von Arbeitsunfällen durchgeführte Risikobewertung?

Die zur Beantwortung dieser Fragen erforderlichen Informationen variieren von Fall zu

Fall; in allen Fällen sind sie jedoch sehr vielschichtig und müssen – wie die nachstehenden Beispiele zeigen – unter Berücksichtigung der Unternehmensziele des betreffenden Betriebes erhoben und ausgewertet werden:

**Beispiel 1:** Ein Entsorgungsbetrieb für Giftmüll hat ein neues (umweltfreundliches) Verfahren zur Entsorgung von PCB in Altöl entwickelt. Das Verfahren wurde weltweit patentrechtlich geschützt. Nun möchte der Betrieb den spezifischen Markt für dieses Produkt erweitern und ein Vertriebsnetz aufbauen. Dazu wird er sich um Informationen über folgende Bereiche bemühen – das Ausmaß der durch PCB verursachten Umweltprobleme in bestimmten Teilen der Welt, in denen er Fuß fassen möchte, die Rechtsvorschriften über chemische Verfahren, wenn PCB-haltiges Öl in das Meer eingeleitet wird, die internationale Klassifizierung PCB-haltiger Öle nach ihrer Toxizität, die Rechtslage betreffend internationale Transporte und die Lagerung, Angaben über die in den einzelnen Ländern anfallenden Mengen an giftigem Öl, usw.

**Beispiel 2:** Der Betreiber eines Stahlwerks möchte den Gesundheitsschutz für die Beschäftigten verbessern. Er plant, Meß- und Kontrolleinrichtungen zur Überwachung der Staub- und Abgasbelastung innerhalb und außerhalb des Werks und im umgehenden Wassersystem einzurichten. Er holt also Informationen über Kontrollverfahren für Luft- und Wasserverschmutzung und über Schulungsprogramme für Mitarbeiter ein, die dann bei der Einrichtung des geplanten Dienstes mitwirken sollen.

**Beispiel 3:** Ein Industriekonzern beabsichtigt, die in der Nadelholzindustrie anfallenden Abfälle zu Farbstoffen weiterzuverarbeiten, und beschafft sich Informationen über geeignete Technologien, da bekannt ist, daß das in großen Mengen anfallende und als Farbstoff geeignete Polyphenolderivat auch als Bindemittel und Kleber in der Spanplattenerzeugung verwendet werden kann, wenn es mit anderen Substanzen kombiniert, polymerisiert und gehärtet wird.

### 2.3 INGENIEURBÜROS

Sie sind der Ausgangspunkt der industriellen Entwicklung, sie planen, untersuchen, bereiten vor und lassen Infrastruktur, Industrieanlagen, Gebäude, Produkte usw. bauen.

Bei jedem dieser Vorhaben muß die Umwelt bedacht werden, was sich je nach Projekt in unterschiedlichen Überlegungen äußert. Den Ingenieurbüros ist an Umweltbelangen ebenso gelegen wie Betrieben, allerdings mit dem Unterschied, daß sie zukunftsorientierter agieren und sich ständig auf anders gelagerte Fälle einstellen müssen. Die Umweltprobleme, mit denen sie konfrontiert sind, betreffen zum Beispiel folgende Bereiche:

- Die Entwicklung und Verbreitung neuer, umweltfreundlicher Verfahren, neuer Technologien oder neuer Produkte;
- Die Auswirkungen von Infrastrukturen, Ausrüstungen und Anlagen auf die Umwelt (manche Entwicklungsprojekte sind mit der Auflage versehen, daß auch die Auswirkungen auf Mensch und Umwelt erforscht werden müssen);
- Die Erstellung von Unterlagen über den Ist-Zustand und Prognosen über alle denkbaren Konsequenzen der Entwicklung in all ihren Varianten.

Die erforderlichen Informationen werden nach denselben Gesichtspunkten ausgewählt wie bei Forschungsinstituten und -zentren, allerdings mit folgenden Unterschieden:

- Kosten und Ausführungsdauer sind von

größerer Bedeutung, da diese Faktoren oft als wesentliche Entscheidungskriterien dienen;

- Die Indikatoren müssen aus Gründen der Rentabilität, die rasch erreicht und größtmöglich sein soll, unter sorgsamer Bedachtnahme auf den Zweck der betreffenden Studie festgelegt werden.

#### **2.4 INSTITUTE FÜR WISSENSCHAFTLICHE GRUNDLAGEN- ODER ANGEWANDTE FORSCHUNG**

Ihr Ziel ist der Erwerb von Wissen oder der Wissenstransfer von einem Fach- oder Anwendungsbereich in einen anderen. Die Basis ihrer Tätigkeit ist die Information. Zeit und Geldmittel stehen reichlich zur Verfügung.

Die von diesen Institutionen benötigten Informationen beziehen sich beispielsweise auf:

- die Erfassung, Vertiefung, Erarbeitung und Verwaltung von Wissen über die Beziehungen zwischen den Bestandteilen natürlicher Lebensräume und den verschiedenen Aspekten der Tätigkeit des Menschen;
- die Grundlagenforschung in den Bereichen Physik, Chemie, Biologie usw. und die Anwendung der Erkenntnisse auf die Beziehungen zwischen Produkten und Stoffen (Schwermetallen, Chemikalien usw.) und den Geweben lebender Organismen (Pflanzen, Tiere) in der Luft, im Boden oder im Wasser, im Zusammenhang mit der Nahrungskette;
- Arbeiten über Wechselwirkungen und Transfermuster von Schadstoffen und Verunreinigungen zwischen einzelnen Lebensräumen, usw.

Kriterien für die Auswahl der Informationen sind folgende:

- Verlässlichkeit und Gültigkeit (möglichst jüngsten Datums) der erhobenen Daten;
- Konzentration bei der Datenerhebung auf das angepeilte Ziel, ohne auf andere Gebiete oder Themen abzuschweifen (heikle Wahl, wenn es sich um die Umwelt oder um Forschung handelt);
- als sachdienlich und verwendbar erkannte Informationen sollten so ausführlich und komplett wie möglich vorhanden sein;
- Aufnahme von (meist persönlichen) Kontakt-

en, die den Nachforschungen eine produktive und anhaltende Dynamik verleihen können.

Manchmal beziehen sich die Nachforschungen auf ein spezielles Problem, das an sie herangetragen wird, das sie aber nicht allein lösen können.

**Beispiel 1:** Ein Forschungsinstitut eines gegebenen Landes soll für einen Vertrag mengenmäßige Daten über die durch die Abfälle einer Zinngrube ausgelösten Belastungsströme und -prozesse hinsichtlich der Trinkwasservorräte erheben. Es wird nun darangehen, alle Studien zum Thema der Auswirkungen von Zinnminenabfällen auf die Umwelt zusammenzutragen, eventuell auch aus anderen Ländern.

**Beispiel 2:** Ein anderes Forschungsinstitut, das auf Studien über die Zellstoffindustrie spezialisiert ist, von der es finanziert wird, sucht Informationen über Technologien zur Lösung eines Umweltproblems durch eine Alkoholfabrik. Die Aufgabenstellung lautet – Reduzierung bestimmter umweltschädigender Substanzen in den Abwässern.

#### **2.5 INFORMATIONSDIENSTE UND MIT DER WISSENSVERMITTLUNG BEFASSTE INSTITUTIONEN**

##### *Dokumentationsdienste*

Ihre Aufgabe ist es, einen Grundstock an Dokumentation zusammenzutragen, ihn zu verwalten, seine Organisation zu verbessern, ihn um andere Wissensgebiete zu ergänzen und Kontakte mit Informationssuchenden zu unterhalten, die sich mit konkreten Problemstellungen an sie wenden, usw.

##### *Einrichtungen zur Information oder Ausbildung*

Zur Wahrnehmung ihrer Aufgaben, der Wissensvermittlung, müssen diese Stellen für eine gute Verfügbarkeit von Informationen sorgen, die dem letzten Wissensstand entsprechen, einfach zu handhaben, leicht zugänglich und gut weiter-



zuverarbeiten sind.

*Veranstalter von Kongressen, Tagungen, Ausstellungen*

Gleichgültig, ob es sich um Gemeinden, um nationale oder internationale Verwaltungsbehörden, Museen oder andere Stellen handelt, beruht eine thematische Tagung oder Ausstellung auf der vorherigen Sammlung und Auswahl kompletter und aktualisierter Informationen.

Welche Informationen ausgewählt werden, hängt von den jeweiligen Umständen ab. So kann man sagen, daß

- Kontakte nach außen für die Beschaffung der gewünschten Informationen von besonderer Wichtigkeit sind. Eine wesentliche Voraussetzung für diese Arbeit ist die Erfassung aller potentiellen Quellen, die zweckdienliche Informationen zur Verfügung stellen können;
- thematische Dossiers zusammengestellt und so organisiert werden müssen, daß die gesuchte Information rasch aufgefunden werden kann.

Zu diesem Zweck sind die Definition der Informationen, die Art, wie sie Benutzern zur Verfügung gestellt werden, die Arbeitsprozesse und -mittel, die Kosten, usw., kurz die Themen, die Gegenstand der hier vorgeschlagenen Methode zur Bestimmung des Informationsbedarfs sind, von vorrangiger Bedeutung, und zwar unabhängig davon, ob Informationsmittel geschaffen oder die Prioritäten der Informationen festgelegt werden sollen.

#### **2.6 NICHT AUF GEWINN AUSGERICHTETE VEREINIGUNGEN UND BERUFSVERBÄNDE**

Die Informationsarbeit dieser Vereinigungen entspricht, was die Bedingungen und Modalitäten anbelangt, der der soeben besprochenen Einrichtungen. Was zu bezahlen ist, hängt von Budget und Zweck der Vereinigung in Sachen Information ab.

Die Auswahl der zu verbreitenden Informationen wird von der Politik der Vereinigung und den Wünschen ihrer Mitglieder bestimmt, von dem Maße, in dem sie die Kontakte zwischen den Mitglieder fördern möchte, und schließlich

von ihrer Funktionsweise.

### **3. DIE LANDESSPEZIFISCHE SITUATION**

Bedarf an Umweltinformationen besteht in jedem Land, in allen Einrichtungen, die direkt oder indirekt mit Industrieaktivitäten zu tun haben. In Umweltbelangen müssen die Maßnahmen einzelner Einrichtungen gleich welcher Art in Verbindung mit ihrem allgemeinen sozio-ökonomischen Umfeld getroffen werden (Abb. 4), da die Art des Informationsbedarfs und die zu dessen Befriedigung erforderlichen Informationsmittel sich ebenso voneinander unterscheiden wie das Ziel der geplanten Maßnahmen und die Bedingungen, unter denen der Bedarf entsteht.

Der Informationsbedarf in Sachen Umwelt kann sehr unterschiedlich sein und wird vom Industrialisierungsstand eines Landes, dem Stellenwert der industriellen Entwicklung in der globalen Entwicklungspolitik und dem Stellenwert, der der Umwelt in dieser Politik eingeräumt wird, bestimmt. Ebenso unterschiedlich sind die Mittel, die zur Informationsbeschaffung eingesetzt werden.

Ausschlaggebend für die Erfahrung im Bereich der Industrie (z.B. saubere Verfahren und Technologien) und den umweltrechtlichen Rahmen, in dem die betreffenden Einrichtungen agieren, ist der Stand der industriellen Entwicklung – er ist auch maßgebend dafür, ob es privilegierte Kontakte zwischen in- und ausländischen Industrie-gruppierungen einerseits (Besitz von Patenten, Technologietransfer, Ausbildungslehrgänge, usw.) und unterschiedlichsten Informationsquellen andererseits gibt.

Je höher der Industrialisierungsstand eines Landes ist, umso vielfältiger und einfacher sind seine Zugangsmöglichkeiten zu Umweltinformationen (was Kosten und Zeit anbelangt).

Die Probleme (auch die finanziellen) und Bemühungen (einschließlich der Auswahlprioritäten und -kriterien) im Zusammenhang mit der Umwelt, Technologien und Innovationen, Messungen und Kontrollen, der Verhütung und Verringerung der Umweltverschmutzung, der

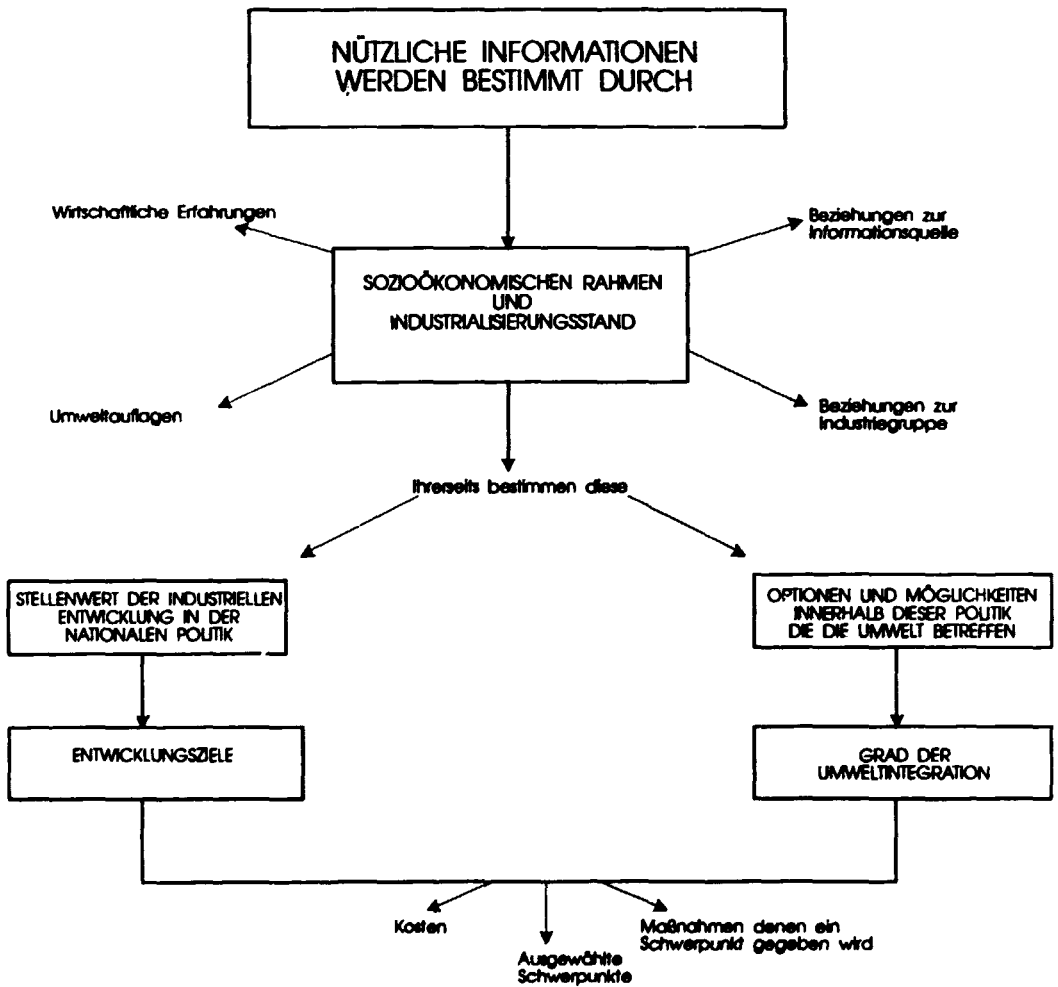


Bild 4 Stand der Industrialisierung und die Voraussetzungen für Umweltinformationen

Organisation und dem spezifischen Wachstum der Umweltindustrie, usw. werden ebenfalls vom industriellen Entwicklungsstand eines Landes mitbestimmt.

Die Art und vor allem Quellen und Herkunft der als sachdienlich anzusehenden Informationen werden daher je nach Sachlage unterschiedlich sein.

Welche Informationen sachdienlich sind, hängt von folgenden Faktoren ab:

- der Art und der Bedeutung der Industriesektoren;
- den Entwicklungszielen und dem Maße, in dem Umweltbelange in der Wirtschafts- und Raumplanung berücksichtigt werden;
- den Handlungsschwerpunkten in Abhängigkeit von den Entwicklungsprioritäten und der Entscheidung (auf gleich welcher Grundlage) zwischen kurz- oder längerfristigen Zielen (wobei letztere eher dazu geeignet sind, daß Umwelterwägungen bei den Beschlüssen

berücksichtigt werden).

Von diesen Zielen, Entscheidungen und Prioritäten hängt ab, welche Informationen beschafft werden müssen und wie sie eingeholt und verbreitet werden; sie sind also ein wesentlicher Faktor für die Analyse und die Festlegung des Bedarfs bei der Auswahl der Informationslieferanten. Hier zwei Beispiele:

- Eine Einrichtung in einem Industrieland wird vor allem Informationen über Märkte, Patente und Rechtsvorschriften, usw. benötigen;
- Eine Einrichtung in einem Land, in dem die Industrialisierung noch im Gange ist, wird meist Informationen über Verfahren (Erzeugung, Verringerung oder Verhütung von Umweltbelastungen, Kontrolle und Messung von Abfällen und Abwässern . . .), ihre Kosten, Umweltnormen in anderen Ländern, die Auswirkungen einer geplanten Fabrik auf die Umwelt, usw. benötigen.

**“Es ist unmöglich, eine Analyse des Informationsbedarfs im Maßstab 1 : 1 von einem Land auf das andere zu übertragen, selbst wenn es sich um den Bedarf von Ingenieuren derselben Fachrichtung in einer gleichartigen Einrichtung handelt. Die Art, die Quellen, der Ursprung der sachdienlichen Informationen hängen ebenso wie die Modalitäten der Erfassung und Verbreitung der Informationen vom Entwicklungsstand der Länder ab.”\***

\* Approche méthodologique pour identifier les besoins en information des ingénieurs\* (vorläufige Fassung). UNISIST, UNESCO, 1984, S. 11

# KAPITEL 2

## DIE VORGEHENSWEISE

### DAS PRINZIP DER VORGEHENSWEISE

Im ersten Kapitel haben wir folgende Themen abgehandelt:

- Die unterschiedlichen Vorhaben und Situationen, in denen ein Ingenieur den Umweltschutz zu berücksichtigen hat;
- Den Prozeß der Diagnose jedes einzelnen Falls anhand von Checklisten, wobei eine solche Diagnose zwangsläufig vor der Informationsbeschaffung zu erfolgen hat und somit Voraussetzung für diese ist (Abb. 5).

### FESTLEGUNG DESSEN, WAS ERREICHT WERDEN SOLL

Analyse des geplanten Vorhabens oder des anstehenden Problems. Diese Analyse wurde bereits in Kapitel 1 erläutert.

Sie gestattet folgende Festlegungen:

- Das Ziel, das man mit Hilfe der zu beschaffenden Informationen erreichen will;
- Das Umfeld, in dem diese Informationen genutzt werden sollen;
- Die Bedingungen, unter denen man die Informationen erlangt: wieviel Zeit ihre Beschaffung in Anspruch nimmt, eventuelle Kosten, Menge der einzuholenden Informationen, erforderliche Genauigkeit. Diese Bedingungen bestimmen die Wahl der Informationsmittel, die für den jeweiligen Zweck das beste Preis/Leistungsverhältnis versprechen;
- Die Prioritäten bei der Suche nach Informationen.

### BESCHREIBUNG DER ZU BESCHAFFENDEN INFORMATIONEN

### IDENTIFIZIERUNG DER INFORMATIONSENQUELLEN

Dank der genauen Kenntnis des Zwecks, zu dem man die Informationen einsetzen will, und des Umfeldes, in dem sie genutzt werden sollen, kann man (Abb. 6):

- den Gegenstand der Informationen (den Interessensbereich) bestimmen und für jede von ihnen den mit ihr verfolgten Zweck;
- genau bestimmen, ob es sich um wissenschaftliche, technische, wirtschaftliche, juristische oder geographische Informationen handelt;
- den Beginn ihres zeitlichen Geltungsbereichs beschränken – bis zu welchem Datum man die Informationen sinnvollerweise zurückverfolgen soll;
- auswählen, woher die Informationen kommen sollen – aus der betreffenden Organisation, aus dem eigenen Land, aus dem Ausland.

Die so definierten sachdienlichen Informationen sind in unterschiedlichsten Dokumenten (im weitesten Sinn) oder Informationsquellen enthalten, die thematisch zum konkreten Fall passen.

Die Analyse des geplanten Vorhabens und die Beschreibung der zweckdienlichen Informationen bieten folgende Möglichkeiten:

- Man kann unter den denkbaren Informationsquellen diejenigen auswählen, bei denen die Wahrscheinlichkeit, daß die gesuchten Informationen dort vorhanden sind, am größten ist;
- Man kann in jedem einzelnen Fall zwischen drei Kategorien von Dokumenten (oder Quellen) unterscheiden, nämlich zwischen hauseigenen Dokumenten, Dokumenten aus dem Inland und Dokumenten aus dem Ausland.

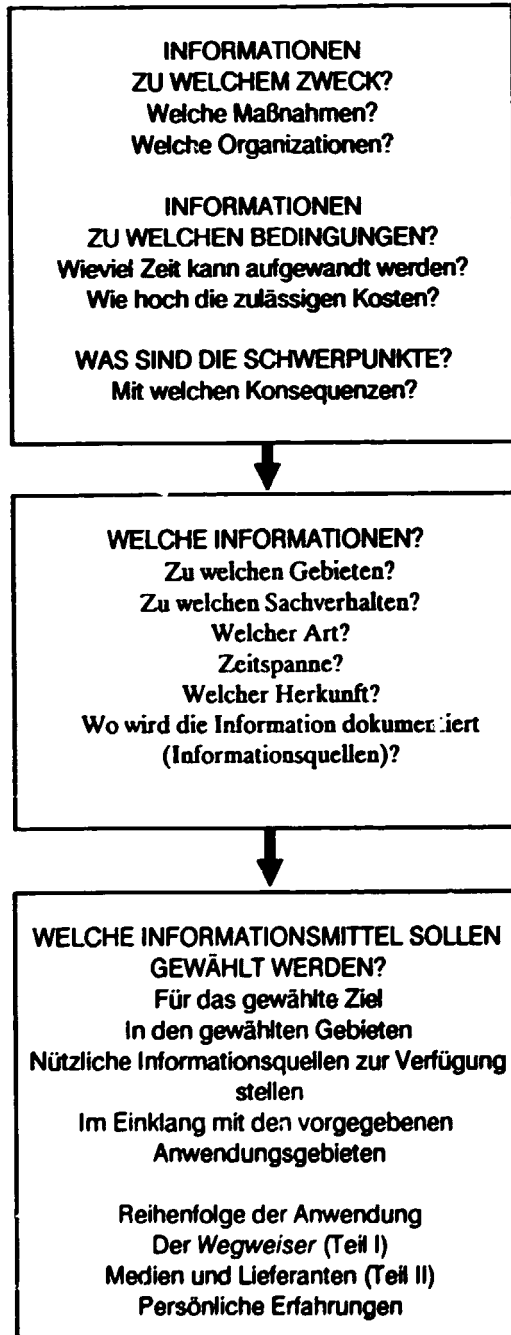


Bild 5 Prinzipien die bestimmend sind für die Suche nach Informationen

# Informationen...aber von kompetenter Seite

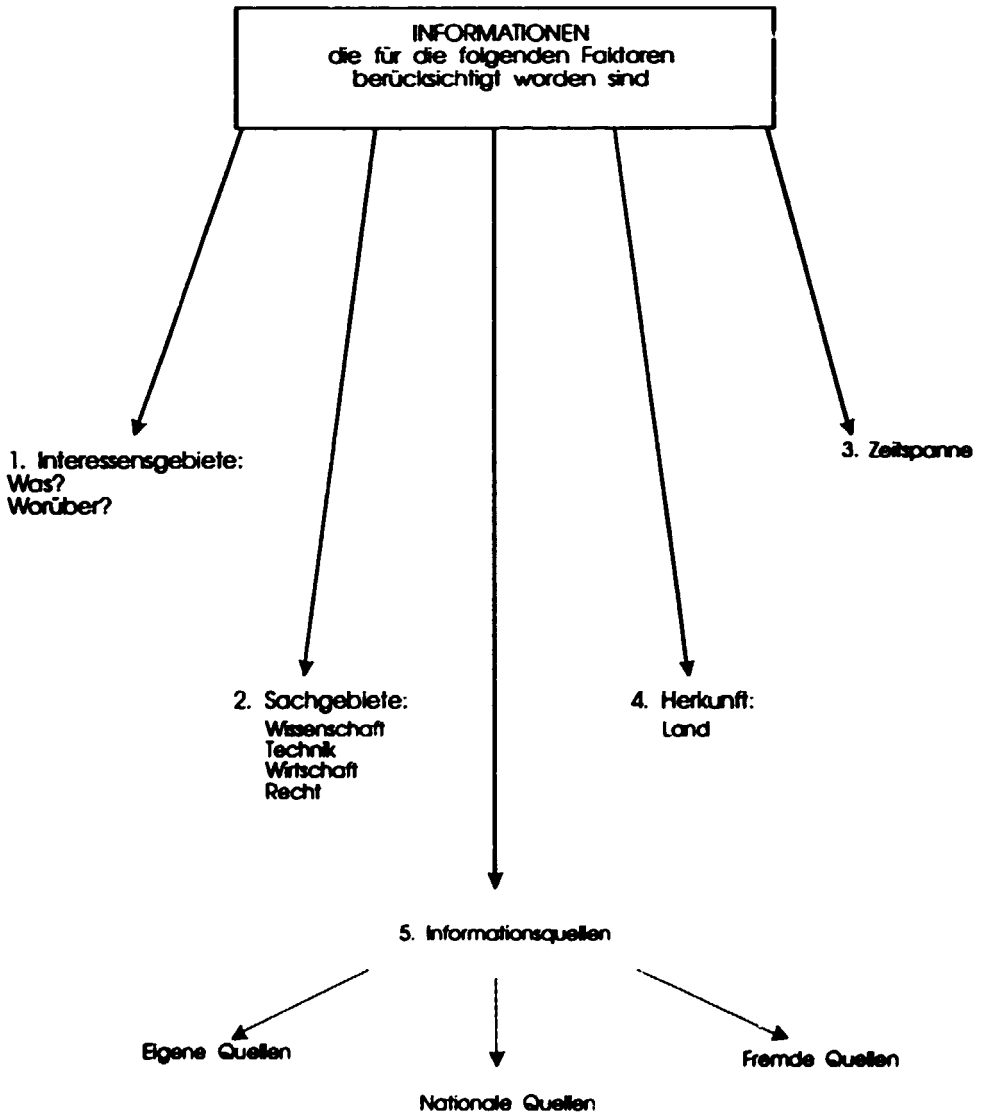


Bild 6 Merkmale nützlicher Informationen

## **AUSWAHL DER MITTEL ZUR BESCHAFFUNG DER GESUCHTEN INFORMATIONEN**

Anhand der Definition der Merkmale der zu beschaffenden Informationen, der Auswahl der geeignetsten Mittel zu ihrer Auffindung sowie der Bestimmung der Bedingungen, unter denen man:

- unter den Einrichtungen, die Informationen an Dritte erteilen, diejenigen aussuchen, von denen man annehmen kann, daß sie das Gewünschte (Informationen und Dokumente) zu den gewünschten Bedingungen liefern können;
- die den festgelegten Bedingungen (EDV-Träger, elektronische Übermittlung, Postweg, mündliche Information, usw.) am besten entsprechenden Modalitäten wählen, wie an diese Einrichtungen heranzutreten ist.

Hier wird genauso vorgegangen wie bei der Auswahl eines Produkts, eines Materials, eines Verfahrens oder eines Ausrüstungsgegenstandes. Deshalb bezeichnen wir in der Folge die Einrichtungen, die Informationen an Dritte weitergeben (Informationszentren, Bibliotheken, Pressezentren, Dokumentationszentren, Betreiber von Datenbanken, usw.), als "Informationslieferanten".

Auf den folgenden Seiten wird nun erklärt, wie man gemäß dem in Kapitel I beschriebenen Grundsatz und den darin enthaltenen Hinweisen vorgeht. Um die Sache zu erleichtern und zur Rationalisierung und Beschleunigung des Verfahrens geben wir bei jedem Schritt die Möglichkeiten an, unter denen ausgewählt werden kann.

### Was versteht man unter "Informationsdienst?"

Eine Organisation, die Informationen sammelt und Informationsquellen nutzt, um die Weitergabe von Informationen an Dritte zu erleichtern.

Diese Weitergabe geschieht entweder auf direktem Wege, indem konkreten Ersuchen entsprochen wird, oder durch Produkte wie etwa periodische Aussendungen, Datenbanken, Bibliographien, Synthesen, usw.

Aus den im "Prinzip der Vorgehensweise" genannten Gründen und aus Gründen der Vereinfachung bezeichnen wir diese Einrichtungen als "Informationslieferanten".

Die Auswahl der geeigneten Lieferanten hängt von den Besonderheiten der jeweiligen Organisation ab:

- ihrem Zweck – Welchen Kundenkreis spricht sie an? Welchen "Auftrag" hat sie?
- dem Wissensgebiet, auf das sich die gesammelten Informationen beziehen;
- der Art der genutzten Informationsquellen: Fachleute, Gegenstände, schriftliche Dokumente, Filme, oder aber die Art der Informationen selbst;
- dem Verarbeitungsstadium der genutzten Informationsquellen;
- ihrer Zuverlässigkeit – Bedingungen und Qualität der Erfassung und der Verarbeitung der gelieferten Informationen;
- der (geographische) Herkunft der genutzten Quellen oder der gesammelten Informationen;
- der Art der Anfrage bei der Organisation oder der Abfrage ihrer Produkte, die sie je nach Fall mündlich (Telefon, Besuch, usw.), auf dem Postweg, auf EDV-Träger (Abfrage von Datenbanken, elektronische Informationsdienste, usw.) oder auf verschiedene elektronischen Übermittlungswegen (z.B. per Fernschreiber, Telefax oder Telekonferenz) zur Verfügung stellt.

Die Kriterien für die endgültige Auswahl sind: die möglichen Kosten der gesuchten Informationen, die gewünschten Fristen, der zusätzlichen Arbeit, die im Zusammenhang mit den erhaltenen Informationen aufgrund der Form, in der sie bereitgestellt wurden, erforderlich ist, sowie die Benutzerfreundlichkeit der Informationen

In Anhang 2 dieses Manuskripts sind die verschiedenen Kategorien von Informationsliefer-

anten angeführt, als Unterscheidungskriterium dient das Verarbeitungsstadium der behandelten Unterlagen.

Der zweite Teil des Wegweisers enthält eine Liste von Einrichtungen, die insbesondere Daten über den Umweltschutz liefern, jede von ihnen mit einer näheren Beschreibung ihres Tätigkeitsbereichs, sofern entsprechende Informationen vorlagen. Außerdem findet sich im zweiten Teil ein Verzeichnis von Informationsprodukten (Datenbanken sowie bibliographisches und audiovisuelles Material). Der gesamte zweite Teil ist durch das Stichwortverzeichnis mit Querverweisen versehen.

### ANMERKUNG:

Ein Informationsbedarf ist meist so mannigfaltig, daß er nur selten durch einen einzigen Informationslieferanten zur Gänze befriedigt werden kann. Hausfremden Informationslieferanten sind die in der eigenen Organisation des Informationssuchenden vorhandenen Informationen wahrscheinlich nicht bekannt. Viele Lieferanten übersehen die "lebenden Quellen", die in vielen Fällen die wichtigsten Quellen für die gesuchten Informationen sind. Außerdem ist es meist mit einem einzigen Lieferanten oder einer einzigen Quelle nicht getan, da Informationersuchen oft sehr kompliziert sind und sich auf stark ins Detail gehende Fälle beziehen. In den meisten Fällen wird es daher angezeigt sein, mehrere Lieferanten anzusprechen und unterschiedliche Kanäle zu nutzen. Von der Auswahl dieser Lieferanten wird abhängen, wie verlässlich die Auskünfte sind, wieviel Zeit ihre Auswertung in Anspruch nimmt und ob man mit den gegebenenfalls dafür angesetzten Mitteln das Auslangen findet.

Diese Auswahl wird umso bessere Ergebnisse bringen,

- je klarer man weiß, was man will und in welcher Form man es will (Phase I und 2 der vorgeschlagenen Methode);
- je mehr Informationslieferanten in zahlreichen Ländern und in den internationalen Organisationen zur Verfügung stehen (Teil II des Wegweisers);
- je mehr man die Auswahl auf die größtmögliche Verlässlichkeit der erforderlichen Informationen zu den festgelegten Bedingungen abstellt.



## PHASE 1: FESTLEGUNG DESSEN, WAS ERREICHT WERDEN SOLL: INFORMATIONEN ZU WELCHEM ZWECK? ZU WELCHEN BEDINGUNGEN?

Nehmen Sie Kapitel I zur Hand und

- wählen Sie die Organisation (Quelle) aus, die auf den speziellen Fall, für den Sie Informationen suchen, zutreffen;
- berücksichtigen Sie die landesspezifischen Verhältnisse und lesen Sie dazu Kapitel I, Abschnitt 3;
- analysieren Sie den konkreten Fall anhand des folgenden Schemas:

### 1. GEPLANTES VORHABEN?

#### 1.1 GEGENWÄRTIGER STAND?

*Bemerkungen*

- Entscheidung
- Analyse
- Innovation
- Planung
- Realisierung
- Verbreitung

#### 1.2 AUFGABENSTELLUNG?

*Bemerkungen*

- Reglementierung von Aktivitäten und ihrer Auswirkungen
- Festlegung von Umweltvorschriften
- Festlegung von Normen
- Messen und kontrollieren
- Erstellung von Zahlenmaterial
- Verhütung umweltrelevanter Probleme
- Wirtschaftliche Optimierung der Industrieaktivität
- Verringerung der Umweltbelastungen
- Einhaltung der Vorschriften

- Erschließung neuer Märkte
- Weitergabe von Wissen
- Lehren
- Informieren
- Sonstiges (bitte anführen)

## 2. UM WELCHE ORGANISATION HANDELT ES SICH?

*Bemerkungen*

- Verwaltungsbehörde (Ministerium, Institut, Rathaus, usw.)
- Industriebetrieb
- Planungs- und Ingenieurbüro
- Forschungsinstitut (Grundlagen- und angewandte Forschung)
- Lehranstalt
- Informationsstelle
- Gemeinnützige Vereinigung
- Sonstiges (bitte anführen)

## 3. LANDESPEZIFISCHE VERHÄLTNISSE

## 4. KONSEQUENZEN DES GEPLANTEN VORHABENS

### 4.1 FÜR DIE BETREFFENDE ORGANISATION:

*Welche?*

- hinsichtlich ihres politischen Konzepts
- hinsichtlich der Erhaltung ihrer Märkte
- hinsichtlich der Erschließung neuer Märkte
- Sonstiges (bitte anführen)

### 4.2 IN DEM BETREFFENDEN LAND:

- für sämtliche Industrieaktivitäten
- auf die öffentliche Meinung
- für eine Kategorie von Personen
- Sonstiges (bitte anführen)

### 4.3 FÜR DEN VERANTWORTLICHEN INGENIEUR ODER DAS VERANTWORTLICHE TEAM

#### 5. BEDINGUNGEN, UNTER DENEN DIE INFORMATIONSBESCHAFFUNG ERFOLGT

Ausgehend von der Beantwortung der vier vorhergehenden Fragen sind nun die folgenden näheren Umstände zu bestimmen:

- Wann werden die Informationen genutzt?
  - Wann müssen sie spätestens vorliegen?
  - Wieviel darf die gesamte Informationsbeschaffung maximal kosten?
  - Wieviel Zeit darf man demnach höchstens dafür aufwenden?
- Weniger als eine Stunde?
- Weniger als einen Tag?
- Weniger als eine Woche?
- Mehr (bitte Dauer angeben)

Wie genau müssen die Informationen sein?

#### Beispiel:

##### Informationen, wozu?

In Indien will das Umweltministerium die Schwefeldioxyd- und Stickoxydemissionen der Wärmekraftwerke reduzieren.

##### Phase 1

1. *Gegenwärtiger Stand?* Realisierung

*Aufgabenstellung?* Umweltmanagement, Messen und Kontrollieren, Reduzierung der Belastungen, Anschaffung von Einrichtungen zur Reduzierung und Kontrolle der Emissionen.

2. *Um welche Organisation handelt es sich?* Verwaltungsbehörde

3. *Landesspezifische Verhältnisse?* Es handelt sich um ein auf dem Wege der Industrialisierung befindliches Land, das über seine eigene Industrie verfügt, das aber Technologien einsetzen will, die gegebenenfalls aus dem Ausland kommen.

##### 4. Konsequenzen?

a) *Für die Organisation:*

- Einrichtung einer Stelle für Verfahrensanwendung und -kontrolle;
- Marktstudie über die kostengünstigsten Verfahren.

b) *In dem betreffenden Land:*

#### ANMERKUNG:

Wenn der Ingenieur die Nachforschungen für andere anstellt: Für wen sind die Informationen bestimmt?

#### Bemerkungen

- die für das Vorhaben verantwortliche Person
- den Direktor oder die Führungsgremien der Organisation
- Personen, die eine Fachstudie durchführen oder eine Dokumentationsstelle betreiben
- Umweltexperten
- Umweltilaien
- Welche Arbeitssprachen können verwendet werden?
  - Über welche Umweltkenntnisse verfügen diese Personen?
  - In welcher Form sollen die Informationen

- Mehrkosten für technische Einrichtungen;
- Positive Auswirkungen auf die Bevölkerung und die Umwelt (im Land selbst und über die Grenzen hinaus).

#### 5. Bedingungen?

*Zeitraum für die Bereitstellung der Informationen im gewünschten Format:* 4 Monate.

*Obergrenze für die Kosten der Informationsbeschaffung:* noch festzulegen (abhängig vom Anwendungsbeschuß).

*Äußerster Zeitraum für die Beschaffung der Information:* 3 Monate.

*Die Unterlagen sind für:* die leitenden Gremien bestimmt.

*Arbeitssprache:* Englisch

*Welche Form?:* Dossier über Verfahren (Merkmale, Ursprung, Kosten für den Erwerb, Kosten beim Einsatz, Kosten für die Wartung).

#### 6. Prioritäten?

- Katalog der Verfahren zur Verringerung der Abgasbelastung, geordnet nach ihrem Preis/Leistungsverhältnis.

**ANMERKUNG:** Phase 2 des Verfahrens ist auf den folgenden Seiten beschrieben.

bereitgestellt werden?

- Dokumente aus erster Quelle
- Adressen- oder Referenzliste
- Dossier
- Zusammenfassung, Bericht

## 6. PRIORITÄTEN

Die Zeit und die Mittel, die für die Informationsbeschaffung aufgewendet werden können, bestimmen zwangsläufig das Ausmaß, in dem der Bedarf befriedigt werden kann. Es bedarf eines Kompromisses zwischen:

- der Beschaffung sämtlicher zur Deckung des Informationsbedarfs geeigneten Informationen und
- der Beschaffung derjenigen Informationen, die unter den festgelegten Bedingungen erhältlich sind.

Zu diesem Zweck müssen Prioritäten

### Beispiel:

Beschreibung der gesuchten Informationen:  
(Fortsetzung des vorhergehenden Beispiels)

In Indien will das Umweltministerium die Schwefeldioxyd- und Stickoxydmissionen der Wärmekraftwerke reduzieren.

Dazu braucht es Informationen über:

*a.den Bereich (die Art der Belastung):* gasförmige Emissionen

*b.die Themen:*

- Thema 1:
  - (b.1) = Verfahren zur Entschwefelung und Denitrifikation der Emissionen;
  - (b.2) = Kosten;
  - (b.3) = Betriebs- und Wartungscharakteristika;
  - (b.4) = Platzfordernisse (Standort).
- Thema 2:
  - (b.5) = Systeme zur Behandlung und Wiederverwendung der Rückstände.

*c.die Art der Information:*

(b.1) und (b.5) – technisch  
(b.2), (b.3) und (b.4) – wirtschaftlich

*d.den zeitliche Geltungsbereich:*

- (b.1) und (b.5) – weniger als 5 Jahre zurück
- (b.2) und (b.3) – weniger als 1 Jahr zurück
- (b.4) – über 5 Jahre zurück

festgelegt werden, die ausschlaggebend sind für die Auswahl der zu beschaffenden Informationen und danach bei der Auswahl der Informationsmittel.

Führer: Sie in einigen Zeilen an, was bei den zu treffenden Maßnahmen bzw. bei dem anstehenden Problem die höchste Rangordnung hat.

## PHASE2a: BESCHREIBUNG DER ZUBESCHAFFENDEN INFORMATIONEN

Lesen Sie die Antworten auf alle in Phase 1 gestellten Fragen nach und ziehen Sie sie entsprechend in Betracht, wenn Sie anhand der Hinweise auf den kommenden Seiten die zu beschaffenden Informationen charakterisieren (siehe auch Abb.6).

Tragen Sie die Ergebnisse in Tabelle 2 ein.

*e.den Ursprung:*

Intern

e.1 – Interne Dienststellen des Ministeriums, die mit der Überwachung der Umweltbelastungen befaßt sind, und des Energiesektors (b.1 bis b.4), deren Aufgabe die Abfallbewirtschaftung ist (für b.5).

Extern

e.2 – Das indische Industrieministerium (Dienststellen, die für den Betrieb von Energieanlagen zuständig sind) (für b.1 bis b.5);

e.3 – Indische Handelskammern (für b.1, b.2 und b.5);

e.4 – Indische Industrielle und regionale wie nationale Berufsverbände (für b.1, b.4 und b.5).

Ausland

e.5 – Ausländische Botschaften (Attachés für Wirtschaftsfragen) (für b.1 und b.5);

e.6 – Internationale Berufsverbände und Organisationen (für b.1, b.2 und b.5);

e.7 – Erzeuger (für b.1 bis b.5)

Die Entscheidung, in welche Richtung diesbezüglich nach Informationen geforscht werden soll, hängt von der Wichtigkeit der zu treffenden Maßnahmen sowie dem Gegenstand und der Art der gewünschten Informationen ab.

## 7. THEMEN DER INFORMATIONEN

Die Themen der Informationen, also ihr Inhalt und worauf sie sich beziehen, werden wie folgt ermittelt:

- Durch den Bereich, den sie betreffen;
- Innerhalb eines Bereichs;
- Durch seinen Zweck und die sich daraus ergebende Aufgabenstellung;
- Wir definieren dies durch die Fragestellung: Welche Art von Information, aus welchem Bereich, zu welchem Thema und zu welchem Zweck?

### 7.1 ART DER AUSGEWÄHLTEN INFORMATION

Tragen Sie in Tabelle 1 die Art jeder einzelnen Information ein: wissenschaftlich, technisch, wirtschaftlich, juridisch, usw. Diese Charakterisierung erleichtert die Auswahl der Lieferanten, die sich oft nach der Art der Informationen, mit denen sie sich beschäftigen, unterscheiden.

### 7.2 AUF WELCHEN BEREICH BEZIEHEN SICH DIE INFORMATIONEN?

In Kapitel 1 haben wir aufgezeigt, daß ein Informationsbedarf unterschiedliche Bereiche gleichzeitig berühren kann (die von Fall zu Fall

#### Beispiel:

Das vorhergehende Beispiel betraf ein Informationsersuchen über Einrichtungs- und Wartungskosten von Abgasentschwefelungs- und -denitrifikationsanlagen, deren Wirksamkeit sowie Verfahren zur Behandlung und Weiterverwendung von Rückständen. Die entsprechenden Informationen können enthalten sein:

- in Katalogen – interne Quelle (wenn der Katalog im anfragenden Ministerium vorhanden ist), externe Quelle (wenn der Katalog bei einer anderen Stelle im eigenen Land beschafft werden kann), ausländische Quelle (wenn der Katalog bei einer Stelle im Ausland beschafft werden muß). Das hat nichts mit dem geographischen Geltungsbereich des betreffenden Katalogs (national oder international) zu tun.

Je nachdem, um welche Kataloge es sich handelt, kann man ihnen die Liste der Lieferanten,

verschieden sind). In der Regel werden es Bereiche im Zusammenhang mit der Umwelt sowie von der Umwelt unabhängige Bereiche sein.

In Abb. 7 sind große Interessensbereiche dargestellt, die bei der Informationsbeschaffung in Sachen Umweltschutz von Bedeutung sein können.

Mit Hilfe dieser Darstellung und ausgehend von den Antworten auf die verschiedenen Fragen der Phase I definieren Sie nun nachstehend die Bereiche; tragen Sie sie in Tabelle 1 ein.

Informationen über:

*Bemerkungen*

- Haus- und/oder Industrienüll
- Haus- und/oder Industrieabwässer
- Abgase
- Giftmüll und toxische Produkte
- Schwermetalle
- Chemikalien (Waschmittel, Pestizide, Düngemittel, Sonstige bitte anführen)
- Radioaktivität
- Lärm
- Gesundheit
- Einrichtung einer Industriezone

die verfügbaren Ausführungen, gegebenenfalls ihren Preis sowie technische Beschreibung Daten und die Wartungserfordernisse (die man in der Regel beim Hersteller erhält), und ähnliches mehr entnehmen;

- in Büchern und Zeitschriften (für die technische Analyse);
- in Patenten (um zu erfahren, wer das Know-how und gegebenenfalls die Vertriebsrechte besitzt);
- in (internen und externen) Berichten und Studien (die bei den Lieferanten vorhanden sind), denen man den Platzbedarf und die Funktionstüchtigkeit in einem gegebenen Umfeld und in einer gegebenen Situation entnehmen kann;
- bei "lebenden Quellen" (Messen, internationalen Organisationen, nationalen und internationalen Berufsverbänden) in Form von Gutachten, usw.

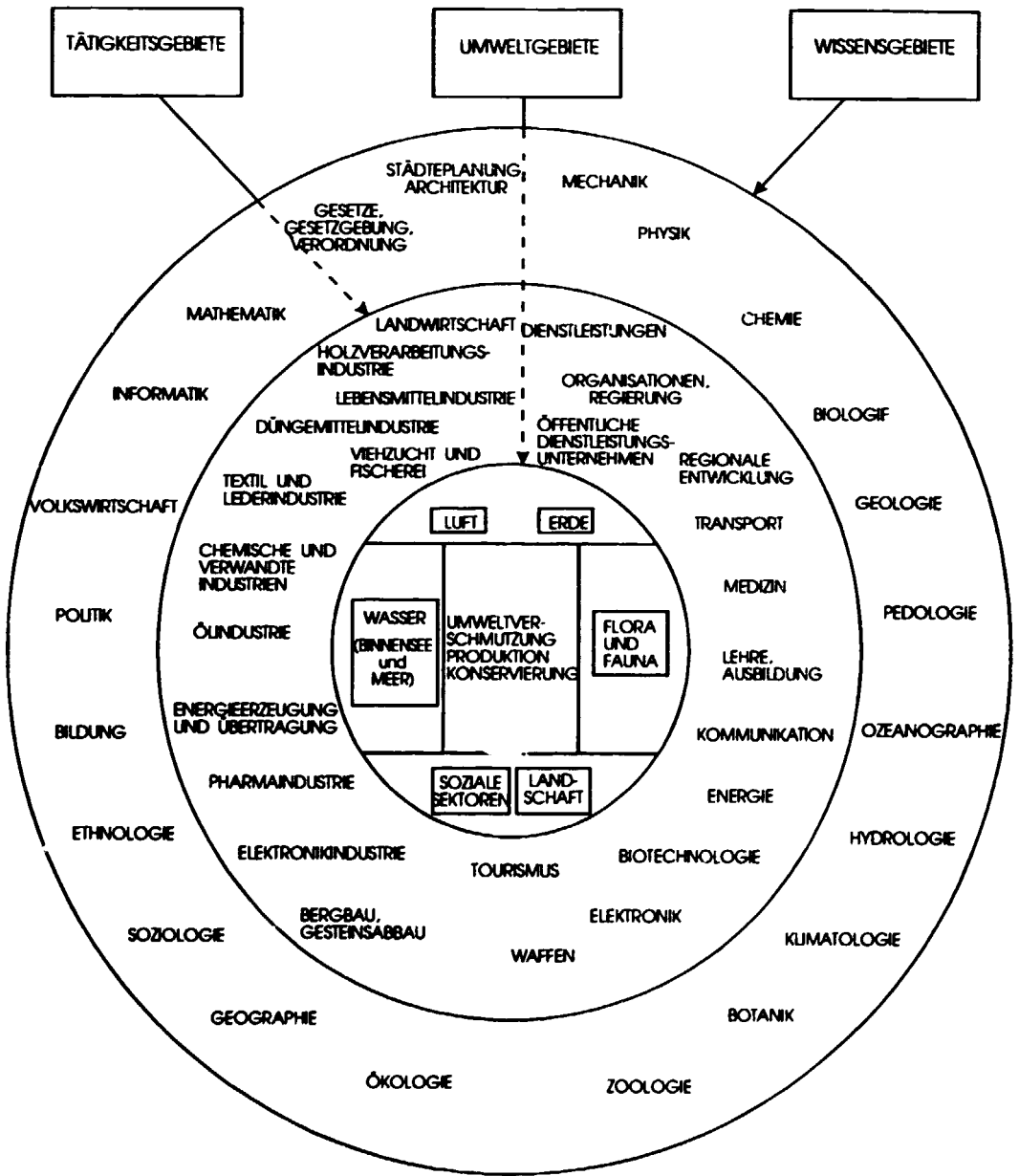


Bild 7 Interessengebiete im Interesse des Umweltschutzes

- Stadtentwicklung
- Sonstiges (bitte anführen):

### 7.3 AUF WELCHES THEMA BEZIEHEN SICH DIE INFORMATIONEN?

In Abb. 8 sind verschiedene Themen des Umweltschutzes angeführt.

Bestimmen Sie anhand dieser Darstellung den Zweck jedes gesuchten Informationsbereichs und tragen Sie die Antworten in Tabelle 1 ein.

### 7.4 RANGORDNUNG DER GESUCHTEN INFORMATIONEN?

Tragen Sie nun entsprechend den Schwerpunkten ihrer Maßnahmen, wie Sie sie in der vorhergegangenen Phase (Punkt 6) festgelegt haben, die Rangordnung der gesuchten Maßnahmen in Tabelle 1 ein.

## 8. WIE WEIT SOLLEN DIE INFORMATIONEN ZURÜCKREICHEN?

Es ist anzugeben, wie weit die Informationen für den betreffenden Zweck zurückreichen sollen. Nötigenfalls sollte dies für jedes einzelne Thema festgelegt werden.

- Informationen, die nicht älter als ein Jahr sind
- Informationen, die nicht älter als 2 Jahre sind
- Informationen, die älter als 2 Jahre aber nicht älter als 5 Jahre sind
- Informationen, die länger als 5 Jahre zurückreichen? (Nähere Angaben erforderlich)

### Thema

## 9. WOHER STAMMEN DIE INFORMATIONEN?

In Kapitel 1 war davon die Rede, daß die zu beschaffenden Informationen unweigerlich unterschiedlichen Ursprungs sind (intern, exterr.), je nachdem, was man mit ihnen bezweckt; es ist in jedem Fall anzuführen, woher die Informationen stammen sollen.

Auf der Grundlage von Phase I sind die gesuchten Informationen nach folgenden Gesichtspunkten zu definieren:

- *Sie stammen von der anfragenden Organisation*  
Welche Informationen? (Nähere Angaben erforderlich)
- *Sie stammen aus dem Land der betreffenden Organisation*  
Welche Informationen? (Nähere Angaben erforderlich)
- *Sie stammen aus anderen Ländern*  
Aus welchen? (Nähere Angaben erforderlich)  
Welche Informationen? (Nähere Angaben erforderlich)

Bitte tragen sie die Ergebnisse der Punkte 6, 7, 8 und 9 in Tabelle 2 ein.

## PHASE 2b: IDENTIFIZIERUNG DER IN FRAGE KOMMENDEN INFORMATIONSMQUELLEN

Unter Informationsquelle ist jede Art von Informationsträger zu verstehen, der Informationen enthält, die weitergegeben werden können: dabei kann es sich um eine Person handeln, die ihr Wissen weitergibt, um einen Gegenstand, ein Bild, eine Platte oder Kassette, ein Buch oder jedes andere geschriebene oder gedruckte Dokument.

Anhang 1 zu diesem Kapitel enthält eine kurzgefaßte Beschreibung der verschiedenen Kategorien von Informationsquellen.

Zur Bestimmung derjenigen unter ihnen, die aller Wahrscheinlichkeit nach die gesuchten Informationen enthalten, muß man den Kreis der in Frage kommenden Informationsquellen einengen.

### Warum eine solche Auswahl, bevor man mit den eigentlichen Nachforschungen beginnt?

Ein bestimmtes Wissen kann bei den unterschiedlichsten Arten von Informationsträgern (die wir hier "Quellen" nennen) vorhanden sein, die immer zahlreicher werden, je weiter sich die Informationstechnologien entwickeln, die uns Platten, Disketten, Magnetbänder, elektronische Zeitungen, usw. beschert haben.

Bei diesen verschiedenen Quellen sind die Informationen über dieses Wissen nach jeweils

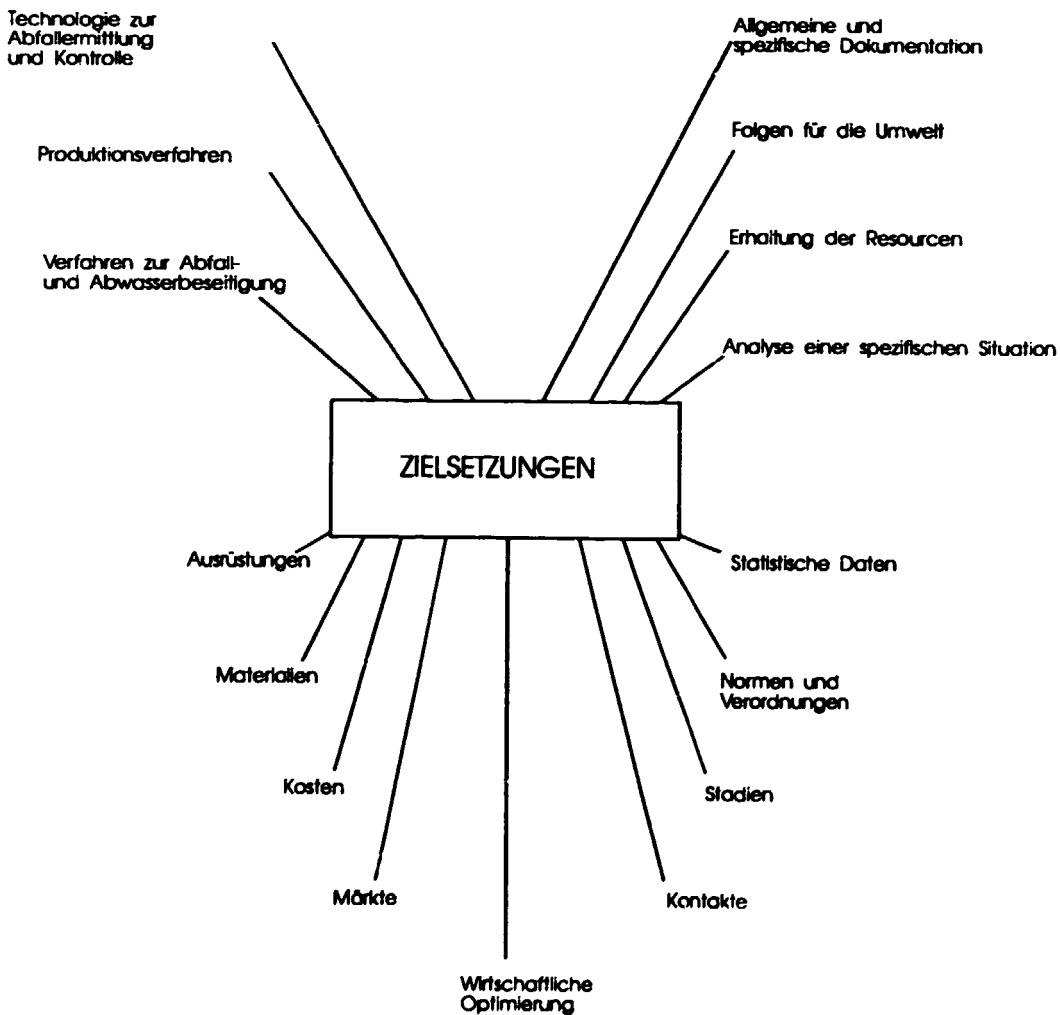


Bild 8 Zielsetzungen und Informationsanwendungen

anderen Gesichtspunkten zusammengestellt, da sie alle verschiedene Ziele verfolgen. Es müssen daher diejenigen Kategorien ausgewählt werden, deren Stoßrichtung der der gesuchten Informationen entspricht.

Die richtige Auswahl der Informationsquellen ist die Voraussetzung dafür, daß man Informationen, die dem Zweck der Anfrage entsprechen, ohne unnötige Verzögerung erhält.

#### **Wie geht man vor?**

Siehe Anhang 1

- Übertragen Sie die Daten aus Tabelle 2 in Tabelle 3;
- Wählen Sie entsprechend den Erkenntnissen aus Phase I für jedes einzelne Thema die Informationsquellen aus und tragen Sie sie in Tabelle 3 ein;
- Geben Sie anhand von Tabelle 2 ihren Ursprung an;

### **PHASE 3: AUSWAHL DER GEEIGNETSTEN INFORMATIONSQUELLEN**

Gehen Sie nach Abs. 3 vor.

- Nehmen Sie erneut die in Phase 2b ausgefüllte Tabelle 3 zur Hand;
  - Nehmen Sie sich nun die zuvor festgelegten Lieferbedingungen (Phase I, Abs. 5) vor, nämlich die Fristen, die zulässigen Gesamtkosten, die Zeit, die aufgewendet werden kann, und den gewünschte Genauigkeitsgrad der Informationen;
- Folgen Sie bei Ihrer Suche der Prioritätsreihung und gehen Sie dabei wie folgt vor.

#### **10. WELCHE INFORMATIONSQUELLEN SOLLEN AUSGEWÄHLT WERDEN?**

##### **10.1 SUCHEN SIE IN IHRER EIGENEN INSTITUTION NACH:**

- den in der Tabelle vermerkten internen Informationsquellen.
- nach externen Informationsquellen, die dort verzeichnet sind, vor allem wenn die Institution

über einen Dokumentationsdienst verfügt.

- Zeichnen Sie sie in der Tabelle an.
- Achten Sie darauf, daß die von Ihnen hierfür aufgewendete Zeit der Prioritätsstufe der gesuchten Information entspricht und im Einklang steht mit der für die Beschaffung sämtlicher Informationen zur Verfügung stehenden Zeit.

##### **10.2 SUCHEN SIE IN DEM LAND, IN DEM IHRE ORGANISATION TÄTIG IST:**

- nach den Informationslieferanten, die sich mit dem oder den Themen der gesuchten Informationen befassen;
- Wählen Sie sodann diejenigen aus, die die in der Tabelle beschriebenen Informationsquellen nutzen;
- Hinsichtlich letzterer ist zu definieren:
  - ihr Zweck,
  - was sie tun,
  - wie man an ihre Informationen herankommt,
  - zu welchen Bedingungen die Informationen verfügbar sind: Kosten, und das Verarbeitungsstadium der Dokumentation,
  - die Verlässlichkeit;

- Wählen Sie nun diejenigen aus, die dem, was sie suchen, am nächsten kommen;

- Zeichnen Sie in der Tabelle an, was bei diesen Organisationen an Informationen zu finden ist.

Die möglichen Informationslieferanten werden wie folgt ermittelt:

- durch Konsultation von Teil II des Handbuchs;
- durch Konsultation der Verzeichnisse;
- aufgrund der eigenen Erfahrung oder der Erfahrung von Kollegen.

##### **10.3 ZUSAMMENFASSUNG**

Nun sind zusammenzufassen:

- die Informationen, die möglicherweise in der eigenen Institution und im eigenen Land beschafft werden können;
- die mit ihrer Beschaffung verbundenen Kosten und Fristen;
- die Prioritäten, die eingehalten werden können;
- was fehlt, in der Reihenfolge der Wichtigkeit.

Ferner ist unter Beachtung der festgelegten Bedingungen abzuwägen welche Lieferanten



Ergebnisse von 7 in Tabelle 1 einfügen

THEMA	GEBIET												
	Feste Abfälle	Gasförmige Emissionen	Giftstoffe	- Chemikalien	- Reinigungsmittel	- Pestizide	- Düngemittel	- andere	Schwermetalle	Radioaktivität	Lärm	Gesundheit	...
Gesetzgebung Verordnungen Normen	b	3											
Folgen für die Umwelt Standortprobleme	b	2-3											
Analyse der Situation Numerische Daten	a-b c	3											
Technologie zur Messung und Kontrolle		3											
Verfahren zur Abfall- und Abwasserbeseitigung	a-b c	3											
Produktionsverfahren													
Produkte													
Ausrüstungen und Materialien	a-b												
Kosten Markte	a-b c	1-3											
Wirtschaftliche Optimierung													
Recycling	c												
Kontakte													
Ausbildungskurse													
Statistik													
...													

Bemerkung: Folgende Beispiele wurden angewandt für die:

- a Einrichtung einer städtischen Haushaltsmüllbeseitigung
  - b Wahl eines Systems zur Behandlung festen städtischen Mülls
  - c Einrichtung einer selektiven Müllabfuhr zur Wiederverwertung
1. Kosten einer Abwasseraufbereitungsanlage
  2. Örtliche Bestimmung für eine Abwasseraufbereitungsanlage
  3. Wahl einer Abwasseraufbereitungsanlage

Tabelle 1 Stufe 1: Informationen die gesucht werden

nach reiflicher Prüfung konsultiert werden sollen und ob es sinnvoll ist, nach weiteren Lieferanten zu suchen.

#### **10.4 SUCHE NACH ANDEREN INFORMATIONSLIEFERANTEN**

Wenn sich herausstellt, daß weitere Informationsdienste in Anspruch genommen werden müssen:

- sollte mit der Suche bei internationalen Organisationen begonnen werden, und zwar nach dem für nationale Informationslieferanten angegebenen Verfahren (Punkt 2 oben);
- ist wie oben beschrieben eine Zusammenfassung vorzunehmen (Punkt 3 oben);
- Wenn nötig sind auf dieselbe Weise Informationslieferanten im Ausland zu suchen, die nach der Herkunft der gesuchten Informationen auszusuchen sind.

Die Suche nach diesen Organisationen erfolgt auf dieselbe Weise wie für "nationale Informationslieferanten" (Punkt 2 oben).

### **11. VORGANGSWEISE BEI DER KONSULTATION DER AUSGEWÄHLTEN INFORMATIONSLIEFERANTEN**

#### **11.1 ERSTELLUNG DER LISTE DER ZU KON-**

#### **SULTIERENDEN ORGANISATIONEN**

Nehmen Sie Tabelle 3 zur Hand und führen Sie für jede einzelne Organisation folgendes an:

- die Informationen, die Sie sich von dort erwarten;
- die dort bearbeiteten Informationsquellen;
- die gewählte Art der Abfrage;
- die mögliche Frist;
- die geographische und die Postadresse;
- das Datum der Konsultation.

#### **11.2 KONSULTIEREN SIE DIE EINZELNEN ORGANISATIONEN**

Dabei ist anzugeben:

- der verfolgte Zweck, d.h. warum man die Informationen sucht;
- welche Informationen man erwartet und die gesuchten Quellen;
- die Informationen, über die man bereits verfügt;
- die gewünschten Einzelheiten;
- die möglichen Fristen;
- die Art, wie man sich über die Kosten verständigt.

#### **11.3 ÜBERPRÜFEN SIE DEN EINGANG DER ANTWORTEN**





# SCHLUSSFOLGERUNGEN

Mit der vorgeschlagenen Methode können die in der Einleitung genannten Informationsprobleme gelöst werden. Sie gestatten es, sich mit einem Höchstmaß an Effizienz und unter den günstigsten Voraussetzungen hinsichtlich der Kosten und der erforderlichen Zeit zu informieren.

Es könnte sein, daß einem Ingenieur Zweifel kommen, ob die Methode auch sinnvoll ist, und er sich fragt, ob sie nicht zu kompliziert ist. Wir meinen, daß die Vorgehensweise denkbar einfach ist und daß die Methode nur deshalb kompliziert erscheint, weil genauestens analysiert werden muß, wozu man Informationen benötigt. Diese Analyse erleichtert die Informationsbeschaffung, da man sich dadurch auf das Wesentliche beschränken kann.

Eine scheinbare Schwierigkeit besteht darin, daß die Auswahl der Informationen und Informationslieferanten nach strengen Gesichtspunkten zu erfolgen hat. Im Grunde genommen bedeutet dies jedoch nur eine Umstellung der bisher geübten Praxis zur Informationsbeschaffung.

Die meisten Ingenieure sind es zwar gewohnt, ihre Lieferanten nach strengen Kriterien auszuwählen, lassen diesen Grundsatz aber außer acht, wenn es um die Beschaffung von Informationen geht. Sie richten ihre Anfragen nur an Quellen, die sie kennen, erklären nur ungenau, was sie wollen, und verlieren meist viel Zeit mit mehr oder weniger vom Zufall diktierten Nachforschungen.

Deshalb ist zur Anwendung dieser Methode ein gewisses Training notwendig, da die Gewohnheiten geändert und die erforderlichen Reflexe angeleitet werden müssen. Das geht sehr schnell.

Ist die Methode in allen Fällen gerechtfertigt? Eine Analyse dessen, was man erreichen will, die ja die Basis der Methode ist, muß in jedem Fall angestellt werden, ganz gleich, welche Informationen man sucht.

Eine solche Analyse spart Zeit und verhindert, daß man die Dinge dem Zufall überläßt. Oft macht sie sogar die Informationsbeschaffung überflüssig.

Die Methode ist auch dann angezeigt, wenn der Ingenieur ohnehin weiß, an welche Stelle er sich wenden muß. Für den betreffenden Fall gibt es nämlich meist andere, oft noch besser geeignete Informationsmöglichkeiten, die ihm unbekannt sind.

Die Methode ist unerläßlich, wenn man ein Verzeichnis benützt.

Die Methode geht von dem Zeitrahmen aus, über den man für die Informationsbeschaffung für den betreffenden Zweck verfügt. Die Methode wird umso einfacher durchzuführen sein, je einfacher der Zweck ist, dem die zu beschaffenden Informationen dienen und für den man nur wenig Zeit aufwenden will. Im Gegensatz hierzu wird man sorgfältig Schritt für Schritt vorgehen, wenn es sich um ein kompliziertes Vorhaben handelt, zu dessen Verwirklichung die Informationsbeschaffung einen erheblichen Beitrag leistet.

# ANHANG 1

## AUSWAHL DES INFORMATIONSTRÄGERS nach dem verfolgten Zweck

### Ein Buch?

Um die Grundlagen der Technik kennenzulernen.  
Um die Folgen von Abfallstoffen mit oder ohne Filterung kennenzulernen.

### Eine Zeitschrift?

Um sich über den neuesten Stand zu informieren – neue Verfahrensweisen, Konkurrenzsituation usw.

### Ein Bericht?

Um eventuelle Verbesserungen und Lösungen im Hinblick auf neue Erfahrungen und neue Erkenntnisse z. B. durch die Einführung neuer Materialien zu ermitteln.

### Ein Gesetzestext?

Um Sicherheitsbestimmungen zu ermitteln.

### Normen?

Um die technische Beschreibung oder Materialdimensionen in Erfahrung zu bringen.  
Um Wirtschaftlichkeitsgrenzen bezüglich der Menge und der Lebensdauer eines Abfallproduktes in Erfahrung zu bringen.

*Welches ist für mich  
die beste  
Filterwahl?*

### Ein Patent?

Um Informationen über eine neue Erfindung zu ermitteln und um zu prüfen ob ein Patent verbessert werden kann.

### Firmenprospekte?

Um Informationen über die auf den Markt erhältlichen Modelle zu erhalten, ihre Eigenschaften, Kapazitäten und Preise in Erfahrung zu bringen.

### Numerische Datenbank?

Um bestimmte Eigenschaften zu errechnen oder die Marktsituation auswerten zu können.

### Ein Muster?

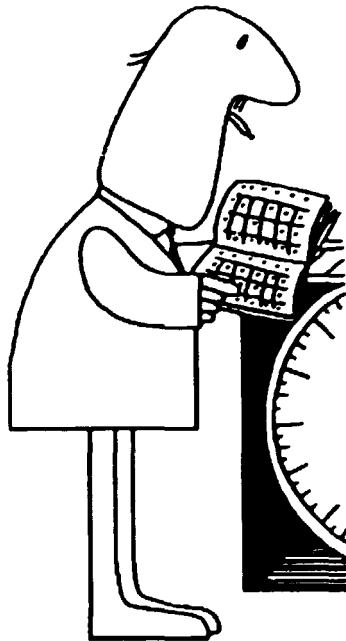
Um das Design des Modells kennenzulernen.

### Ein Experte?

Zur Beratung über die Wahl eines Filters, seine Installation und spezifischen Merkmale.

### Ein Computerprogramm?

Zur Unterstützung bei der Berechnung und der Gestaltung eines neuen Filters.



Quelle: Adaptiert nach "La gestion de l'information dans l'entreprise",  
A. DAVID & E. SUTTER, AFNOR, Ed. AYROLLES, 1985, S. 64

# ANHANG 2

## KATEGORIEN VON INFORMATIONSLIEFERANTEN

Die Informationslieferanten lassen sich nach ihrem jeweiligen Auftrag in folgende vier Kategorien einteilen:

- Nach dem Bereich, in dem ein Ingenieur in einer Organisation tätig ist;
- Nach den Gruppen, mit denen seine Organisation zusammenarbeitet;
- Die eigentlichen Informationslieferanten;
- Verwaltungsdienststellen.

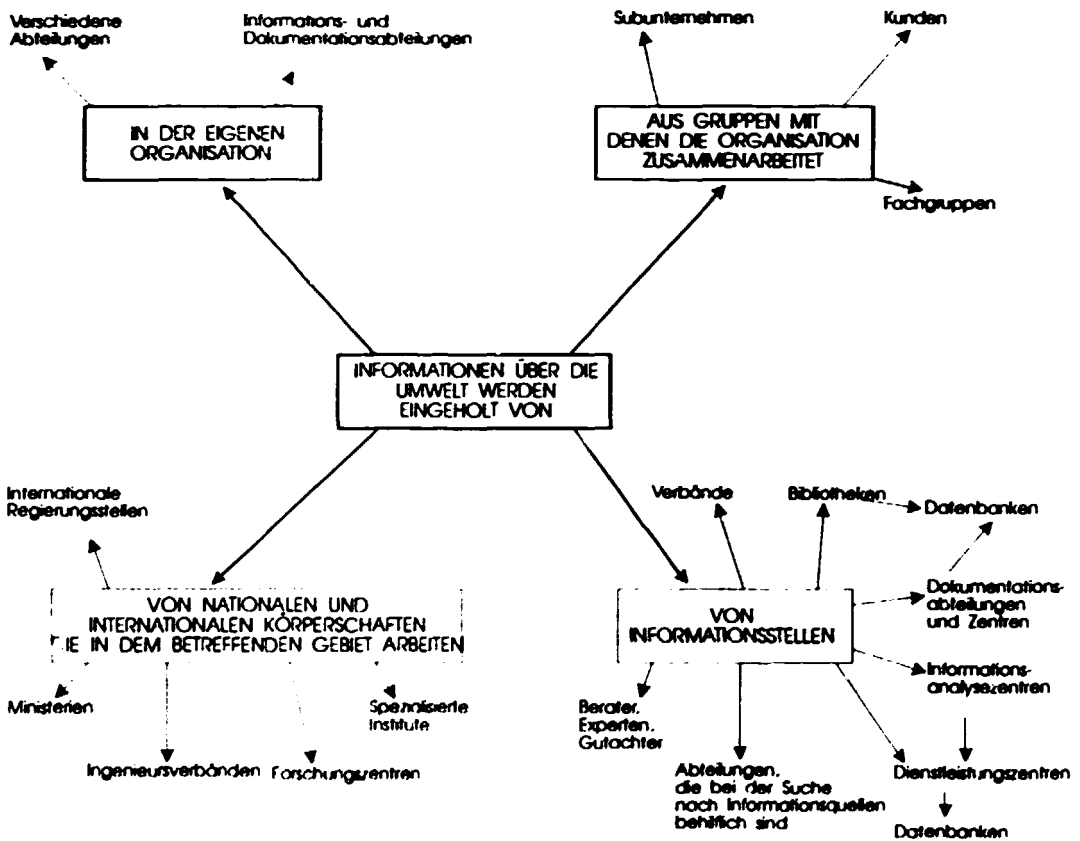


Abb. 9 Die Kategorien von Informationslieferanten

- **Bibliotheken**

Diese Einrichtungen verfolgen im Rahmen ihres auf die Sammlung von Schriften gerichteten Auftrags unterschiedliche Ziele. Diese sollte man kennen, um zu wissen, an welche von ihnen man sich sinnvollerweise wendet. Hier ist zu unterscheiden zwischen

- der Art der Informationsmedien oder -träger: Schriften, Platten, Magnetbänder, Film, Gegenstände;
  - der Art der Schriftstücke: Bibliotheken spezialisieren sich z.B. auf Bücher und Zeitschriften, auf Forschungsberichte oder Patente;
  - dem Auftrag der Erhaltung: Archive, Nationalbibliotheken, nationale Fachbibliotheken, nationale Patentämter, oder aber städtische Büchereien oder Leihbibliotheken in Betrieben und Schulen;
  - dem betreffenden Fachbereich: die einen spezialisieren sich auf ein spezielles Wissensgebiet, andere wieder decken verschiedene Bereiche ab;
  - den von den Bibliotheken angesprochenen Zielgruppen.
- **Dokumentationsdienste und -zentren**  
Ihre Aufgabe ist es, die in den Dokumenten enthaltenen Informationen zu beschreiben und dem betreffenden Dokument zuzuordnen. Auch sie unterscheiden sich nach
  - der Art der Dokumente, die verzeichnet sind. Manche Zentren sammeln alle Arten von Dokumenten, andere wieder beschränken sich auf bestimmte Kategorien;
  - dem (den) Tätigkeitsbereich(en), je nachdem, ob ein Zentrum einen bestimmten Auftrag erfüllt oder sich einem konkreten Wissensgebiet widmet;
  - ihren Aufgaben und Dienstleistungen;
  - Zielgruppe und Zugang. Die Zentren können

- international sein (wenn sie für mehrere Länder eingerichtet und organisiert wurden)

- national sein (wenn sie ihren Auftrag für ein Land erfüllen)

- berufsorientiert sein (wenn sie den Bedürfnissen eines Berufsstandes entsprechen)

- individuell für eine Organisation tätig sein.

- **Zentren für die Analyse von Informationen**

Ihr Ziel ist es, den Inhalt von Dokumenten auszuwerten, um bedarfsspezifische Informationen liefern zu können. Sie beantworten Informationersuchen, veröffentlichen Zusammenfassungen und numerische oder faktenbezogene Datenbanken.

Sie unterscheiden sich ebenfalls nach den oben beschriebenen Gesichtspunkten.

- **Verteilungszentren**

Sie sammeln bibliographische, numerische und faktenbezogene Datenbanken und stellen sie für Fernabfrage zur Verfügung.

Beratungsdienste, die über Informationsquellen informieren

- **Verbände von Vereinigungen oder Experten, die die Verbindung zu "lebenden" Informationsquellen (Beratern, Sachverständigen, Konsulenten) herstellen können, etwa Berufsverbände, Vereine, Forschungszentren oder Fachinstitute.**

Diese Verbände verfügen oft selbst über Informationsdienste, die Auskunft über weitere Informationsquellen geben können (siehe vorhergehende Kategorie).

Es gibt schließlich auch nationale Verzeichnisse von Verbänden, in die man in Dokumentations- und Informationsdiensten der wichtigsten zuständigen Verwaltungsdienststellen Einsicht nehmen kann.



# INTRODUCCIÓN

Todo ingeniero, todo actor del desarrollo industrial, cualquiera que sea su esfera de actividad y la función que desempeñe, se enfrenta, o algún día se enfrentará, con problemas de medio ambiente.

¿Cuáles son las técnicas apropiadas para combatir determinado tipo de contaminación? ¿Cuáles serán las consecuencias para el medio ambiente del empleo de una determinada tecnología nueva? ¿Qué procedimientos permiten mejorar el ambiente interior de los establecimientos de producción? ¿Cuáles son los criterios que, desde el punto de vista del medio ambiente, deberán tenerse en cuenta al idear un producto, al establecer una empresa industrial, al construir edificios o al construir una presa? ¿Cuáles son las normas sobre residuos que han de imponerse a un establecimiento industrial? ¿Cuáles son los daños, a corto y a largo plazo, que pueden ocasionar los elementos utilizados en los procesos de producción y fabricación? ¿Cómo planear su disminución (ahorros de agua, energía, materias primas, etc.)? ¿Cómo gestionar los residuos tóxicos producidos (teniendo en cuenta la vida útil de funcionamiento o la durabilidad de los productos y aquellos otros que se hayan quedado obsoletos)?

¿Cuál es el costo, el precio de fábrica, o la ventaja de una determinada medida de protección del medio ambiente, frente a la competencia?

Estos ejemplos dan idea de las muy diversas preocupaciones que pueden asaltar a los ingenieros en el curso de su actividad profesional. Para unos, las preocupaciones tendrán un carácter excepcional; para otros, en cambio, serán cosa habitual.

En todos los casos, se tratará de problemas muy concretos que precisarán información de diversa índole, también concreta, apropiada al caso, organismo al que se le planteen y al país de que se trate.

Además, las relaciones entre la actividad industrial y sus efectos en el medio ambiente

natural, así como en las sociedades humanas, son complejas y se extienden a múltiples campos.

En esas condiciones, ¿cómo analizar su propio caso? ¿Cómo determinar los campos o esferas con los que tenga relación? ¿Qué información es preciso elegir?

Es imprescindible un método para orientar al ingeniero en la búsqueda de información pertinente para resolver el problema específico que se le plantee, y ello, más concretamente, porque:

- El análisis de cada caso es complejo. En vista de ello, ¿Cuáles son los factores a considerar? ¿Cómo evaluarlos?
  - El concepto del medio ambiente no es muy claro. Por su carácter interdisciplinario, es susceptible de interferirse en todos los campos del conocimiento y esferas de actividad. Pero entonces, ¿cuáles elegir? ¿Con arreglo a qué criterios? ¿Cómo?
  - La protección del medio ambiente interesa a todos los países y concierne a todas las actividades. De ello se sigue que los medios de información, así como las entidades proveedores de ella, son numerosos y se hallan dispersos por el mundo. ¿Cómo conocerlos o buscarlos? ¿Cómo elegirlos para obtener la información que se precise?
  - Los progresos de las tecnologías de la información permiten desarrollar y crear modalidades de acceso a informaciones numerosas y diversificadas. ¿Cómo conocer esos medios y cómo elegirlos en función de lo que se esté buscando?
  - La esfera del medio ambiente es de tal naturaleza que la explosión informativa lleva, en consecuencia, o bien a una información insuficiente o bien a un exceso de ella, si no se dispone de un método para orientarse al elegirla.
- La presente *Gula*, dividida en dos partes, tiene por objeto orientar al ingeniero en su búsqueda de información:
- a) Ayudándole a situar y analizar su propio caso, las condiciones en las cuales se plantea su

problema, y los objetivos que determinan su necesidad de información<sup>1</sup> (capítulo I de la primera parte);

b) Proponiéndole un método para identificar la información útil y buscarla (capítulo II de la

primera parte); y

c) Proponiéndole una lista de medios o de proveedores de información a los que pueda consultar (segunda parte).

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<sup>1</sup>Los ingenieros especialistas del medio ambiente conocen por lo general en su conjunto el problema que han de resolver, y saben si existe información a tal fin y dónde encontrarla. En este caso, la Guía les ayudará a orientarse en la búsqueda de la información complementaria que precisen. Tales ingenieros no necesitan seguir puntualmente el resto del método.

## **PRIMERA PARTE**

### **MÉTODO**

**Cómo informarse sobre el medio ambiente  
en relación con un proceso industrial**

# CAPÍTULO 1

## ANÁLISIS DEL PROBLEMA A RESOLVER — Labor previa a la búsqueda de información

### EL PRINCIPIO DEL DIAGNÓSTICO

Para informarse se requiere, ante todo, un diagnóstico y un análisis del problema a resolver. La necesidad de información sobre el medio ambiente se expresa siempre mediante una acción determinada que debe definirse y evaluarse antes de iniciar la búsqueda de información. En primer lugar, es preciso saber qué es lo que se va a hacer con la información que se pretende buscar.

El método de búsqueda de información sobre el medio ambiente se basa en la identificación precisa del objetivo fijado:

- ¿Cuál es el objetivo? ¿Con qué finalidad desea obtenerse la información?
- ¿Cuál es la organización pertinente?
- ¿Cuáles son las condiciones en que se plantea precisamente el problema de contaminación o de protección del medio ambiente?
- ¿Cuáles son las consecuencias de este problema?
- ¿Cuáles son las condiciones concretas de la utilización de la información deseada? ¿Quién está involucrado?

Conviene señalar que el ingeniero que busca información sobre el medio ambiente participa, la mayor parte del tiempo y cualquiera que sea el organismo u entidad a que pertenezca, en una actividad colectiva. La búsqueda de información que emprende es también colectiva. El método propuesto, basado en el análisis de la actividad para la que se busca información, es aplicable tanto por una persona que trabaje aisladamente como por un equipo. Se trata, pues, de una *Guía* para todos.

Conviene señalar igualmente que esta *Guía* también está destinada tanto a los especialistas como a los no especialistas del medio ambiente, así como a los especialistas de la información.

Los especialistas del medio ambiente, ingenieros que diariamente se enfrentan con problemas de efectos de las tecnologías en el medio ambiente, de aplicación de procesos industriales, de gestión de productos o residuos, de capacitación, etc., utilizarán la *Guía* para confirmar o completar una información de la que ya disponen. Cada cual juzgará entonces, en función de su caso concreto, en qué medida les será útil aplicar todo o parte del método.

Los no especialistas del medio ambiente, ingenieros que se enfrentan a un problema del medio ambiente en forma ocasional, para la redacción de un informe sobre un producto, tecnología, estudio de viabilidad, proyecto de implantación, aplicación de reglamentaciones, etc., lo utilizarán para encontrar, organizar y aprovechar la información que necesiten para alcanzar su objetivo.

Los especialistas de la información la utilizarán para responder a una solicitud de información cursada por un ingeniero que tenga un problema de medio ambiente. La *Guía* permitirá al ingeniero analizar con precisión su propio caso y ponerlo en conocimiento de quien recabe la información; a este último le permitirá concretar los datos que le falten sobre el caso en cuestión, dedicarse seguidamente a buscar la información y proporcionársela al primero de acuerdo con las condiciones estipuladas en la solicitud.

La *Guía* es un instrumento de diálogo entre el solicitante y el proveedor, y permite evitar errores de interpretación, pérdidas de tiempo o falta de confianza en la información facilitada; en otras palabras: permite conseguir la mejor relación calidad-precio.

Conviene señalar que esta *Guía* representa también, para el ingeniero, una ayuda directa para llevar a cabo, en las mejores condiciones, la ac-

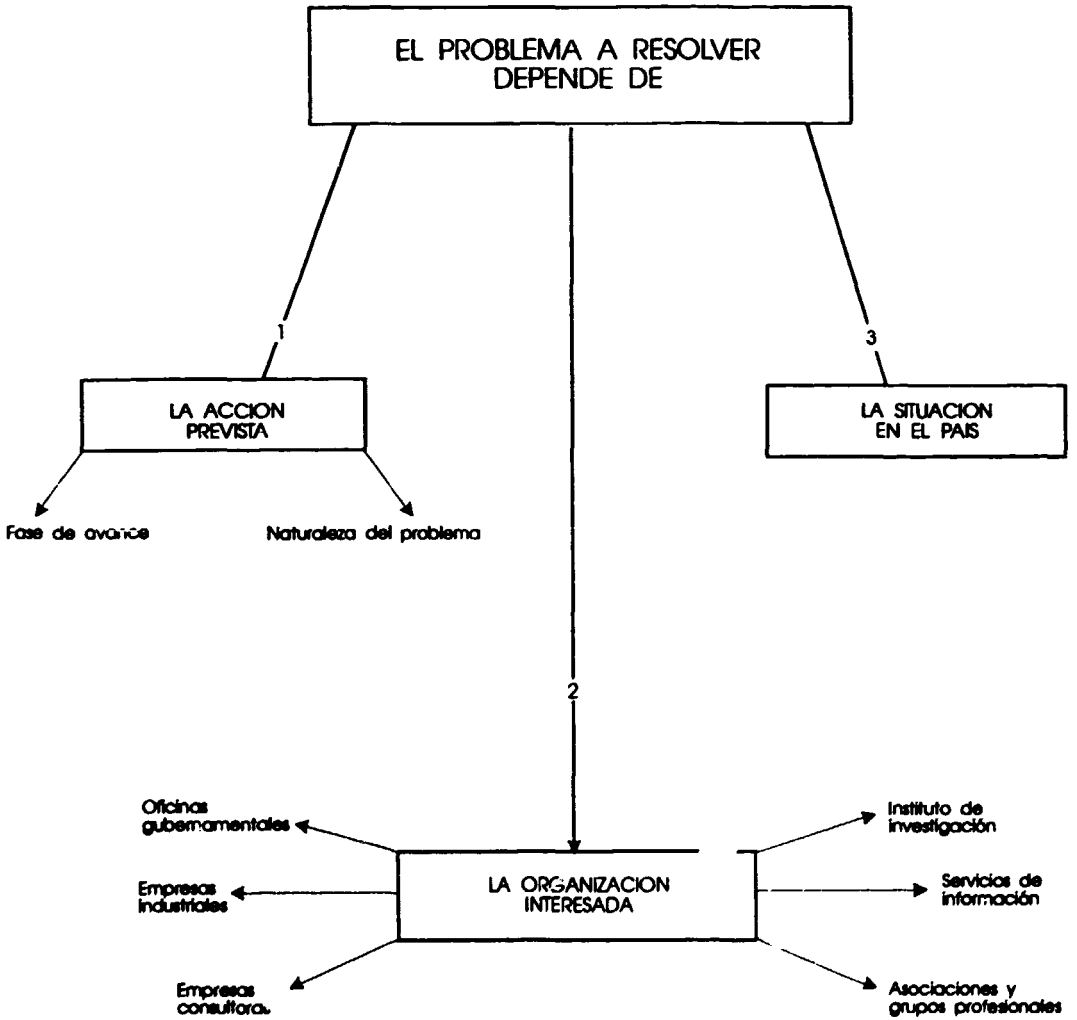


Figura 1 Elementos de diagnóstico

tividad que emprenda. En efecto:

- El diagnóstico preciso de la actividad a realizar, de sus objetivos y de sus consecuencias, gracias al plan propuesto, condiciona el éxito de esa actividad;
- El disponer de información fiable, y al menor costo, para la actividad que haya que emprender reduce los riesgos de error y de pérdida de tiempo, permite utilizar lo que existe y limitar el tiempo de intervención a lo justamente necesario.

El resultado de ello es una reducción de los costos, del precio de fábrica del producto a realizar y, por tanto, el logro de economías para la entidad que realice esa actividad.

El diagnóstico del problema a resolver consiste en definir (figura 1):

1) La actividad prevista. La fase en que se encuentra: ¿a qué punto se ha llegado? El objeto: ¿de qué se trata?;

2) La naturaleza de la entidad en cuestión, estableciendo una distinción — pues sus objetivos son diferentes — entre empresas, oficinas de diseño, administraciones, institutos de investigación, establecimientos de enseñanza y establecimientos de información;

3) La situación del país. Para facilitar el diagnóstico de una determinada situación, presentamos figuras tipo en este capítulo de casos. También explicamos en qué y por qué difieren las necesidades de información según las entidades (cuyos objetivos no son idénticos).

Asimismo, ponemos de manifiesto la diferencia que va de un país a otro en cuanto a necesidades de información, en el caso de actividades idénticas, por diferir sus políticas de protección del medio ambiente.

Los elementos que caracterizan una actividad dada, un problema a resolver, es decir, una necesidad de información — determinada a base de los textos siguientes — figuran en el método de búsqueda que proponemos en el capítulo II.

## 1. ¿CUÁL ES LA ACTIVIDAD PREVISTA?

Para determinar las características de una actividad o actuación prevista o del problema a

resolver, es preciso saber en qué situación se está y cuál es la naturaleza del problema (figura 2).

### 1.1 ¿CUÁL ES LA SITUACIÓN?

Para toda actividad, es necesario adoptar un procedimiento lógico. Este procedimiento consiste en estudiar la viabilidad de esa actividad y su realización, y en darla a conocer.

El procedimiento puede desdoblarse en cinco etapas, que requieren diferente información sobre la actividad prevista y, posiblemente, medios de información también diferentes. Esas etapas son:

- La decisión (examen, previsiones, evaluación de riesgos, situación económica, etc.);
- La exploración (situaciones existentes, proyectos, etc.);
- La realización (desarrollo, fabricación, etc.);
- La difusión (por escrito u oralmente);
- La innovación y la concepción.

### 1.2 ¿CUÁL ES LA NATURALEZA DEL PROBLEMA?

Los ingenieros que se enfrentan con problemas de medio ambiente pueden estar desarrollando, directa o indirectamente, una o varias de las siguientes actividades típicas:

- Reglamentar actividades humanas y sus efectos en el medio ambiente;
- Ordenar el medio ambiente: legislar, controlar, establecer normas, establecer o consolidar estadísticas;
- Prevenir uno o más problemas de alteración cualitativa o cambio cuantitativo de un recurso natural y, mediante ello, comprender los procesos de evolución del medio ambiente;
- Asegurar la optimización económica, reduciendo la contaminación y respetando la reglamentación correspondiente;
- Desarrollar un nuevo producto, procedimiento o mercado;
- Obtener información sobre la relación actividad humana-medio ambiente;
- Proporcionar capacitación a personal sobre los problemas del medio ambiente relacionados con las actividades industriales y el desarrollo en general (incluidos el desarrollo agrícola y el urbano).

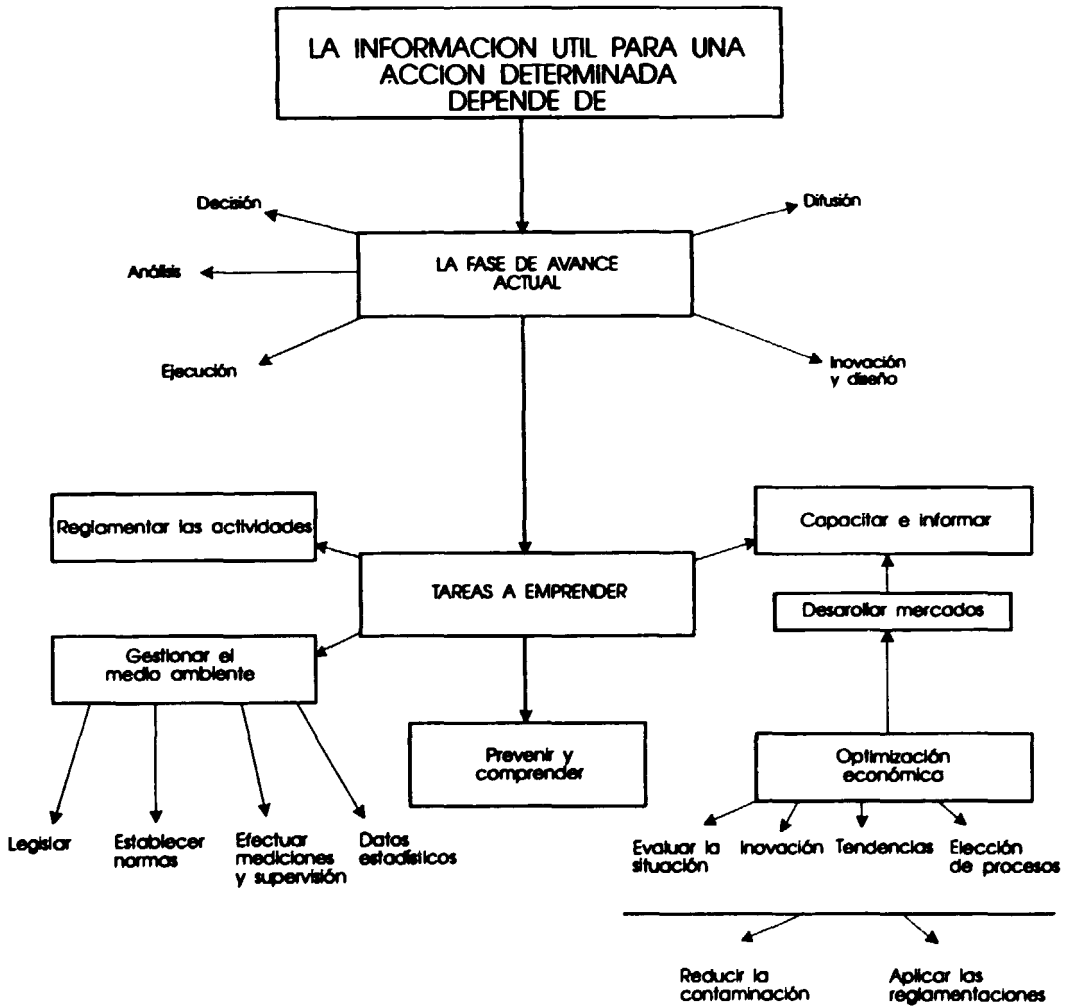


Figura 2 Características de las medidas previstas

Esas son actividades normales para la protección del medio ambiente.

Tales actividades difieren, sin embargo, por sus objetivos y, en consecuencia, por la información que para ellas se necesita (véase la figura 2).

#### *a) Reglamentar las actividades y sus efectos*

Las administraciones se encargan de establecer reglamentaciones que rijan la actividad de los explotadores, tanto a nivel de industria como de colectividades locales, urbanas o rurales.

Una opinión pública consciente de un problema ambiental concreto (contaminación accidental, deterioro del paisaje o de la calidad de vida, etc.) recurre a esos reglamentos y puede intervenir para lograr que sean tenidos plenamente en cuenta y aplicados para la conservación del medio ambiente.

Esta acción genera varias necesidades:

- Datos numéricos (estadísticos), respaldados por datos puntuales, síntesis, etc.);
- Normas, reglamentaciones y proyectos de reglamentaciones, análisis, etc., que permitan realizar informes actualizados sobre una determinada situación del medio ambiente, la naturaleza de los problemas así revelados, su dinámica y la forma en que puedan resolverse o disminuirse.

#### *b) Ordenar el medio ambiente*

La ordenación del medio ambiente es tanto una cuestión económica como política. Los responsables de un país aseguran, sobre todo mediante la utilización racional y armoniosa del espacio, la conservación del patrimonio nacional (tanto en términos de calidad como de cantidad).

El porvenir económico de un país depende de la utilización racional de sus recursos naturales.

En general, cuando las actividades técnicas están directamente relacionadas con la protección y rehabilitación del medio ambiente, los ingenieros precisan información para:

- Conocer la toxicidad de las materias primas utilizadas o de los productos fabricados;
- reducir o modificar los residuos y desechos;
- limitar o eliminar sus efectos en el medio ambiente;
- proteger el medio ambiente natural elaboran-

do y aplicando reglamentaciones (de gestión de residuos, de urbanismo, etc.);

- mejorar la calidad de vida mediante el control de los perjuicios al medio;
- efectuar mediciones para controlar los contaminantes y los factores de perjuicio.

Más concretamente, la gestión del medio entraña otros tipos de actividades complementarias.

#### *Legislar*

En el caso de los gobiernos encargados de legislar y de reglamentar para las empresas que deban aplicar la legislación en vigor, la calidad de la información es de importancia clave. Esta información puede referirse:

- Al conocimiento de los niveles admisibles de contaminación del medio ambiente, de las normas relativas a los desechos y a las emisiones, etc.;
- Conocimiento de la naturaleza y cantidad de los contaminantes producidos por la actividad industrial, agrícola y urbana, etc.;
- Conocimiento de la posibilidad de modificar los flujos de contaminación en sus respectivos países y en otros, etc.;
- Conocimiento de la protección de los medios naturales frágiles y de los paisajes frente a presiones poderosas (agricultura intensiva, turismo, desarrollo de infraestructuras, etc.).

#### *Establecer normas*

Las normas y las reglamentaciones son la expresión de los poderes públicos y de la industria para resolver los problemas relacionados con la protección del medio ambiente. Tales normas y reglamentaciones son propias de cada país, y se elaboran mediante un análisis de los riesgos, para la población y el medio ambiente, comparado con el análisis de las consecuencias de la prevención de tales riesgos para la situación de la industria y para desarrollo.

La información buscada se refiere, más concretamente:

- Al conocimiento previo de las normas aplicadas en otros países o reconocidas por organizaciones internacionales;
- A los datos científicos, tecnológicos y sociales



en que se basan esas normas;

- A los datos sobre las condiciones locales que permitan adaptar al contexto local normas procedentes de fuentes externas.

#### *Efectuar mediciones y controles*

Para preparar y establecer instalaciones de medición, y controlar los resultados, el ingeniero precisa información sobre:

- Los métodos de medición y de control de la contaminación dentro de los establecimientos y fuera de ellos;
- Las normas admisibles para productos contaminantes presentes en los desechos y emisiones, dentro y fuera de las instalaciones;
- Las tecnologías a utilizar para reducir la contaminación.

#### *Reunir o completar datos numéricos para la vigilancia del medio ambiente*

Las administraciones tienen necesidad de recoger datos relativos a los efectos, en el medio ambiente, de las actividades industriales actuales o proyectadas, del crecimiento urbano o del éxodo rural, del desarrollo de una agricultura intensiva, etc.

A tal fin, los ingenieros utilizan los estudios y las fuentes de datos sobre los efectos de los productos y de los procesos, las causas y las consecuencias de las medidas adoptadas o que puedan adoptarse. En un contexto financiero difícil, tales ingenieros recurren a entidades análogas a las suyas de otros países. También recurren a consultores de organizaciones internacionales para realizar informes básicos de la situación actual de los países (o regiones) donde estén trabajando.

#### *c) Prevenir y comprender los problemas relativos a la calidad del medio ambiente*

Cuando la actividad industrial es susceptible de modificar el medio ambiente, la necesidad de información se deja sentir cada vez con mayor antelación al proceso de conceptualización, de estudio inicial y de realización de un producto o proceso.

La necesidad de información se inserta entonces en el contexto de una reflexión global que abarca el producto y la tecnología: desde su concepción (y, por tanto, desde la demanda del mercado)

hasta sus efectos previsibles en el medio ambiente (es decir, desde la producción hasta la utilización).

Este proceso favorece la invención y la innovación. La rentabilidad económica del producto puede aumentarse mediante la supresión, la modificación o la reutilización (reciclaje) de ciertos circuitos.

Este objetivo exige asimismo la búsqueda de información, y un marco legislativo que permita realizarla antes de obtener la autorización para fabricar y distribuir los productos. La información pertinente se refiere al tipo, amplitud y efectos a largo plazo, o remanentes, de la toxicidad, en el hombre y en el medio ambiente, de los elementos utilizados en los diversos procesos.

Es más fácil resolver un problema de contaminación de fuente única, y por tanto bien localizado (tanto más si el problema es abordado antes de la implantación y la puesta en marcha del establecimiento industrial), que controlar contaminantes de fuentes difusas y formas de transmisión poco o mal conocidas. Las administraciones, las empresas y las oficinas de diseño tienen, todas ellas, necesidad de información con ese fin.

Análogamente, los problemas de transporte o de traslado de productos peligrosos se salen del marco de la empresa comercial e incumben a la política de gestión y de prevención de los gobiernos.

#### *d) Lograr la optimización económica de la actividad industrial*

Ese es el principal objetivo de la actividad industrial. Está, por tanto, necesariamente asociado a las preocupaciones de la industria por proteger el medio ambiente, y, en consecuencia, a la información que se proporciona a estos dos sectores.

En general, la búsqueda de la mayor rentabilidad requiere información para:

- Examinar la situación: evaluar los efectos; evaluar los costos de producción;
- Innovar: modificar o mejorar un proceso de fabricación; establecer nuevas instalaciones;
- Determinar las tendencias: evaluación de las

consecuencias de una situación actual; identificación de posibilidades de mejora con objeto de obtener procesos más eficientes y menos contaminantes; efectos de la evolución de las normas en los procesos en curso y en los productos utilizados;

- Elegir un proceso: costo de establecimiento; posibles economías, ventajas en el mercado, futuro.

Más concretamente, la protección del medio ambiente supone la adopción de una o varias de las medidas que a continuación se indican:

#### *Reducir la contaminación*

La aplicación de métodos para reducir residuos, desechos, etc., puede permitir la obtención de ahorros en el proceso de producción (ahorro de energía, por ejemplo). La gestión de la producción llega a ser, por tanto, más eficaz.

El reciclaje y el tratamiento permiten multiplicar los mercados, aumentar la productividad y reducir las inversiones necesarias para el control y la eliminación o evacuación de residuos al final del proceso.

En muchos casos, el empleo de técnicas no contaminantes ha resultado ventajoso tanto para el público como para la industria.

Con este objetivo, las empresas buscan información, productos, tecnologías, materiales y equipo, a fin de poder actuar en la fase de concepción y en la fase posterior a la fabricación del producto.

#### *Aplicar la reglamentación*

Las normas ambientales a respetar, que pueden figurar en las especificaciones y en la reglamentación en vigor, proporcionan dos tipos de información:

- Son compulsivas y pueden tener fuerza de ley; por ello, son susceptibles de ser impuestas actualmente o en un futuro próximo. Asimismo, es necesario conocerlas para poder respetarlas;
- Son una fuente de información para quienes deseen conocer los límites aceptables de determinados residuos o desechos, sus efectos y sus riesgos.

Pero tales normas no constituyen, en sí,

limitaciones: es su uso el que conduce a esta situación.

Todo industrial, todo representante de una colectividad local, o toda autoridad territorial, precisa información sobre:

- Lo que cuesta adaptarse a una norma;
- Cómo realizar esa adaptación con el menor costo, o incluso con beneficio.

El empleo de tecnologías y de procesos industriales que respeten los principios de protección del medio ambiente (ahorro de energía y recursos, reducción de la contaminación, reciclaje) permite a las empresas ser más económicas y más rentables. Numerosos ejemplos lo demuestran.

Estas aplicaciones originan necesidades de información en las empresas correspondientes. Más concretamente, tales empresas necesitan:

- Información sobre nuevas tecnologías;
- Información sobre las tasas de residuos y desechos contaminantes originados por los procesos disponibles;
- Información sobre la recuperación y el reciclaje de residuos durante el proceso de fabricación y en la fase final.

#### *Crear nuevos mercados para nuevos productos o procesos*

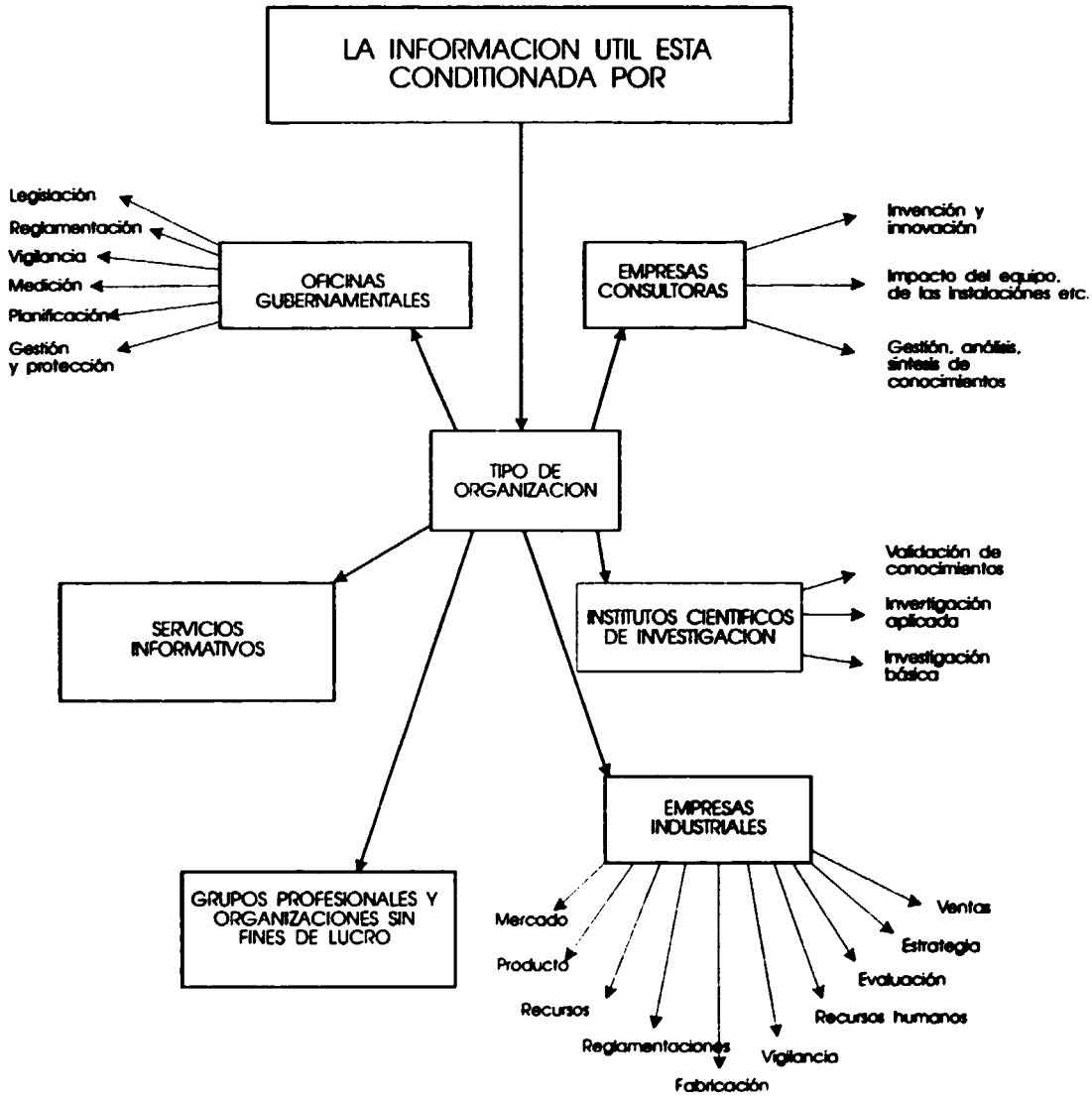
Las innovaciones en este sector tienen un enorme potencial comercial, ya se trate de procesos no perjudiciales para el medio ambiente o de equipo de medición, de control o de reducción de la contaminación.

Ante el aumento de los problemas ambientales y su complejidad cada vez mayor, la industria habrá de hallar o adoptar soluciones técnicas aceptables tanto a nivel ecológico como a nivel económico. Por ejemplo, esas soluciones pueden referirse a la producción y gestión de residuos tóxicos, así como a la prevención de accidentes industriales (evaluación de riesgos).

La información que ha de buscarse concierne más concretamente a:

- Los mercados;
- Las patentes;
- Los procesos y tecnologías "limpios".

Esta actividad está relacionada con los estudios



**Figura 3 Categorías de organizaciones y sus actividades**

de prospectiva y con los análisis del mercado a medio y a largo plazo.

*e) Transmitir conocimientos: capacitar o informar*  
El intercambio y la comunicación de información están en función de:

- La demanda de información (más o menos bien formulada);
- La oferta de información (por parte de un servicio, de una persona o de una entidad);
- Transmisión de la información habilitada entre la entidad solicitante y la entidad proveedora de información.

## 2. ¿CUÁLES SON LAS CARACTERÍSTICAS DE LA ENTIDAD INTERESADA?

Las medidas que acabamos de presentar conciernen a empresas y a administraciones e institutos de investigación, así como a establecimientos de enseñanza o de información. Estas diferentes entidades tienen también vocaciones diferentes. Sus preocupaciones y enfoques con respecto a la protección ambiental no se plantean ni de la misma forma ni en las mismas condiciones. La solución del problema a resolver depende, pues, del análisis de la situación que ocupe el medio ambiente en los objetivos de la entidad para la que se adopte la medida o a la que se le plantee un determinado problema.

Estos aspectos influyen en las necesidades de información, es decir, en la naturaleza de la información útil para el caso considerado, así como en las condiciones de la recogida y explotación de datos (estas condiciones se exponen en el capítulo II).

A fin de orientar al ingeniero en la determinación de la información necesaria para su caso concreto, a continuación se exponen en forma resumida las principales preocupaciones, con respecto a la protección del medio ambiente, de cada uno de esos tipos de entidades (figura 3).

### 2.1 ADMINISTRACIONES

Su función es asegurar una protección o servicio a los ciudadanos y empresas de un determinado país. En interés común, la Administración pública se encarga de la vigilancia y de la protección del medio ambiente, así como de la calidad de vida de la

población.

Los criterios de selección de la información deseada están relacionados con el servicio que haya que asegurar y con los espacios administrados (internacional, nacional, regional, local, etc.).

Los servicios que haya que asegurar, aludidos en el párrafo anterior, son parte de los objetivos principales de la Administración. Se trata, más concretamente, de: legislaciones, reglamentaciones, controles, mediciones, ordenación del espacio, gestión de recursos naturales, protección de la salud de la población, etc.

Las necesidades de información para esas diferentes actividades son asimismo prioritarias. En particular, los presupuestos asignados serán, por lo común, más elevados que en el caso de una empresa.

Los espacios administrados varían entre la escala local y la escala internacional. De ello se sigue que los presupuestos, la información a recoger y los medios de su difusión, varían según la misma escala, como puede verse por los dos ejemplos siguientes.

**Ejemplo N° 1:** Un ministerio de medio ambiente desea instalar equipo de control de emisiones de  $SO_2$  y  $NO_x$  procedentes de centrales térmicas del país, a fin de verificar si los procesos utilizados cumplen con las nuevas normas impuestas por la ley. Para ello, necesita conocer toda una serie de procedimientos de control de emisiones y de procedimientos de desulfuración y desnitrificación de emisiones. La información necesaria se refiere tanto a las características de los procedimientos como a su costo y a las características de aplicación y mantenimiento.

**Ejemplo N° 2:** Un organismo público debe autorizar rápidamente la construcción de una fábrica para el reciclaje de papel. Dicho organismo necesita información sobre los procesos de reciclaje del papel, así como sobre los efectos ambientales de tales plantas.

## 2.2 EMPRESAS INDUSTRIALES (productores de bienes de consumo y prestadores de servicios)

Las empresas, los diseñadores, y las oficinas de investigación y desarrollo, son, todos ellos, actores del desarrollo industrial; su objetivo es producir y vender bienes o servicios y obtener con ello un beneficio. Los costos, los tiempos de trabajo, la optimización económica a corto, mediano o largo plazo, son factores esenciales de la producción y de la rentabilidad. Estos factores condicionan directamente la información a localizar. Así, pues, la protección del medio ambiente influye en los precios de los productos vendidos y afecta, por tanto, al mercado. Fabricar un producto limpio tiene una consecuencia directa en su distribución. Es preciso llegar a una transacción entre el precio del mercado y el precio de fábrica del producto limpio, tanto en lo tocante a su fabricación como a su utilización. Para llegar a esa transacción, es esencial disponer de información específica.

Los problemas ambientales a resolver se relacionan con las principales actividades de las empresas y conocimiento del mercado nacional o internacional:

- innovación y concepción de un producto;
- utilización de materias primas;
- respeto de la reglamentación internacional;
- proceso de fabricación de un determinado producto;
- control cualitativo y cuantitativo de los productos y de los procesos;
- recursos humanos;
- mantenimiento y desarrollo de aptitudes profesionales;
- evaluación de resultados;
- elaboración de la estrategia; y
- venta de productos y servicios.

En cada una de esas actividades pueden plantearse cuestiones relacionadas con la protección del medio ambiente:

- ¿Cuáles son las reglamentaciones en las zonas de implantación de las fábricas y dentro de éstas? ¿Cómo pueden hacerse cumplir?
- ¿Cómo puede diseñarse un producto limpio que sea competitivo en los mercados previstos?

- ¿Cómo pueden prevenirse los riesgos de contaminación derivados de la fabricación y, posteriormente, de la distribución y utilización de un producto?
- ¿Cómo medir, controlar y reducir los residuos y las emisiones de una instalación industrial?
- ¿Cuáles son los costos y los beneficios que cabe esperar de la introducción de procesos no contaminantes o de la instalación de circuitos de descontaminación o de reutilización?
- ¿Cuáles son los efectos económicos de una evaluación de riesgos para una mejor prevención de accidentes industriales?

La información necesaria para responder a estas cuestiones es específica de cada caso. En todos los casos, es compleja y entraña la consideración de los objetivos esenciales de la empresa interesada, como puede verse en los ejemplos siguientes:

**Ejemplo Nº. 1:** Una empresa dedicada a la destrucción de residuos tóxicos ha desarrollado un nuevo proceso (limpio) de destrucción de PCB en los aceites usados. Esa empresa ha adquirido la patente mundial exclusiva de dicho proceso. Desea entonces aumentar el mercado específico para ese producto e instalar una red de ventas. Busca información sobre:

- la magnitud de los problemas ambientales relacionados con los PCB en ciertos países del mundo en que desearía establecerse;
- las legislaciones relativas a los procesos químicos cuando se sumergen en el mar aceites contaminados por los PCB;
- la clasificación internacional de aceites que contienen PCB;
- su toxicidad relativa, el derecho de transporte internacional y de almacenamiento;
- los datos por países relativos a las cantidades de aceites contaminados, etc.

**Ejemplo N.º 2:** Un productor de acero desea proteger la salud de los trabajadores empleados en su fábrica. A tal fin, prevé la instalación de un servicio de medición y control de la contaminación ocasionada por el polvo y el gas arrojados a la atmósfera dentro y fuera del establecimiento y en el sistema acuático próximo. Busca entonces información sobre los procedimientos de control de la contaminación del aire y del agua y sobre los programas de capacitación de personal que le permitan establecer el servicio previsto.

**Ejemplo N.º 3:** Una empresa industrial, habiendo decidido aprovechar los residuos de la industria del pino para producir tinturas, busca información sobre las tecnologías apropiadas, sabiendo que el derivado polifelónico producido en grandes cantidades por esta actividad, y utilizable como tintura, puede también, combinado, polimerizado y endurecido con otras sustancias, utilizarse como aglutinante y cola en la fabricación de madera aglomerada.

### 2.3 OFICINAS DE DISEÑOS

Punto de partida del desarrollo industrial, las oficinas de diseños conciben, estudian, preparan y encargan la realización de infraestructuras, las instalaciones industriales, la construcción de edificios, la fabricación de productos, etc.

La preocupación por la protección del medio ambiente está presente en cada uno de esos proyectos, y se manifiesta en forma diferente en cada uno de ellos. Las preocupaciones de las oficinas de diseños corren parejas con las de las empresas, con la diferencia de que las primeras han de tener más en cuenta el futuro y se enfrentan constantemente con casos especiales, diferentes unos de otros.

Estas entidades se enfrentan con problemas de medio ambiente relativos, por ejemplo, a lo siguiente:

- Desarrollo y difusión de nuevos procesos "limpios", de nuevas tecnológicas o de nuevos productos;
- Efectos de las infraestructuras, equipamientos e instalaciones en el medio ambiente natural (ciertos proyectos de desarrollo adolecen de limitaciones de los estudios de los efectos en el medio ambiente y en la población);
- La preparación de expedientes sobre la situación actual y el sistema de previsión para detectar los posibles efectos de todas las formas de desarrollo.

Los criterios de elección de la información deseada son los mismos que los adoptados por los institutos y centros de investigación, pero:

- La toma en cuenta de los costos y de los plazos reviste mayor importancia en las oficinas de diseños, donde puede llegar a ser un criterio de elección fundamental;
- Los indicadores deben seleccionarse con sumo cuidado a la luz del objetivo del estudio emprendido, con miras a una rentabilidad rápida y máxima.

### 2.4 INSTITUTOS DE INVESTIGACIÓN CIENTÍFICA BÁSICA O APLICADA

Su objetivo es adquirir conocimientos, o bien transferirlos de un sector a otro o de una aplicación a otra, y la información constituye la base de su actividad; a ella se le dedican recursos financieros y tiempo considerables.

La información que estas entidades pueden necesitar se refiere, por ejemplo, a lo siguiente:

- La obtención, el estudio a fondo, el desarrollo y la gestión de conocimientos sobre las relaciones existentes entre los elementos del medio ambiente natural y los diferentes aspectos de la actividad humana;
- La investigación básica en física, química, biología, etc., aplicada a las relaciones entre los productos, materiales (metales pesados, productos químicos, etc.) y los tejidos de los organismos (vegetales, animales) que viven en el aire, en la tierra o en el agua, en el contexto de la cadena alimentaria;
- Los trabajos sobre las interacciones y las modalidades de las transferencias de poluentes

y de contaminantes entre los medios, etc.

Los criterios de elección de la información buscada son los siguientes:

- La fiabilidad y la validez (la fecha más reciente posible) de los datos recogidos;
- La focalización de la recogida de datos en el objetivo previsto sin dispersarse por otros campos u objetivos (elección delicada cuando se trata del medio ambiente y de la investigación); El acopio de una información útil y explotable lo más exhaustiva posible;
- El establecimiento de contactos (lo más frecuentemente personales) capaces de imprimir un dinamismo productivo y continuo a la investigación emprendida.

**Ejemplo Nº 1:** Un instituto de investigación de un país determinado tiene la obligación contractual de proporcionar datos cuantitativos sobre los flujos y procesos de contaminación de las reservas de agua potable originada por los residuos de una mina de estaño. Por tanto, el instituto trata de obtener, posiblemente en otro país, todo estudio que se haya realizado sobre el tema de los efectos producidos en el medio ambiente por los residuos de minas de estaño.

**Ejemplo Nº 2:** Otro instituto de investigaciones especializado en los estudios relativos a las industrias de la celulosa (que lo financian) busca información relativa a las tecnologías que permitan resolver un determinado problema de contaminación planteado por una fábrica de alcohol. El objetivo es reducir residuos contaminantes específicos.

## 2.5 SERVICIOS DE INFORMACIÓN Y DE TRANSMISIÓN DE CONOCIMIENTOS

### *Servicios de documentación*

Estos servicios tienen por finalidad constituir un fondo documental, gestionarlo, mejorar su funcionamiento, ampliar los campos de interés, comunicarse con los solicitantes de información con

un objetivo preciso, etc.

### *Establecimientos encargados de informar o enseñar*

Para su labor de transmisión de conocimientos requieren una buena disponibilidad de información actualizada, fácil de manejar, accesible y fácilmente sintetizable.

### *Organizadores de congresos, reuniones y exposiciones*

Ya se trate de municipalidades, administraciones nacionales o internacionales, museos, etc., la celebración de una reunión o una exposición temática dependerá del acopio y de la elección previas de información completa y actualizada.

La elección de información dependerá de esas condiciones específicas. Así, pues:

- Los contactos con el exterior para obtener la información deseada son determinantes. La verificación de las fuentes de información que puedan proporcionar datos útiles es un requisito previo a la iniciación de la labor;
- Los expedientes temáticos deben constituirse y gestionarse a partir de ficheros de entradas múltiples en que las áreas y temas se registren y organicen de forma que pueda encontrarse rápidamente la información necesaria;

Para ello, la definición de la información, las modalidades de suministro a los usuarios, los procesos y los medios de trabajo, los costos, etc., (es decir, los temas que son aquí objeto del método propuesto para el análisis de las necesidades de información), revisten particular importancia, ya se trate de crear medios de información o de fijar prioridades para adquirirla.

## 2.6 ASOCIACIONES SIN FINES DE LUCRO Y AGRUPACIONES PROFESIONALES

Estas asociaciones desarrollan actividades, en el campo de la información, cuyas condiciones y modalidades se ajustan a las de las entidades antes citadas. El precio a pagar está en función del presupuesto y de los objetivos de la asociación que busca información.

La elección de la información a difundir depende de la política de la asociación, de las preocupaciones de sus miembros, de su deseo de

promover los contactos entre miembros y, por último, de su funcionamiento.

### 3. ¿CUÁL ES LA SITUACIÓN DEL PAÍS?

Las necesidades de información sobre el medio ambiente se dejan sentir en todos los países y en todas las entidades más o menos directamente relacionadas con las actividades industriales. En lo tocante al medio ambiente, las actividades de una entidad, cualquiera que ésta sea, no puede disociarse de su contexto socioeconómico general (figura 4), pues la naturaleza de las necesidades y de los medios de información, así como el objetivo de esas actividades, varían tanto como las condiciones en que surgen esas necesidades.

Las necesidades de información sobre el medio ambiente variarán según la etapa industrial en que se halle el país, el lugar que ocupe el desarrollo industrial en el conjunto de su política de desarrollo, y las opciones relativas al medio ambiente que se inscriban en el marco de esa política. También variarán los medios utilizados para obtener información útil.

En efecto, la situación y el grado de progreso del desarrollo industrial, influyen directamente en la experiencia industrial (por ejemplo, procesos y tecnologías limpios), como lo hacen también las reglamentaciones ambientales que las entidades interesadas deben cumplir. Esos factores también influyen en la existencia de relaciones privilegiadas con, por una parte, las agrupaciones industriales del país y del extranjero (titularidad de patentes, transferencia de tecnología, cursos de capacitación, etc.) y, por otra, con diversas fuentes de información.

Cuanto más industrializado esté un país, mayores serán sus posibilidades de acceso (en cuanto a tiempo y costos) a la información sobre el medio ambiente, y más fácil resultará obtenerla.

Los problemas (comprendidos los de orden financiero) y las preocupaciones (comprendidas

las prioridades y los criterios de elección) relativos al medio ambiente, a las tecnologías y a las innovaciones, a la medición, control, prevención y reducción de la contaminación, a la urbanización y al crecimiento específico de la industria del medio ambiente, etc., varían según la fase de desarrollo industrial del país de que se trate. La naturaleza, y sobre todo las fuentes y los orígenes de la información útil, diferirán en función de estas características.

La información útil dependerá de:

- La naturaleza y la importancia de los sectores industriales;
- Los objetivos de desarrollo y el grado de integración del medio ambiente en la planificación económica y territorial; y de
- Las prioridades de actuación, en función de las prioridades de desarrollo y de elección (cualesquiera que sean las bases) entre los objetivos a corto y a largo plazo (propiciando estos últimos que el medio ambiente sea tenido en cuenta a la hora de adoptar decisiones).

Las características de la información útil se determinan con arreglo a esos objetivos, elecciones y prioridades, al igual que las modalidades de recogida y difusión de esa información. Esos criterios constituyen, pues, un elemento importante al analizar y definir necesidades y al elegir proveedores de información. Por ejemplo:

- Una entidad ubicada en un país industrializado tendrá necesidad, la mayoría de las veces, de información sobre mercados, patentes, legislación y reglamentaciones, etc.;
- Una entidad ubicada en un país en desarrollo tendrá necesidad, las más de las veces, de información sobre los procedimientos (de fabricación, de reducción o prevención de la contaminación, de control y medición de residuos), su costo, las normas ambientales existentes en otros países, y los efectos de una fábrica proyectada.



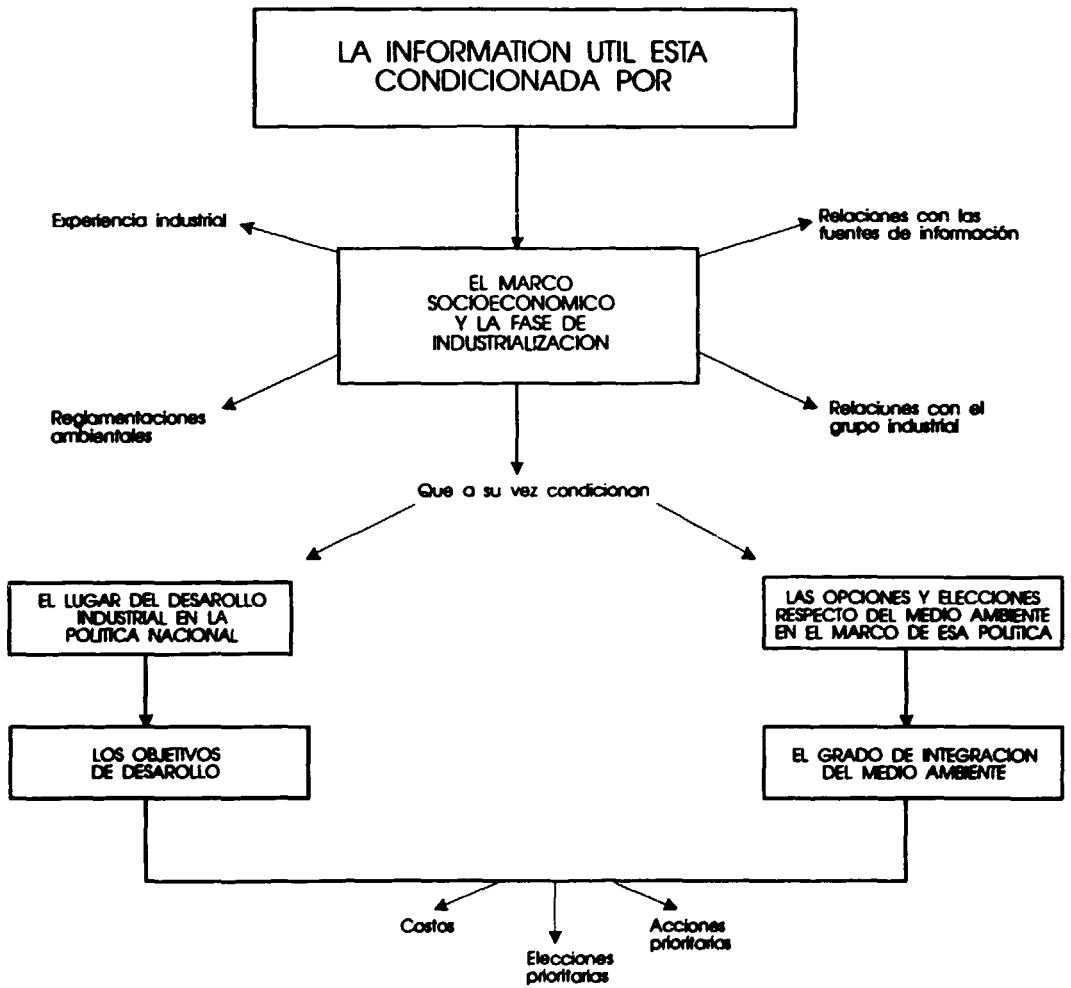


Figura 4 Estado de industrialización y requerimientos de información del medio ambiente

**“Es imposible transmitir sistemáticamente información de un país a otro, o aplicar un análisis de las necesidades nacionales de información a un contexto extranjero, aun cuando se trate de una misma categoría de ingenieros empleados en el mismo tipo de entidad. La naturaleza, las fuentes, y los orígenes de la información útil, varían en función del nivel de desarrollo de los países, al igual que las modalidades de recogida y difusión de información\*.”**

\* “Approche méthodologique pour identifier les besoins en information des ingénieurs” (versión provisoire). UNISIST, UNESCO, 1984, pág. 11.

# CAPÍTULO 2

## CÓMO PROCEDER

### PRINCIPIO DEL PROCEDIMIENTO

En el capítulo anterior, hemos señalado:

- La variedad de actuaciones y situaciones con las que un ingeniero puede verse enfrentado para proteger el medio ambiente;
- El proceso para diagnosticar cada caso, utilizando esquemas normalizados; tal diagnóstico precede necesariamente a la búsqueda de información y la condiciona;
- Las consecuencias de la importancia de la actuación prevista por la entidad de que se trate, y de la situación nacional, para las condiciones de la búsqueda de información (figura 5).

### SABER QUE ES LO QUE SE QUIERE

Analizar la actuación prevista o el problema a resolver. Este análisis se explica en el capítulo I, y permite determinar:

- El objetivo que se persigue con la información que hay que buscar;
- El contexto en el que esa información será utilizada;
- Las condiciones para adquirir información: plazo de obtención, costo posible, volumen de información a reunir y grado de precisión necesario. Estas condiciones sirven de orientación al elegir los medios de información que permitan la mejor relación calidad-precio para la tarea de que se trate;
- Las prioridades en la búsqueda de esa información.

### DETERMINAR LAS CARACTERÍSTICAS DE LA INFORMACIÓN QUE HAYA QUE BUSCAR IDENTIFICAR LAS FUENTES DE INFORMACIÓN

El conocimiento preciso del objetivo para el que se requiere la información, y del contexto en que

ésta será utilizada, permite (figura 6):

- Determinar el tema de la información, su contenido, su alcance, es decir, el campo de interés al que se refiera, y el objetivo de la información que haya que buscar;
- Especificar la naturaleza de la información: científica, técnica, económica, jurídica o geográfica;
- Limitar su antecendencia: determinar la fecha hasta la que será útil remontarse en la búsqueda de la información;
- Elegir la fuente de información: dentro de la entidad de que se trate, en el país o en el extranjero.

La información útil para el objetivo en cuestión, así definida, se encuentra en documentos (en el más amplio sentido del término) o en fuentes de información, de diversas clases y específicamente indicadas para el caso considerado.

El análisis de la actuación prevista y la identificación de información útil permite:

- Seleccionar, entre las fuentes de información posibles, aquellas en que haya mayor probabilidad de encontrar la información deseada;
- Distinguir en cada caso tres categorías de documentos (o fuentes): los documentos propios de la entidad, los documentos procedentes de su país, y los documentos procedentes del extranjero.

### ELEGIR LOS MEDIOS PARA OBTENER LA INFORMACIÓN BUSCADA

La definición de las características de la información que haya que buscar, la selección de apoyos preferenciales a utilizar para encontrar esa información, y la determinación de las condiciones para obtenerla, permiten:

- Seleccionar, entre las entidades que proporcionen información a terceros, aquellas que puedan facilitar lo que interese (información y documentos) en las condiciones deseadas;

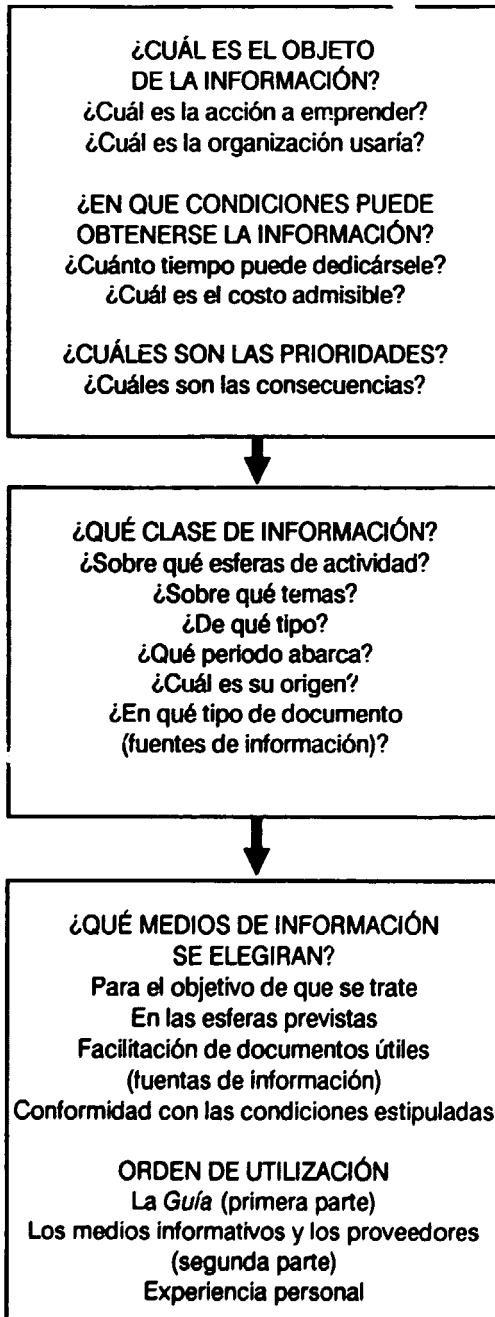


Figura 5 Principios que rigen el procedimiento de busca de información

Información... pero no cualquier clase de información

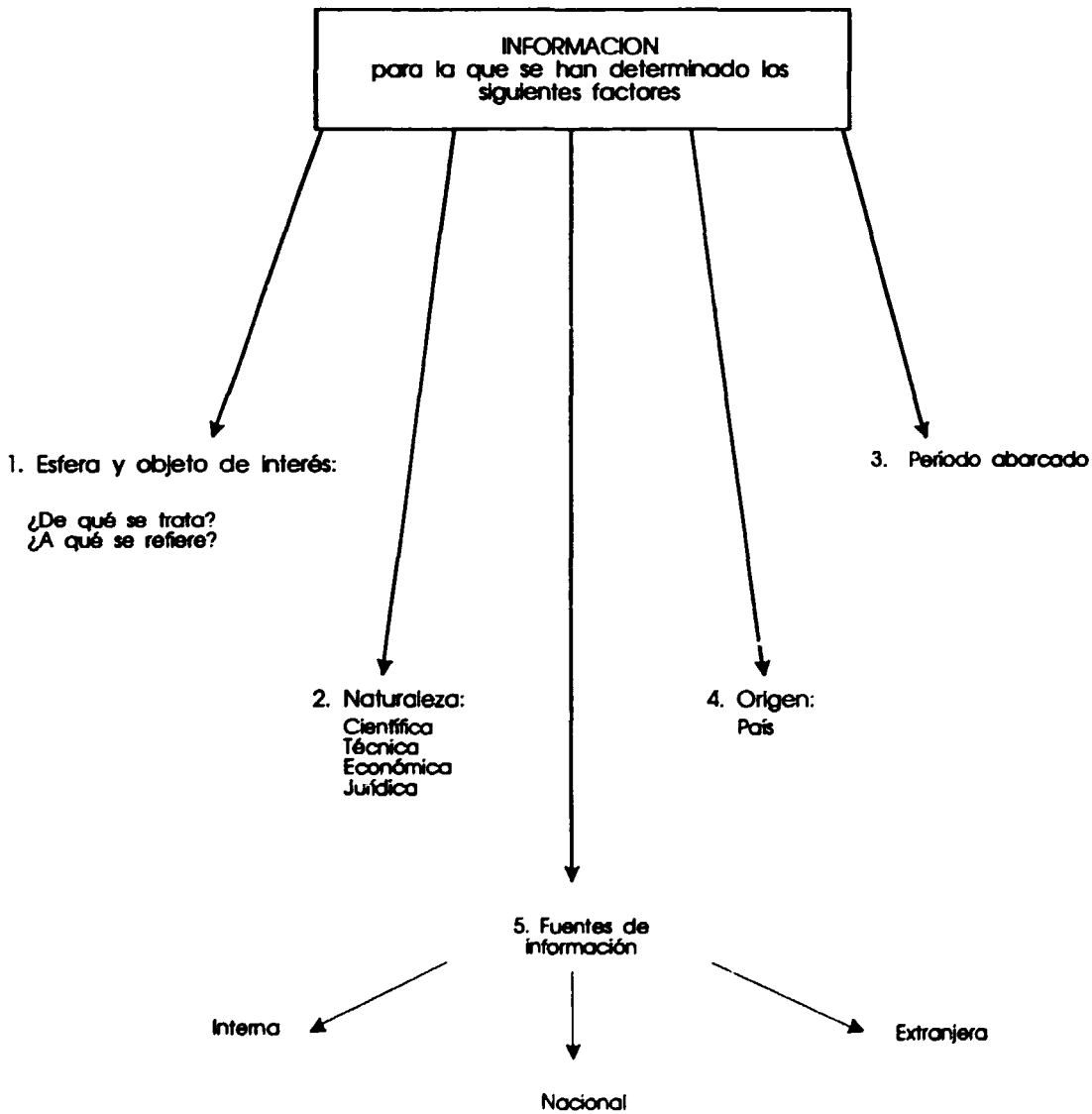


Figura 6 Características de una información útil

- Elegir, para consultar a esas organizaciones, las modalidades apropiadas a las condiciones fijadas (medios informáticos, transmisiones electrónicas, vías postal y oral, etc.).

Se trata del mismo método que el seguido para encontrar un producto, un material, un procedimiento o un equipo. Por esta razón, denominaremos "proveedores de información" a las entidades que proporcionen información a terceros (centros de información, bibliotecas,

centros de prensa, centros de documentación, servidores de bancos de datos, etc.).

Fundándonos en este principio, y siguiendo las indicaciones del capítulo I, explicaremos la forma de proceder. A fin de facilitar el procedimiento de búsqueda de la información, de asegurar el rigor necesario y de actuar rápidamente, proponemos, para cada etapa, las posibilidades entre las cuales elegir.

### ¿Qué se entiende aquí por “medio de información”?

Una entidad que recoge y explota fuentes de información con miras a facilitar ésta a terceros.

Esa información se proporciona bien sea directamente, en respuesta a peticiones específicas, bien mediante boletines periódicos, bancos de datos, bibliografías, síntesis, etc.

Por las razones indicadas en el principio de procedimiento de búsqueda de información, y a fin de simplificar, denominaremos a esas entidades proveedores de información.

La selección dependerá de las características propias de la entidad:

- El objetivo: ¿a qué clientela atiende la entidad? ¿Cuál es su “misión”?
- el campo de interés de la información recogida;
- la índole de las fuentes de la información reunida: especialistas, objetos, documentos escritos, películas, etc., o la índole de la información propiamente dicha;
- la fase de procesamiento de las fuentes de la información reunida;
- su credibilidad: condiciones y calidad de la recogida de datos y del procesamiento de la información proporcionada;
- el origen (geográfico) de las fuentes o de la información recogidas;
- el modo de atender la entidad consultas sobre sí misma o sobre los productos que proporciona vía oral (teléfono, visitas, etc.), vía postal; medios informáticos (consulta de bancos de datos, servicios de mensajería electrónica, etc.); transmisiones electrónicas diversas: por ejemplo, por télex, teleconferencia o telefax.

La elección final dependerá del posible costo de la información obtenible en los plazos deseados y del trabajo complementario que requiera la información recibida según la forma en que se facilite, así como de la conveniencia para quienes consulten esa información.

En el anexo 2, se indican las clases de proveedores de información, diferenciadas según el grado de procesamiento de la documentación.

En la segunda parte de esta *Guía*, proponemos una lista de entidades que facilitan datos especialmente relacionados con la protección del medio ambiente. En la medida en que ha sido posible conocer esas entidades, se indican asimismo sus características específicas.

**Nota** Conviene señalar que una necesidad de información, dada su complejidad, rara vez es totalmente satisfecha por un solo proveedor de información, y ello porque:

- Si es ajeno a la entidad del usuario, no dispone de información interna de esa entidad;
- Muchos solicitantes no recurren a fuentes vivas, pese a que estas últimas son, en muchos casos, las fuentes esenciales de la información deseada;
- Como los casos son complejos y específicos, no es seguro que puedan ser atendidos por un solo proveedor.

Por tanto, en la mayoría de los casos, conviene dirigirse a varios proveedores, procediendo por diferentes vías.

De la elección de esos proveedores dependerá la fiabilidad de la información recibida, el ahorro de tiempo en su utilización, y el que se respeten los límites presupuestarios.

La elección será tanto más eficaz si:

- Se sabe lo que se quiere y en qué condiciones (véanse las fases 1 y 2 del método propuesto);
- Se dispone de una amplia serie de proveedores de información en numerosos países, así como en las organizaciones internacionales (véase la parte II del presente *Guía*);
- Se efectúan las selecciones de modo que se asegure la fiabilidad óptima de la información recibida para la tarea de que se trate, en las condiciones que se hayan fijado.

## **FASE 1: ESPECIFICAR LO QUE SE NECESITA: ¿PARA QUÉ SE QUIERE LA INFORMACIÓN? ¿EN QUÉ CONDICIONES?**

Véase el capítulo I.

- Elegir, entre los casos típicos de actuaciones y entidades, los aplicables al caso concreto para el que se desea información;
- Tener en cuenta las condiciones específicas del país al que afecte el caso en cuestión, consultando para ello la sección 3 del capítulo I;
- Analizar el caso en cuestión mediante el siguiente diagrama:

### **1. ¿CUÁL ES LA ACTUACIÓN PREVISTA?**

#### **1.1 ¿EN QUÉ FASE SE BUSCA LA INFORMACIÓN?**

*Observaciones*

- Decisión
- Exploración
- Innovación
- Concepción
- Realización
- Difusión

#### **1.2 ¿QUÉ TIPO DE ACTUACIÓN DEBE EMPRENDERSE?**

*Observaciones*

- Reglamentar las actividades y sus efectos
- Promulgar disposiciones legislativas relativas al medio ambiente
- Establecer normas
- Efectuar mediciones y controles
- Establecer datos numéricos
- Prevenir los problemas relacionados con el medio ambiente
- Asegurar la optimización económica de la actividad industrial
- Reducir la contaminación

- Respetar la reglamentación
- Desarrollar nuevos mercados
- Transmitir conocimientos
- Enseñar
- Informar
- Otras actividades (específicase)

### **2. ¿DE QUÉ ENTIDAD SE TRATA?**

*Observaciones*

- Administración (ministerio, instituto, ayuntamiento, etc.)
- Empresa industrial
- Oficina de investigación y desarrollo
- Instituto de investigación básica y aplicada
- Establecimiento de capacitación
- Organismo de información
- Asociación sin fines de lucro
- Otras entidades (específicase)

### **3. ¿CUÁLES SON LAS CONDICIONES ESPECÍFICAS DEL PAÍS INTERESADO?**

### **4. ¿CUÁLES SON LAS CONSECUENCIAS DE LA ACTUACIÓN PREVISTA?**

#### **4.1 PARA LA ENTIDAD INTERESADA**

*Explicar*

- Para la política general
- Para conservar sus mercados
- Para crear nuevos mercados
- Otras consecuencias (específicase)

#### **4.2 EN EL PAÍS INTERESADO**

- Para el conjunto de la actividad industrial
- En la opinión pública
- En un grupo de personas
- En otros aspectos (específicase)

#### **4.3 PARA EL INGENIERO O EQUIPO ENCARGADO**



## 5. ¿CUÁLES SON LAS CONDICIONES PARA OBTENER INFORMACIÓN?

Según las respuestas a las cuatro preguntas anteriores, evalúense las siguientes condiciones:

- ¿Cuándo será utilizada la información?
  - ¿Cuál es el plazo para disponer de ella?
  - ¿Cuál es el costo máximo posible de la búsqueda de información?
  - En consecuencia, ¿cuál es el tiempo máximo posible que habrá de dedicársele?
- ¿Menos de una hora?
  - ¿Menos de un día?
  - ¿Menos de una semana?
  - ¿Más? (especifíquese la duración)
- Qué precisión se requiere de la información deseada?

**Nota** Si el ingeniero busca la información para otra empresa: ¿A quién está destinada la información?

- Observaciones*
- La persona responsable de la actuación

### Ejemplo:

#### finalidad de la información

En la India, el Ministerio de Medio Ambiente desea reducir las emisiones de SO<sub>2</sub> y de NO<sub>x</sub> procedentes de las centrales térmicas.

#### Fase 1

1) ¿Cuál es la situación actual? Realización

¿De qué se trata? Ordenación del medio ambiente; medición y control; reducción de la contaminación; adquisición de material para reducir y controlar las emisiones.

2) ¿Cuál es la entidad interesada? Administración.

3) ¿Cuáles son las condiciones específicas del país?

País en desarrollo que posee industria propia pero que desea utilizar tecnologías procedentes del extranjero.

4) ¿Cuáles son las consecuencias?

a) En la organización

- Establecimiento de un servicio de aplicación y control de procedimientos o procesos;
- Estudio de mercado sobre los procedimientos menos costosos.

El director o la junta directiva de la entidad

Un servicio especializado (investigación, documentación)

Un especialista del medio ambiente

Una persona que no es especialista del medio ambiente

• ¿Qué sabe esa persona sobre el medio ambiente?

• ¿Cuáles son los idiomas de trabajo posibles?

• ¿En qué formas deberá proporcionarse la información?

Documentos fuente

Lista de direcciones o de referencias

"Dossier"

Síntesis, informe

## 6. ¿CUÁLES SON LAS PRIORIDADES?

La satisfacción de la necesidad de información se ve necesariamente limitada por el costo y el tiempo posibles que haya que dedicar para obtener la

b) En el país de que se trate

- Costo excesivo del equipo;
- Efectos positivos en la población y en el medio ambiente (a los niveles nacional e internacional).

5) ¿Cuáles son las condiciones?

- Plazo para la disponibilidad de datos explotables: cuatro meses.

- Costo máximo de la búsqueda de información: a definir (función de la decisión de aplicación).

- Máximo de tiempo disponible para la búsqueda de la información: tres meses.

- "Dossier" destinado a: la junta directiva.

- Idioma de trabajo: inglés.

- ¿Qué forma? "Dossier" sobre procedimientos (características, origen, costo de compra, costo de aplicación, costo de mantenimiento).

6) ¿Prioridades?

- Catálogo de procedimientos clasificados por costos y calidad con el fin de reducir las emisiones gaseosas.

**Nota:** La fase 2 del proceso se detalla en la siguiente sección.

información. Es necesario llegar a una transacción entre:

- La obtención de todos los datos que permitan satisfacer la necesidad de información; y
- La obtención de toda información que sea posible conseguir en las condiciones fijadas.

A tal fin, deberán determinarse prioridades, con objeto de orientar la elección de información a recoger y, posteriormente, la elección de los medios de información.

Explíquese, en unas líneas, que es lo que tiene prioridad en la acción a emprender o en el problema a resolver.

## FASE 2a: INDICAR CON PRECISIÓN LA INFORMACIÓN A LOCALIZAR

Consultar el conjunto de respuestas a las pregun-

### Ejemplo:

Características de la información que haya que buscar, fase 2 (continuación)

En la India, el Ministerio de Medio Ambiente desea reducir las emisiones de SO<sub>2</sub> y de NO<sub>x</sub> procedentes de centrales térmicas.

El citado ministerio desea conocer:

#### a. *El campo en cuestión:*

emisiones gaseosas

#### b. *Los temas*

- Tema 1:
  - (b.1) = procedimientos (procesos) de desulfuración y de denitrificación de emisiones;
  - (b.2) = costos;
  - (b.3) = características operacionales y de mantenimiento;
  - (b.4) = consecuencias en términos de espacio (emplazamiento).
- Tema 2:
  - (b.5) = sistema de tratamiento y utilización de residuos.

#### c. *La índole de la información:*

para b.1 y b.5: técnica

para b.2, b.3 y b.4: económica

#### d. *La antigüedad de la información:*

para b.1 y b.5: menos de 5 años

tas formuladas en la fase 1, utilizando éstas como guía, indicar con precisión la información a localizar con ayuda de la figura 6 y del esquema siguiente.

Reagrupar los resultados en el cuadro 2.

## 7. ¿CUÁLES SON LOS TEMAS DE LA INFORMACION?

Los temas de la información, es decir, su contenido, están determinados por el campo al que la información se aplica, en un campo determinado, por el objeto, por aquello de que se trata, formulado por las preguntas:

- ¿Qué?
- ¿Qué campo?
- ¿Acerca de qué?
- ¿Con qué finalidad?

para b.2 y b.3: menos de 1 año

para b.4: más de 5 años

#### c. *El origen:*

Información interna

e.1: servicios internos del ministerio, encargados de la vigilancia de la contaminación, encargados del sector energético (para b.1 a b.4) encargados de la gestión de residuos (para b.5).

Información externa

e.2: El Ministerio Indio de Industria (servicios encargados de la explotación de instalaciones energéticas) (para b.1 a b.5);

e.3: Cámaras Indias de Comercio (para b.1, b.2 y b.5);

e.4: Industriales Indios y Asociaciones Profesionales Regionales y Nacionales (para b.1, b.4 y b.5).

Información extranjera

e.5: Embajadas extranjeras (agregados económicos) (para b.1 y b.5).

e.6: Asociaciones profesionales internacionales y organizaciones internacionales (para b.1, b.2 y b.5);

e.7: Fabricantes (para b.1 a b.5).

Es preciso optar entre los orígenes a sondear, según la importancia de la acción emprendida, del tema y de la naturaleza de la información deseada

### 7.1 ¿DE QUÉ TRATA LA INFORMACIÓN?

En el capítulo 1 se indicó que, para satisfacer una necesidad de información, era preciso reunir datos sobre varios campos (diferentes para cada caso). Se trata en general de campos relacionados con el medio ambiente y de campos independientes de éste.

La figura 7 muestra un conjunto de grandes grupos de interés que pueden tenerse en cuenta en la búsqueda de información para la protección del medio ambiente.

Utilizando este plano, y a base de las respuestas a las preguntas formuladas en el fase 1, especifíquense a continuación los campos o esferas de interés, y consígnense en el cuadro 1.

Información sobre:

- Los residuos sólidos domésticos e/o industriales
- Las aguas usadas domésticas e/o industriales
- Las emisiones gaseosas
- Los residuos y productos tóxicos
- Metales pesados
- Productos químicos (detergentes), (plaguicidas), (fertilizantes),

*Observaciones*

(otros productos químicos: especifíquense)

- Radioactividad
- Ruido
- Salud
- Implantación de una zona industrial
- Planificación urbana
- Otras cuestiones (especifíquense)

### 7.2 ¿A QUÉ SE REFIERE LA INFORMACIÓN?

La figura 8 muestra un conjunto de objetivos relacionados con la protección del medio ambiente.

A base de este diagrama, determinar el objetivo de cada una de las áreas de información a localizar y consignarlo en el cuadro 1.

### 7.3 ¿CUÁL ES EL ORDEN DE PRIORIDAD DE LA INFORMACIÓN A LOCALIZAR?

De acuerdo con las prioridades de la acción a emprender, como las definidas en la fase precedente (punto 6), indíquese en el cuadro 1 el orden de prioridad de la información a obtener.

### 7.4 ¿CUÁL ES LA NATURALEZA DE LA INFORMACIÓN SELECCIONADA?

Especifíquese, en el cuadro 1, la naturaleza de cada información: científica, técnica, económica,

**Ejemplo** siguiendo con el ejemplo anterior de una solicitud de información sobre los costos de instalación y de mantenimiento de procesos de desulfuración y de nitrificación de emisiones gaseosas, en comparación con su eficacia (es decir, aceptabilidad a la luz de las normas establecidas), y sobre los sistemas para el tratamiento y el aprovechamiento de los residuos de esos procesos. La información necesaria puede que se obtenga de:

- Catálogos: fuente interna (si el catálogo existe en los servicios del ministerio solicitante), fuente externa (si el catálogo ha de obtenerse de otro organismo o entidad ubicados dentro del territorio nacional), o extranjera (si el catálogo ha de obtenerse de una organización extranjera). Esto no influye en la cobertura geográfica (nacional o internacional) del catálogo en cuestión.

Los catálogos pueden proporcionar la siguiente

información: lista de proveedores; tipos disponibles de equipo; costo, características técnicas y de mantenimiento (estos datos suelen obtenerse de los fabricantes), etc.;

- Publicaciones y periódicos (para su análisis técnico);
- Patentes (para saber quiénes poseen "know-how" y, posiblemente, los derechos de distribución);
- Informes y estudios (internos, externos y obtenibles de los proveedores) para saber cuáles son las consecuencias de los procesos en materia de espacio, eficacia de funcionamiento en el medio ambiente y para una situación específica;
- Fuentes vivas (ferias, organizaciones internacionales, y asociaciones profesionales, nacionales e internacionales), para conseguir asesoramiento de expertos, etc.

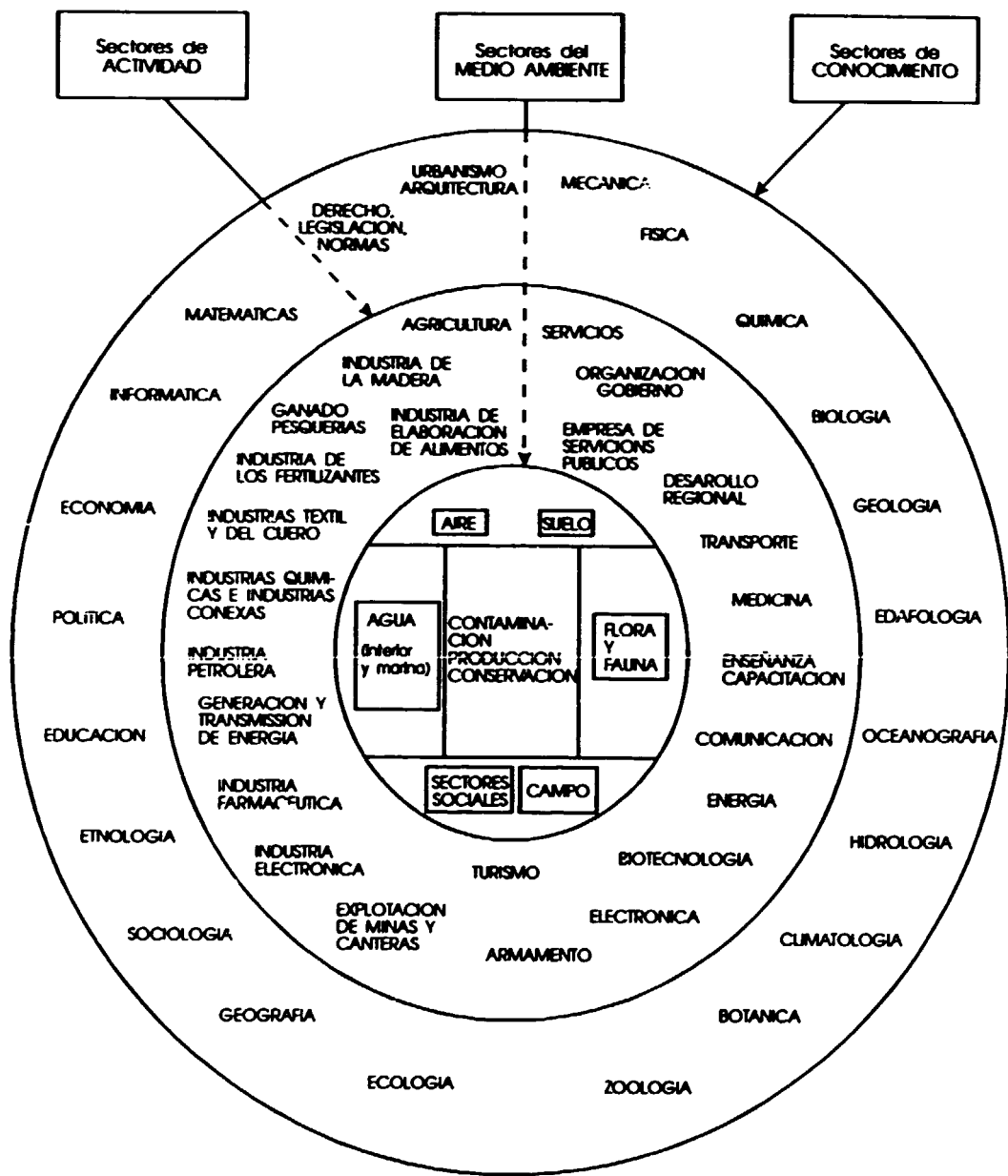


Figura 7 Esferas de interés para la protección del medio ambiente

jurídica, etc. Esta descripción sirve de guía para la elección de proveedores, que se diferencian a menudo por el tipo de información de que se ocupan.

## 8. ¿ANTIGÜEDAD DE LA INFORMACIÓN

Teniendo en cuenta el objetivo previsto, deberá especificarse la antigüedad de la información.

Si es necesario, especifíquese para cada tema.

*Tema de información*

- Información de menos de un año de antigüedad
- Información de menos de dos años de antigüedad.
- Información de menos de cinco años de antigüedad
- Información de más de cinco años de antigüedad (especifíquese):

## 9. ¿CUÁL ES EL ORIGEN DE LA INFORMACIÓN?

En el capítulo I hemos mostrado que la información a reunir tiene necesariamente varios orígenes, externos e internos, que varían en función de la tarea a realizar; estos orígenes deberán especificarse en cada caso.

Utilizando la fase 1 como base, especifíquese la información a obtener:

- *Proporcionada por la entidad que encarga la búsqueda de información*  
¿Qué información? (especifíquese);
- *Proporcionada por el país de la entidad de que se trate*  
¿Qué información? (especifíquese);
- *Proporcionada por países extranjeros*  
¿Qué países? (especifíquense)  
¿Qué información? (especifíquese).

Consígnense los resultados de 6, 7, 8 y 9 en el cuadro 2.

## FASE 2 b: IDENTIFICAR LAS FUENTES DE INFORMACIÓN

La expresión "fuentes de información" designa todos los tipos de apoyo que contiene la

información susceptible de ser comunicada: una persona que transmita conocimientos personales, un objeto, una imagen, un disco o una casete, una publicación o cualquier otro documento escrito o impreso.

En el anexo 1 del presente capítulo damos una explicación sucinta de los principales destinos de las diversas clases de documentos.

¿Cuáles son las fuentes con mayores probabilidades de contener la información deseada para el objetivo propuesto? Se trata, pues, de determinar los soportes que ofrezcan las mayores probabilidades, como se ha dicho, de encontrar la información deseada.

### ¿Por qué proceder a esta elección, antes de la búsqueda propiamente dicha?

Un mismo conocimiento puede transmitirse mediante muchos tipos de soportes (denominados aquí "fuentes"), cuyo número crece con el desarrollo de las tecnologías de la información, que colocan en el mercado discos, disquetes, cintas magnéticas, periódicos electrónicos, etc.

Las informaciones relativas a ese conocimiento varían de un soporte a otro, pues están destinadas a objetivos diferentes. Se trata, en consecuencia, de seleccionar las clases de documentos cuyo destino esté en relación con el de las informaciones que haya que buscar.

La elección de los soportes de información condiciona la obtención de informaciones viables para un determinado objetivo, evitando un derroche de tiempo en su búsqueda.

### Cómo proceder?

Véase el anexo 1 del capítulo 2

- Consígnese en el cuadro 3 los elementos que figuran en el cuadro 2;
- Para cada uno de los temas de información, y guiándose por los resultados de la fase 1, selecciónense los soportes de información indicados en el cuadro 3;
- Especifíquese el origen con ayuda del cuadro 2;
- Utilícese como guía el ejemplo siguiente.

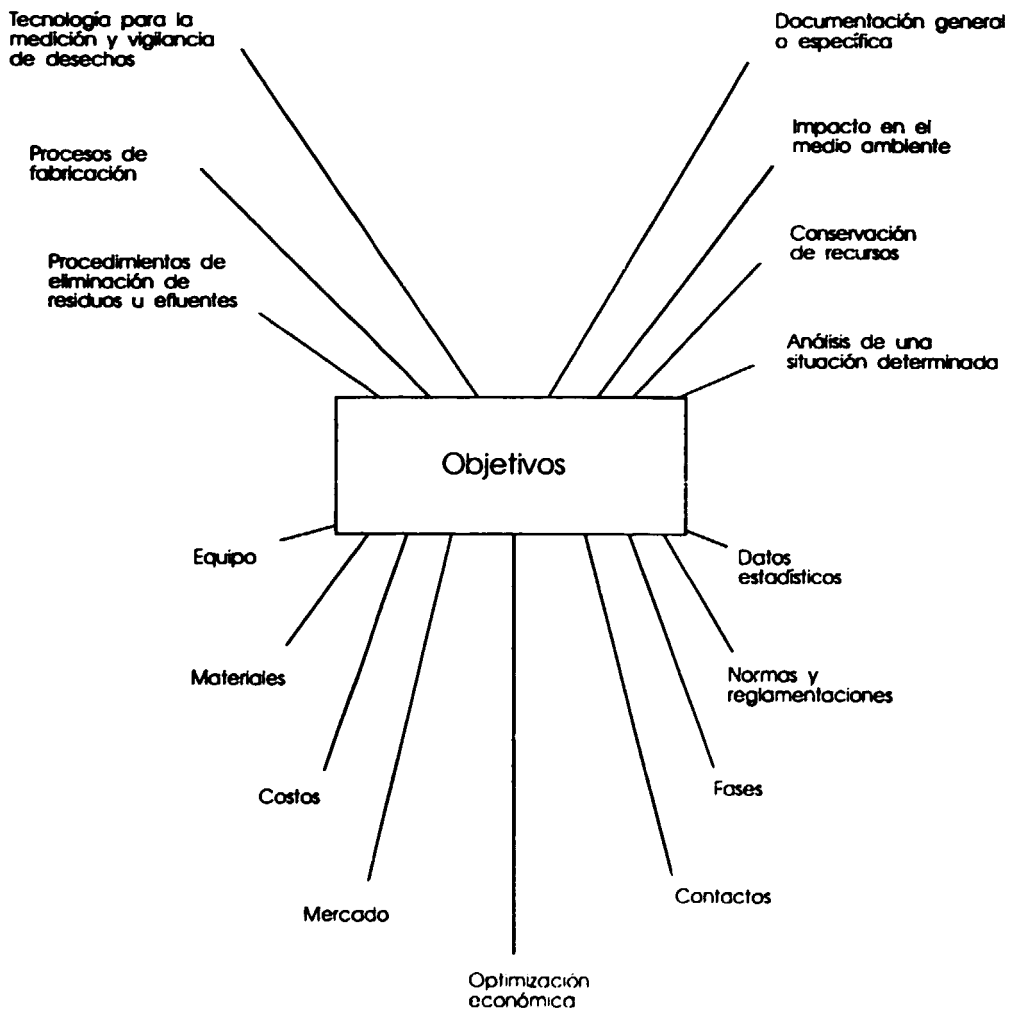


Figura 8 Objetivos y utilización de la información

## FASE 3: SELECCIONAR LOS MEDIOS DE INFORMACIÓN A UTILIZAR

- Utilizar, como guía, las observaciones formuladas en el párrafo 3
- Véase el cuadro 3, llenado según se pidió en la fase 2b;
- Consúltense las condiciones previas de suministro anteriormente fijadas (fase 1, párrafo 5), relativas a los plazos, al costo total posible, al tiempo posible a consagrar y a la precisión deseada de la información;
- Sígase el orden de prioridad de búsqueda de la información procediendo de la siguiente manera.

### 10. ¿QUÉ MEDIOS DEBEN SELECCIONARSE?

#### 10.1 BUSCAR EN LA ENTIDAD EN QUE ESTÉ EMPLEADO EL INGENIERO:

- Las fuentes de información internas identificadas en el cuadro;
- Las fuentes de información externas que puedan encontrarse en la entidad, sobre todo si ésta dispone de un servicio de documentación;
- Consígnense en el cuadro.

Conviene no dedicar más que el tiempo compatible con la prioridad de la información buscada y con el tiempo total disponible para buscar toda la información.

#### 10.2 BUSCAR EN EL PROPIO PAÍS DE LA ENTIDAD DE QUE SE TRATE:

- Los proveedores de información que se ocupen del tema o de los temas de la información a buscar;
- De entre estos proveedores, selecciónense aquellos que exploten los recursos de información identificados en el cuadro;
- Especifíquense, para estos últimos
  - El objetivo;
  - Lo que hacen
  - El medio de consultarles

- Las condiciones para obtener información: costo y grado en que la documentación se procesa

- La credibilidad;

- Selecciónense aquellos proveedores que mejor cumplan los requisitos previstos;
- Señálese en el cuadro lo que pueda obtenerse de esas entidades.

La búsqueda de posibles proveedores se efectúa mediante:

- La consulta de la parte II del *Guía*;
- La consulta de repertorios;
- La experiencia personal o la de otros colegas.

#### 10.3 EXAMINAR

Es necesario examinar:

- La información que pueda obtenerse sobre el terreno y en el país;
- El costo de esa información y los plazos para obtenerla;
- Las prioridades que sea posible satisfacer;
- Las insuficiencias o lagunas por orden de prioridad;

También es necesario evaluar, teniendo en cuenta las condiciones establecidas los proveedores a quienes esté justificado consultar y la necesidad o la inutilidad de buscar otros proveedores.

#### 10.4 BUSCAR OTROS PROVEEDORES DE INFORMACIÓN

En el caso en que sea necesario consultar a otras entidades de información:

- Consúltense en primer lugar a organizaciones internacionales, adoptando el mismo procedimiento que el propuesto para los proveedores nacionales de información (punto 10.2 supra);
- Proceder a un examen como se ha indicado en el punto 10.3 supra;
- Si es necesario, búsquense de la misma forma proveedores de información en países extranjeros, elegidos en función del origen de las fuentes de información a obtener.

La búsqueda de estas entidades se efectúa de la misma manera que la de los "proveedores nacionales de información" (punto 10.2 supra).

## **11. COMO CONSULTAR A LOS PROVEEDORES DE INFORMACIÓN ELEGIDOS**

### ***11.1 CONFECCIONAR LA LISTA DE LAS ENTIDADES A CONSULTAR***

Consúltese el cuadro 3 y, para cada uno de los organismos, indíquese:

- La información esperada;
- Las fuentes de la información procesada;
- El modo de consulta seleccionado;
- El plazo posible;
- La dirección geográfica y postal;
- La fecha de consulta.

### ***11.2 CONSULTAR A CADA UNA DE LAS ENTIDADES***

A tal fin, conviene especificar:

- Qué es lo que se necesita, es decir, por qué se busca la información;
- La información esperada y las fuentes objeto de búsqueda;
- La información de que ya se dispone;
- La precisión deseada;
- El plazo posible;
- La manera de llegar a un acuerdo con respecto a los costos.

### ***11.3 CONTROLAR LA LLEGADA DE LAS RESPUESTAS***



Anótese los resultados de la sección 7 en el cuadro 1

TEMA	ESFERA												
	Desechos sólidos	Emisiones gaseosas	sustancias tóxicas	Productos químicos	- detergentes	- plaguicidas	- fertilizantes	- otros productos	Metales pesados	Radioactividad	Ruido	Salud	...
Legislación Reglamentación Normas	b	3											
Impacto en el medio ambiente Problemas de emplazamiento	b	2-3											
Análisis de la situación Datos numéricos	a-b c	3											
Tecnologías de medición y vigilancia		3											
Procedimientos para la eliminación de residuos y efluentes	a-b c	3											
Procesos de fabricación													
Productos													
Equipo y material	a-b												
Costos	a-b												
Mercado	c	1-3											
Optimización económica													
Reciclaje	c												
Contactos													
Cursos de capacitación													
Estadísticas													
...													

Nota: Los ejemplos utilizados son los siguientes:

- a Instalación de un servicio municipal para evacuación de basuras caseras
  - b Elección de un sistema de tratamiento de residuos municipales sólidos
  - c Instalación de un sistema selectivo de recogida de basuras (o tratamiento selectivo) para la recuperación y el reciclaje de residuos sólidos
1. Costo de una planta de depuración de aguas residuales
  2. Localización de una planta de depuración de aguas residuales
  3. Selección de una planta de depuración de aguas residuales

Cuadro 1 Fase 1: Información a buscar

PRIORIDAD DE BÚSQUEDA	TEMAS	PERIODO ABARCADO				ORIGEN																																
		> 1 año	1 <- 2 años	2 <- 3 años	3 <- 5 años	En el país		En países extranjeros																														
						¿En qué países?	Organizaciones internacionales																															

Cuadro 2 Fase 2a: Características de la información buscada



## CONCLUSIONES

El método propuesto permite minimizar las dificultades de información señaladas en la introducción. También permite informarse con la máxima eficacia y en las mejores condiciones en cuanto a costo y plazos.

No obstante, el ingeniero puede cuestionar la validez de este método y preguntarse si no es demasiado complicado. Creemos que el procedimiento es sencillo y que la aparente complicación es el resultado de la necesidad de determinar con exactitud por qué se desea la información. Esa determinación o análisis simplifica la búsqueda de información porque permite concentrarla en lo esencial.

Una aparente dificultad es el rigor con que se procede en la elección de información y de proveedores. En realidad, lo que se requiere es un cambio de hábitos en la adquisición de información.

La mayoría de los ingenieros, aunque están habituados a proceder con rigor en la elección de proveedores, no son tan estrictos cuando tratan de obtener información. Sólo se dirigen a las fuentes que conocen, especifican mal lo que quieren y, con gran frecuencia, pierden mucho tiempo en investigaciones realizadas un tanto al azar.

Por esa razón, la aplicación de este método re-

quiere capacitación para cambiar malos hábitos y adquirir nuevos reflejos. Estos se adquieren con gran rapidez.

Está justificado el método en todos los casos? Un análisis de lo que se quiere hacer, y que constituye la base del presente método, es siempre necesario, cualquiera que sea la información que se busque.

Tal análisis permite ganar tiempo y evita que se actúe al azar. A menudo, evita incluso la búsqueda propiamente dicha de la información.

El método es también aplicable cuando el ingeniero sabe de antemano a quién consultar. La mayor parte del tiempo, existen, para el caso de que se trate, otras posibilidades de información más eficaces pero que el ingeniero desconoce.

El método es indispensable cuando se consulta un anuario.

La aplicación del método se orienta por el tiempo que es posible dedicar a la búsqueda de información para la tarea prevista. El método será tanto más sencillo si el objetivo para el que se busca la información es sencillo y sólo justifica un breve período de investigación. Y, por el contrario, será complicado si se utiliza para una acción compleja que entrañe un período considerable de trabajo.

# ANEXO 1

## ELECCION DE LA FUENTE DE INFORMACIÓN

### en función del objetivo perseguido

#### ¿Un libro?

Para aprender los rudimentos de la técnica.

Para conocer el efecto de los residuos, con o sin filtro.

#### ¿Un periódico?

Para estar al corriente de los nuevos productos, procesos, competidores, etc.

#### ¿Un informe?

Para saber cuáles son las mejoras posibles en términos de economías, circuitos o resultados de la introducción de un nuevo material en el mercado de filtros al que dirijo mis exportaciones.

#### ¿Un texto oficial regulador?

Para saber qué es lo que hay que respetar en materia de seguridad y control.

#### ¿Una norma?

Para conocer las especificaciones o dimensiones de los materiales.

Para saber cuáles son los límites de eficiencia impuestos, en términos de cantidad y duración, respecto de un determinado producto residual.

*¿Qué filtro responde mejor a mis necesidades?*

#### ¿Una patente?

Para enterarme de una nueva invención o para saber si puedo patentar una determinada mejora.

#### ¿Un catálogo del proveedor?

Para conocer los modelos disponibles en el mercado, sus características, capacidad, y precio.

#### ¿Una banco de datos numéricos?

Para calcular determinadas características o evaluar el mercado.

#### ¿Una muestra?

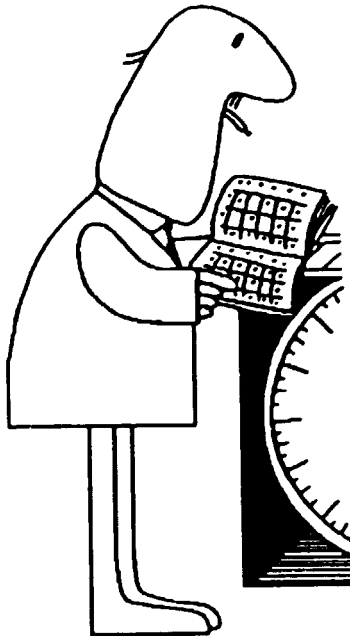
Para saber cómo está diseñado el modelo.

#### ¿Un especialista?

Para obtener asesoramiento sobre la elección del filtro y su instalación en condiciones específicas.

#### ¿Un programa?

Para ayudar a calcular y a diseñar un nuevo filtro.



Fuente: adaptado de "La gestion de l'information dans l'entreprise", A. David & E. Sutter, Afnor, Ed. Ayrrolles, 1985, pág. 64.

## ANEXO 2

### Categorías de proveedores de información

De acuerdo con sus especialidades, se identifican cuatro categorías de proveedores de información (véase la figura 9):

Departamentos de la organización que emplea al ingeniero;

Grupos con los que trabaja esa organización ;

Proveedores de información profesionales ;

Oficinas gubernamentales.

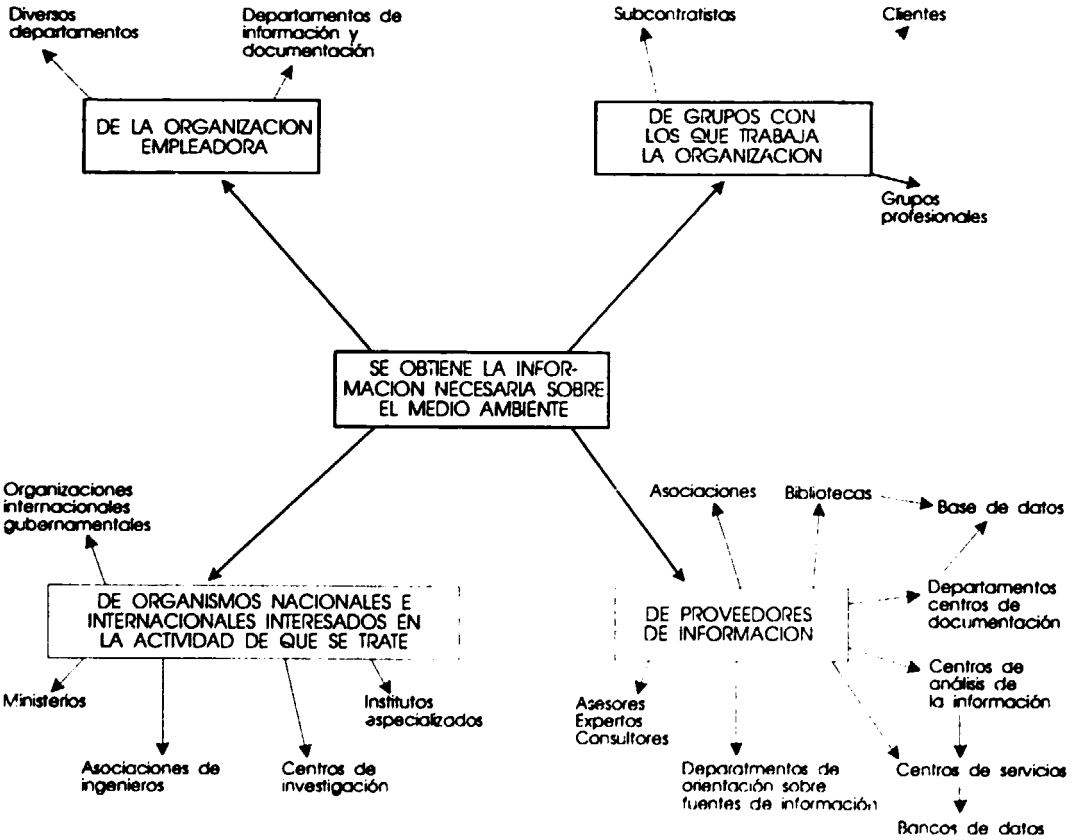


Figura 9 Categorías de proveedores de información

- **Bibliotecas**

Estas entidades tienen, desde la perspectiva de coleccionar documentos, diversos objetivos. Conviene conocerlas con objeto de poder elegir acertadamente aquéllas de que se tenga necesidad. Se las distingue según:

- Las características de los soportes: escrito, disco, cintas magnéticas, películas, objetos;
- El tipo de documentos escritos: ciertas bibliotecas coleccionan libros o publicaciones periódicas; otras, informes de investigación; y otras, por último, patentes;
- La responsabilidad de la conservación: archivos, bibliotecas nacionales, bibliotecas especializadas de carácter nacional, oficinas nacionales de patentes, por una parte, y bibliotecas públicas, de empresas, de escuelas, por otra;
- El campo abarcado: algunas están especializadas en un determinado sector de conocimientos, mientras que otras, por el contrario, son de carácter multidisciplinario;
- Los usuarios a quienes atienden.

- **Servicios y centros de documentación**

Se ocupan de reunir datos sobre las informaciones contenidas en los documentos y de referenciar éstos. También pueden clasificarse según:

- La naturaleza de los documentos objeto de referencia. Ciertos centros coleccionan toda clase de documentos, mientras que otros, por el contrario, sólo se ocupan de determinados documentos;
- El campo o los campos de interés, según que el centro se ocupe de una misión dada o de una determinada disciplina;
- Las tareas realizadas y los servicios ofrecidos;
- La clientela prevista y la accesibilidad. Los centros pueden ser

- Internacionales (concebidos y organizados para responder a las necesidades de varios países)

- Nacionales (atienden, para la misión que se les ha confiado, las necesidades de un país)

- Profesionales (atienden las necesidades de una profesión)

- Individuales (concebidos específicamente para una determinada entidad);

- **Centros de análisis de la información**

Su objetivo es explotar el contenido de los documentos con objeto de facilitar información adaptada a necesidades específicas. Estos centros atienden solicitudes de información, publican notas de síntesis y bancos de datos numéricos o factuales.

Estos centros se clasifican con arreglo a los mismos criterios que los anteriores.

- **Centros servidores**

Recogen, y hacen accesibles mediante un servicio a distancia, bancos de datos bibliográficos, numéricos y factuales.

- **Servicios de orientación a las fuentes de información.**

- **Agrupaciones de entidades o de especialistas que pueden poner en relación con fuentes de información vivas (consejeros, expertos, consultores), tales como las agrupaciones profesionales, las asociaciones, los centros de investigación o los institutos especializados.**

Con gran frecuencia, estas agrupaciones disponen de sus propios servicios de información que pueden también orientar a los solicitantes a las fuentes de información pertinentes (clase precedente).

Existen también repertorios nacionales por tipos de agrupaciones, que pueden consultarse en los servicios de documentación e información de las principales administraciones nacionales pertinentes.

## **PART II**

**THE MEDIA AND SUPPLIERS**

## **DEUXIEME PARTIE**

**LES MEDIA ET LES FOURNISSEURS**

## **ZWEITER TEIL**

**INFORMATIONSTRÄGER UND-LIEFERANTEN**

## **SEGUNDA PARTE**

**LOS MEDIOS DE COMUNICACIÓN Y PROVEEDORES**



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**AREAS OF ACTIVITY FOR INSTITUTIONS**

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**Administration**

0029 Bangladesh  
 0046 Canada  
 0059  
 0368 Europe Region  
 0155 India  
 0163 Israel  
 0166 Jamaica

**Association**

0027 Australia  
 0031 Belgium  
 0032  
 0045 Canada  
 0370 Europe Region  
 0372  
 0074 France  
 0084  
 0099 Germany  
 0111  
 0142 India  
 0002 Interregional  
 0005  
 0006  
 0007  
 0009  
 0013  
 0180 Malaysia  
 0226 Sweden  
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**Commerce**

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**Information**

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 0363 Asia/Pacific Region  
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AREAS OF ACTIVITY FOR INSTITUTIONS

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0087	0178	0355
0089	0181 Malta	0356 Venezuela
0090	0182	0357 Yugoslavia
0091	0184 Mexico	0358 Zambia
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0094	0188	<b>Research</b>
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0101	0191 Netherlands	0365 Asia/Pacific region
0102	0201	0028 Austria
0117	0203	0030 Belgium
0121 Ghana	0376 North America Region	0038 Brazil
0122 Greece	0211 Norway	0041 Canada
0123	0212 Papua New Guinea	0042
0124 Guatemala	0213 Peru	0043
0125	0214 Philippines	0049
0126 Hungary	0221 Spain	0050
0127	0222 Sri Lanka	0054
0128	0229 Sweden	0056
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0137	0238 Thailand	0063
0154	0240 Tunisia	0069 Egypt
0156	0266 United Kingdom	0070
0158 Indonesia	0267	0071
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0005	0277	0375
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**Technical assistance**

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 0121 Ghana  
 0145 India  
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 0003 Interregional  
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0179 Libyan Arab Jamahiriya  
 0236 Switzerland  
 0238 Thailand

**0001 AKZO Engineering B.V.**

Velperweg 76  
Postbus 9300  
NL-6800 SB Arnhem  
Netherlands

Multi-national producer of salt, chlorine and chlorine based products, especially chemicals, paints and varnishes, pharmaceuticals, polymers and manmade fibres. Within the industry/environment sector, offers specialized competence in industrial safety, risk analysis and combustion of chemical waste. [INST-GUID00058]

**0002 Bureau International de la Récupération (BIR)**

13 Place du Samedi  
1000 Brussels  
Brabant  
Belgium

International association for the promotion of recovery and recycling of materials. Topics include: recycling; paper wastes; metals; non-ferrous metals; textiles; plastics; rubber. [INST-WFEO00019]

**0003 Commonwealth Agricultural Bureau (CAB International)**

Farnham House  
Farnham Royal  
Slough SL2 3BN  
United Kingdom

Provides Commonwealth countries with indexed information on agriculture and natural resources - their use, preservation and trends - as well as related fields of applied biology. Topics include: economics and sociology; engineering; human and animal nutrition; animal breeding and genetics; animal health; dairy science; bio-deterioration; entomology and nematology; medical and veterinary mycology; parasitology; forestry and forest products; horticulture and plantation crops; pastures and field crops; plant breeding and genetics; plant pathology; soils and fertilizers; weed control equipment; leisure, recreation and tourism; rural development and sociology. [INST-WFEO00021]

**0004 Commonwealth Scientific and Industrial Research Organization (CSIRO)**

Information Library and Editorial Section  
P.O. Box 225  
Dickson  
A.C.T. 2602  
Australia

Collection and dissemination of information supplied by the many divisions of CSIRO Research Institute. Topics include: irrigation; water and land resources (agricultural land, land use, ecosystems); animal health and production; applied organic chemistry (pest control, pesticides, insecticides); atmosphere (pollution); energy chemistry and pollution; entomology (pesticides, wildlife); environmental mechanics

(air-water interaction); fisheries research; forest research (afforestation and reforestation); fossil fuels (air pollution and air quality); geo-mechanics; ground water. [INST-WFEO00051]

**0005 Groupement International des Associations Nationales de Fabricants de Produits Agrochimiques (GIFAP)**

Documentation Centre  
12 Avenue du Hamoil  
1180 Brussels  
Belgium

Collection and dissemination of information relative to the use of agro-chemicals in agriculture and checking conformity to agricultural and social needs, while introducing the minimum amounts of toxic substances into the environment and food. Topics include: crop protection; environment; ecology; toxicology; health; agricultural development; soils; surface and underground water bodies; coastal waters; water supply; agro-chemicals: fertilizers, pesticides; pollutants. [INST-WFEO00022]

**0006 Industry Cooperative for Ozone Layer Protection**

Suite 300  
1440 New York Avenue, N.W.  
Washington, D.C. 2007  
United States

Organization with institutional members from industry, promoting and coordinating world-wide exchange of non-proprietary information on substitute technologies, substances and processes for chlorofluorocarbon (CFC) solvents in the electronics industry. Operates the OZONET data base. [INST-GUID00188]

**0007 International Copper Research Association Inc.**

708 Third Avenue-27th Floor  
New York, New York 10017  
United States

Publishes technical information on copper and related metallurgical topics such as plating, corrosion, toxicity, hazardous wastes etc. [INST-GUID00039]

**0008 International Environment Bureau (IEB)**

ICC-OEE  
P.O. Box 301  
N-1324 Lysaker  
Oslo  
Norway

Specialized division of the International Chamber of Commerce (ICC) funded by major industrial companies. Responds to requests for environmental information on pollution control and management systems used by industry. [INST-GUID00171]

**0009 International Petroleum Information for Environment and Conservation of Nature (IPIECA)**

1 College Hill  
London EC4R 2RA  
United Kingdom

Co-ordinating body through which the oil industry responds to environmental initiatives of the UN Environment Programme and other UN agencies and international organizations concerned with environmental protection. Topics include: marine environment; hazards; combatting accidental oil pollution; organic pollutants; water/air interface and interrelations; marine currents; biodegradation; air pollution and abatement; pollutant emissions; chemicals; lifetime of pollutants. [INST-WFEO00023]

**0010 International Referral Centre for Collective Water Supply and Water Treatment (IRC)**

P.O. Box 93190  
2509 AD  
La Haye  
Netherlands

Contributes to the generation, transfer and improvement of knowledge for water resources management and waste water treatment. Also provides advisory and information services. Develops technology transfer, professional training, and community co-operation and programme planning. Topics include: water resources and purification; wastes; pollutants; pollution criteria; water improvement and treatment programmes; technology transfer. [INST-WFEO00020]

**0011 International Standardization Organization (ISO) Referral Centre**

1 rue Varembe  
CH-1211 Geneva 20  
Switzerland

Develops standards for worldwide use and co-operates in the intellectual, scientific, technical and economic fields. Also covers: acoustics; air, water and soil quality; thermal insulation; firing characteristics of materials; vibrations and mechanic response to shocks; ergonomics; protection against radiation; toxicity of chemicals; occupational safety. [INST-WFEO00025]

**0012 International Union for Conservation of Nature and Natural Resources (IUCN)**

Avenue du Mont Blanc  
CH-1196 Gland  
Switzerland

Monitors world environmental quality through collection of numerical data. Produces various lists, inventories and directories. Topics include: assisting (through consultants, experts, technical and financial aid) developing countries or any organization in the field of environment assessment and protection. Provides training and education and helps research in natural resources management and environmental protection. Topics include: ecosystems; animal and plant

species (migrations; endangered species; protected species); biological resources; environmental monitoring; pollutants and their impacts; resource management and conservation; fauna and flora habitats; historical, archaeological sites; national parks and protected reserves; natural and cultural heritage; environmental priorities; pollution control; scientific and technical information; standardization; environmental legislation; policy. [INST-WFEO00029]

**0013 International Union of Air Pollution Prevention Associations (IUAPPA)**

136 North Street  
Brighton  
East Sussex BN1 1BG  
United Kingdom

Promotes knowledge and international co-operation on air pollution and air pollution control technology. Provides information about the association's activities and national legislation. Topics include: industrial emissions; transport-related gaseous emissions; air quality; air pollution; pollutants; particulates; gaseous pollutants; transnational pollution; scientific and technical information; environmental legislation; air pollution legislation and control technology; environmental statistics. [INST-WFEO00024]

**0014 Organisation for Economic Co-operation and Development (OECD)**

Information and Publication Centre  
2 rue André Pascal  
75016 Paris  
France

Records and studies the characteristics of past and actual economic growth and its trends. Topics include: agriculture; planning; employment and unemployment; co-operation and international trade; environmental policy; statistics; pollution; hazardous substances; radioactive wastes; toxic substances; pollution control regulations; transnational pollution; urban planning; energy sources and fuels; nuclear energy; energy research centres; technology transfer and development. [INST-WFEO00026]

**0015 Renewable Energy Resources Information Centre (AIT/ERIC)**

Asian Institute of Technology  
P.O. Box 2754  
Bangkok  
Thailand

Responsible for information on new and renewable energy. Also involved in technology transfer and co-operation projects. Topics include: intermediate or appropriate technology; solar energy; solar heating; biofuels; wind energy and small scale hydropower; animal dung as fuel; biogas; biomass; geothermal energy; tidal energy; wave energy. [INST-WFEO00027]

**0016 Scientific Committee in Charge of Environment Programmes (ICSU/SCOPE)****International Centre of Scientific Organizations Union  
Information and Documentation Centre**51 Blvd de Montmorency  
75016 Paris  
France

Topics include: impact of human activities on environment; environmental assessment (specific attention given to global influence or effects); man and environment; air pollution; ecosystems; pollutants: long-term effects, measures, control and monitoring; legislation; toxic substances; hazardous substances. [INST-WFE000028]

**0017 The World Conservation Union (WCU/IUCN)****EIA Service**Avenue du Mont Blanc  
CH-1196 Gland  
Switzerland

Non-governmental organization, providing governments of developing countries with technical assistance in initiation, implementation, review, training and establishment of institutional framework relative to environmental impact assessment. Also provides advice on the likely environmental effects of industrial development and appropriate measures to be taken. Advises on environmental planning and environmental management at the industry/environment interface. Links with other parts of IUCN can provide a wide range of information services on sustainable development. [INST-GUID00001]

**0018 World Environment Centre (WEC)**605 Third Avenue  
17th Floor  
New York NY 10158  
United States

Technical and financial assistance (no charge - in collaboration with US AID) and training activities regarding environmental management, especially for developing countries. Topics include: international conferences; special audits on industry/environment relationships (in developing countries); impact assessment; industrial siting; pollution control measures (in air, water, soil); noise; impact assessment; pollutants; hazards; industrial sites; ecosystems; water, air and soil quality; human health; environmental policy, legislation and management; standards; economic development; rural development; nature conservation. [INST-WFE000030]

**0019 World Resources Institute (WRI)**1735 New York Avenue NW  
Washington D.C. 20006  
United States

Research Centre for environmental policy. Aims to help governments and industry to manage natural resources and environment while sustaining human needs and economic

growth. Collects and disseminates (publishes) data on environment and informs about natural resources and environment. Topics include: forests; agriculture; biological diversity; energy; climate change; pollution and health; economic incentives for sustainable development; resource and environmental information; destructive effects of poor resource management on economic development; alleviation of poverty in developing countries; new and globally important environmental and resource problems in industrial countries; environmental legislation. [INST-WFE000031]

**0020 Worldwatch Institute**1776 Massachusetts Avenue NW  
Washington, D.C. 20036  
United States

Organization seeking to identify emerging global problems and trends. Publishes its analyses through World Watch papers and books. Covers the whole range of environmental topics and sectors. [INST-GUID00164]

ALGERIA

0021 Ministère de l'Hydraulique, des Forêts et de la Pêche  
Centre de Documentation

Ex Grand Séminaire

Kasba

Algiers

Algeria

Collection and dissemination of information on the state of natural resources in the country (quality, volume), their management and exploitation, including pollution control, and ecosystems. Topics include: water resources; hydraulics; barrages; watersheds; limnology; soil conservation; irrigation; geology; civil engineering; industrial pollution; pollution control; water treatment; potable water; solid wastes management; natural resources; national parks; nature protection; ecosystems; law; regulations. [INST-WFE00047]

ARGENTINA

0022 Centro Argentino de Referencia en Ingeniería Sanitaria y Medio Ambiente (INCYTH/CARIS)

Instituto Nacional de Ciencia y Técnica Hídricas

Aeropuerto Internacional Ezeiza c.c. No.7

Buenos Aires 1802

Argentina

Public information and provision of foreign data bases through 19 CAICYT terminals. Topics include: waste water treatment; water pollution control; sanitation equipment; health protection; safety; disease; sanitation; models and simulation. [INST-WFE00048]

0023 Centro de Investigación de Ingeniería Ambiental (CIIA)

Paseo Colon 850 4 Piso

Buenos Aires 1063

Argentina

Research and technical assistance centre covering: liquid wastes; occupational health; soil contamination. [INST-WFE00049]

0024 Centro de Investigación Documentaria (INTI/CID)

Instituto Nacional de Tecnología Industrial

Casilla 1359

Buenos Aires 1000

Argentina

Collection and dissemination of information from other national and regional sources. Topics include: all sectors of industry; industrial development; effects on the environment. [INST-WFE00050]

AUSTRALIA

0025 Australian Newsprint Mills Limited

Boyer

Tasmania 7140

Australia

Manufacturer of newsprint and other types of paper, with research experience relating to: effluent treatment from newsprint mill using eucalyptus timber as raw materials; operation of chlorine-caustic plant; manufacture of newsprint from P. Radiata; thermo-mechanical pulping. [INST-GUID00200]

0026 N.S.W. Dairy Corporation

P.O. Box 48

Broadway

New South Wales 2007

Australia

Government agency responsible for control of the dairy products industry in New South Wales in respect to processing, marketing and distribution. [INST-GUID00002]

0027 Packaging Council of Australia (PCA)

P.O. Box 1469N

Melbourne

Victoria 3001

Australia

Trade association for the packaging sector. Has expertise on environmental effects of packaging, in particular recycling, waste management and resources conservation. [INST-GUID00160]

AUSTRIA

0028 Versuchsanstalt fuer Lederindustrie

HBLVA fuer Chemische Industrie

Rosensteingasse 79

A-1170 Wien

Austria

Research centre (part of technical college for chemical industry) undertaking: testing of leather and leather goods; by-products and effluents; research and development; adaptation and or development of new products and procedures; maintenance of an advisory service for problems regarding environmental effects of leather industry. [INST-GUID00150]

BANGLADESH

0029 Department of Environment

Publicity Department

6/11-F Lalmatia Housing Estate

Sat Masjid Road

Dhaka-1207

Bangladesh

Government agency responsible for pollution control policies regarding water pollution and air pollution in Bangladesh. [INST-GUID00151]

**BELGIUM**

**0030 Belgian Centre of Studies and Documentation on Water, Air and Environment (CEBEDEAU)**  
Documentation Centre

2 rue Armand Stevart  
4000 Liege  
Belgium

Research laboratory specialized in the sanitary aspects of water (rivers, urban and industrial sanitation). Topics include: waste water purification; self cleansing; sludge digestion; corrosion of materials; atmospheric pollution; means and methods of analysis. [INST-WFEO00054]

**0031 Belgian Solid Waste Association (BESWA)**

1 Ruimingskaai  
1000 Brussels  
Brabant  
Belgium

Waste management services, i.e. all activities dealing with collection, transportation, treatment and recycling of wastes. Also winter service and maintenance of sewage systems. Topics include disposal, storage and processing. [INST-WFEO00053]

**0032 Groupement Belge des Techniques et Equipements de Lutte Contre les Nuisances (ANTIPOL)**

21 rue des Drapiers  
1050 Brussels  
Brabant  
Belgium

Manages permanent directories of firms and societies specializing in water treatment, gas cleaning, noise reduction and waste treatment. Topics include: water pollution; noise reduction; waste management. [INST-WFEO00052]

**0033 Information and Documentation Centre on Environment (CIDE)**

49 rue d'Arion  
1040 Brussels  
Belgium

Topics include: energy; land use; land management; urbanization; laws, regulations and rules. [INST-WFEO00055]

**BOLIVIA**

**0034 Centro Nacional de Documentación Científica y Tecnológica**

Camacho y Ayacucho (Obelisco)  
La Paz  
Casilla 3283  
Bolivia

Collection and dissemination of scientific and technical information about industrial activities and environment. Topics include: technical assistance; training; research; education;

technology on all industrial sectors; technology transfer. [INST-WFEO00056]

**BRAZIL**

**0035 Centro de Informacoes Tecnicas (COMLURB)**

Biblioteca  
Rua Major Avila  
358/40 Pav.  
Tijuca 20511  
Rio de Janeiro-RJ  
Brazil

Information centre focusing on: waste management (collection, treatment and disposal of solid commercial, industrial and urban wastes); recycling and re-use; waste energy utilization. [INST-GUID00123]

**0036 Fundacao Centro Tecnologico de Minas Gerais (CETEC)**

Setor de Informacao Tecnologica  
Caixa Postal 2306  
Avenida Jose Candido da Silveira 2000  
30000 Belo Horizonte  
MG Brazil

Information service and training. Topics include: natural resources; mining and metallurgy; engineering; design and construction industry; food technology; chemical processing; ecology and environment; appropriate technology. [INST-WFEO00058]

**0037 Fundacao Estadual de Engenharia do Meio Ambiente (FEEMA)**

Rua Fonseca 121-16  
Andar-20940  
Rio de Janeiro - RJ  
CP 23011  
Brazil

Provides scientific and technical information needed for the management, control and protection of natural resources and human health as well as training and education on environment and policy planning. Topics include: monitoring results/assessment; appropriate technology for treatment, control and monitoring; water sanitation; technological development and technology transfer; human health; vectors of human diseases; standards; laws/rules; clean technology. [INST-WFEO00057]

**0038 Instituto de Saneamento Ambiental (ISAM)**

Biblioteca  
Pontificia Universidad Catolica Parana  
Rua Imaculada Conceicao  
1155-Prado Velao  
80000 Curitiba PR  
CP670  
Brazil



Research centre, laboratory and information centre, concentrating on: hydrological engineering (particularly sanitation, water supply, water treatment); waste disposal; industrial effluents treatment; energy issues; urban waste treatment. [INST-GUID00159]

**BULGARIA**

**0039 Commission on Environment Protection  
R&D Information Centre**

UL. Industrialna 7  
1202 Sofia  
Bulgaria  
Collection and analysis of data and information on environmental management. Studies environmental trends and perspectives and provides information for scientific and technical research on environment. Topics include: air pollution; monitoring and standards; soil protection; environmental policy; nature conservation; water pollution, quality, standards, resources, control and monitoring; waste management. [INST-WFE:000059]

**0040 Institute for Instrument Design**

Lenin Boulevard 7th km  
1184 Sofia  
Bulgaria  
Production of environment pollution control instrumentation with quality control and reliability testing. Topics include: electrical and electronic equipment. [INST-WFE:000060]

**CANADA**

**0041 Agriculture Canada, Research Station Vancouver**

6660 NW Marine Drive  
Vancouver BC V6T 1X2  
Canada  
Research centre specialized in agro-chemicals. Particular interest in the translocation, metabolism and degradation of pesticides in soil, vegetable and small fruit crops and in the chemical aspects of natural attraction of these crops to insect pests. Publications available. Topics include: health; acid rain; air pollution; heavy metals. [INST-GUID00062]

**0042 Agriculture Canada, Research Station Regina**

CDA Box 440  
Regina Sask S4P 3A2  
Canada  
Research centre concentrating on i.a.: transport of herbicides in air, water and soil; exposure estimates for herbicides; mass balance of herbicides after application on field scale; air monitoring of herbicides; drift estimates during application. [INST-GUID00158]

**0043 Alberta Environmental Centre  
Environmental Technology Division**

Post Office Bag 4000  
Vegreville  
Alberta T0B 4L0  
Canada

Research facility for applied environmental research, technology development and services in the province of Alberta. Among its activities are: the provision of environmental analysis services to public administration and the public; pest control; water and waste water management; environmental toxicity analysis; waste management. [INST-GUID00094]

**0044 Alberta Special Waste Management Corporation**

610 10909 Jasper Ave  
Edmonton  
Alberta T5J 3L9  
Canada  
Consulting firm with expertise in: hazardous waste management; location of industry; public participation; feasibility studies; technology assessment; legislation; solid waste management; recycling; incineration; landfill; waste management. [INST-GUID00087]

**0045 Canadian Petroleum Products Institute (CPPI)**

1202 275 Slater St.  
Ottawa  
Ontario K1P 5H9  
Canada  
Trade association promoting environmental concerns within the Canadian petroleum industry, including: environmental health; industrial safety; product safety with regard to toxicity; energy conservation. [INST-GUID00085]

**0046 Corporation of the City of Windsor  
Pollution Control**

P.O. Box 1607  
Windsor  
Ontario N9A 6S1  
Canada  
Municipal agency with expertise relating to: chemical engineering; mining; combustion control; heavy chemical industry; sewage, waste management and compost facility operation. [INST-GUID00157]

**0047 Department of the Environment of the Province of Alberta**

**Environmental Engineering Support and Services  
Technical Services Division**  
9820-106 St. Edmonton  
Alberta  
Canada  
Information and advice in the field of environmental engineering. Topics include: water monitoring; water stages; discharge measurements; sediment transport; sedimentation of reservoirs. [INST-WFE:000063]

**0048 Environment Canada**

**Departmental Library**  
Ottawa  
Ontario 1C7  
Canada

Public information service with collection of textual and numerical data (from all departments and offices related to Environment Canada) regarding scientific and technical aspects of fundamental and applied research, in relation to management of resources and natural sites. Topics include: air pollution; water pollution (inland and marine); soils; protection of fauna, flora, forests and natural parks; water treatment; sanitation; water management; hydrology; waste management; chemicals; pesticides. [INST-WFE:00062]

**0049 Forest Pest Management Institute**

**Forestry Canada**  
P.O. Box 490  
1219 Queen St East  
Sault Ste Marie  
Ontario P6A 5M7  
Canada

Research centre specializing in the use of viruses for forest insect pest control. Includes the formulation, application, production, registration and commercialization of biological control products. Runs an environmental impact project. [INST-GUID00089]

**0050 Health & Welfare Canada**

**Health Protection Branch**  
Tunney's Pasture  
Ottawa  
Ontario K1A 0L2  
Canada

Government agency with expertise relating to food technology, food preservation and toxicology, including methods of analysis and testing. [INST-GUID00156]

**0051 Industrial Research Centre of Quebec (CRIQ)**

**Industry Information Centre**  
333 rue Franquet  
Case Postale 9038  
Sainte-Foy  
Quebec G1V 407  
Canada

Development of small- and medium-sized enterprises in Quebec. Maintains information and reports on industrial activities of these enterprises and keeps track of trends as well as to forecast their evolution. Supplies technical services and assistance for research & development activities to sustain technological growth of industry. [INST-WFE:00064]

**0052 Lakefield Research (a Division of Falconbridge Ltd.)**

185 Concession Street  
Postal Bag 4300

Lakefield  
Ontario K0L 2H0  
Canada

Consulting firm which undertakes studies of mine and mill effluent tailings, slurries and waters. Specialized competence in: cyanide destruction; heavy metals precipitation, suspended solids removal; environmental analysis and testing; chemical analysis; industrial waste. [INST-GUID00120]

**0053 Lavalin Environment**

1100 Dorchester Blvd.  
Montreal  
Quebec H3B 4P3  
Canada

Consulting firm offering international services, including environmental impact assessment, risk analysis, resource inventories and site selection, as well as design and implementation of waste management and water treatment projects. [INST-GUID00209]

**0054 Manitoba Environment**

**Terrestrial Quality Section**  
Bldg. #2  
139 Tuxedo Avenue  
Winnipeg  
Manitoba R3N 0H6  
Canada

Research centre studying: deposition and accumulation of lead in urban soils, emissions from smelting and automobiles and in residues of paints and varnishes; environmental effects of nickel, copper and zinc mining and smelting; soil pollution by heavy metals; forestry operations; mapping for acid rain; herbicides. [INST-GUID00117]

**0055 Ministry of Environment of Quebec**

**Documentation Centre**  
2360 Chemin Sainte-Foy  
Sainte-Foy  
Quebec G1V 4H2  
Canada

Topics include: biophysical inventions; environmental impact; environmental assessment; socio-economic aspects; environmental quality; pollution control. [INST-WFE:00061]

**0056 Ortech International**

Sheridan Park Research Community  
Mississauga  
Ontario L5K 1B3  
Canada

Research centre specialized in industrial waste management, including minimization, reduction, reuse, recycling, recovery and exchange of industrial wastes. Special interest in: metal finishing industries; landfill gas generation; consulting and testing for compliance with regulations; environmental impact assessment (EIA). [INST-GUID00088]

**0057 Petro Canada  
Environmental Services**

Petro Canada Inc.  
5140 Younge St.  
North York  
Ontario M2N 6L6  
Canada

Consulting firm specialized in environmental protection, particularly related to air pollution control and waste management. Provides services on environmental management in general, research and development in environmental sciences and environmental auditing. [INST-GUID00096]

**0058 Pulp & Paper Research Institute of Canada**

570 St. John's Blvd.  
Pointe Claire  
Quebec H9R 3J9  
Canada

Research centre specialized in pulp and paper technology with expertise in monitoring of sulphurgases from, e.g., kraft pulping in paper manufacture and in air pollution reduction by wet-scrubbing of total reduced sulphur gases. [INST-GUID00080]

**0059 Water General Direction (WATDOC)**

Environment Canada  
Ottawa  
Ontario K1A 0E7  
Canada

Collection of information on water from the various departments and services of the Canadian administration. Topics include: water resources; other subjects related to environment in Canada. [INST-WFEO00065]

**CHILE**

**0060 Centro de Información y Documentación (CI/INTEC)  
Instituto de Investigaciones Tecnológicas**

Casilla 667  
Avenida Santa Maria 06500 (Lo Curro)  
Santiago  
Chile

Topics include: industrial products and processes; chemical industry; metalworking industry; food industry; manufacturing of machinery; industrial management; natural resources and environment. [INST-WFEO00066]

**0061 Empresa Nacional del Petroleo**

Ahumada 341  
Casilla 3556  
Santiago  
Chile

State-owned oil company, engaged in most areas of petroleum exploration, petroleum refineries, production and marketing of petroleum products. [INST-GUID00043]

**CHINA**

**0062 Beijing Central Engineering & Research Incorporation of Iron and Steel Industry**

No. 4 Baiguang Road  
Beijing  
China

Research centre specialized in iron and steel production, with particular expertise in environmental impact assessment (ELA). [INST-GUID00118]

**0063 Hydrobiology Institute Academia Sinica**

Library  
Wuhan  
Hubei  
China

Research centre focusing on biological methods and principles of effluent treatment, especially petroleum-degrading algae and production of algae/bacteria symbiosis for use in waste water. [INST-GUID00101]

**COLOMBIA**

**0064 Centro de Documentación Rafael M. Salas (UPB)**

Universidad Pontificia Bolivariana  
Apartado Aereo 1178  
Medellin  
Colombia

Information centre oriented towards fundamental and applied research together with the University. Provides environmental support for national development projects and programmes. Topics include: pollution control; appropriate technology; environment training; ecology; biogas; solar energy; energy conservation; renewable energy; energy sources; demography. [INST-WFEO00067]

**0065 Servicio de Información Técnica Industrial (IIT/SIN-TAL)**

Instituto de Investigaciones Tecnológicas  
Apartado Aereo 7031  
Carrera 30 52A-77  
Bogota  
Colombia

Topics include: food industry quality control, standards, packaging; chemistry; agro-industry; metal-working industry; fuels; coal; biogas; water pollution; urban wastes; waste disposal; air pollution; feasibility studies; technology transfer. [INST-WFEO00068]

**DENMARK**

**0066 Danmarks Tekniske Bibliotek (Danish Technology Library)**

Dokumentationsafdelingen (Documentation Centre)  
1 Anker Englands Vej

DK-2800 Lyngby  
Denmark

Literature referral service based on international data banks for research and industrial bodies. Topics include: biochemistry; biotechnology; rock mechanics; hydraulics; chemistry; metallurgy; process technology; planning of research; services; public; environmental research; environmental information; industrial and urban solid and liquid wastes. [INST-WFEO00069]

0067 Teknologisk Institut (Technology Institute)  
Informationsafdelingen (Information Department)  
Gregersensvej  
DK-2630 Tastrup  
Denmark

Provides information on technological progress to benefit industry and the community at large. Topics include: technology; air quality control; industrial and urban wastes; chemicals; urban and industrial waste water; re-utilisation; waste treatment; management and destruction; sludge treatment; sewage; noise abatement; noise measurements; maps; building acoustics; cost-benefit relations; location factors; energy saving; energy technology; harmful substances. [INST-WFEO00070]

ECUADOR

0068 Centro de Desarrollo Industrial del Ecuador (CENDES/SIAT)  
Servicio de Información a Asistencia Técnica  
Apartado 5833  
García Avilés 217 y 9 de Octubre  
Guayaquil  
Ecuador

Topics include: food industry; agro-industry; chemical industry; environmental pollution; appropriate technology; patents. [INST-WFEO00071]

EGYPT

0069 Cairo University  
Faculty of Engineering  
Sanitary Engineering Department  
Hadara  
Alexandria  
Egypt

Research on development and application of sanitary engineering. Topics include: waste recycling and recovery; waste utilization; waste water treatment. [INST-WFEO00074]

0070 Cairo University  
Water Research Centre  
Hadara  
Alexandria  
Egypt

Studies long-term policy on accessibility and rational use of water, in relation to irrigation and drainage system development. Topics include: data collection; site monitoring; water distribution; drainage pattern; irrigation methods; water supply; water loss. [INST-WFEO00075]

0071 Institute of Oceanography and Fisheries  
Academy of Scientific Research and Technology  
101 Kasr El-Aine Street  
Cairo  
Egypt

Research on conservation and development of fisheries and water resources, including new fisheries, use and trade adapted for fish and other marine products. Topics include: establishment and development of aquaculture; collection and development of statistical information; research with technical assistance and training; management; development plans; protection of coasts against erosion. [INST-WFEO00072]

0072 The Nile Environmental Information Centre  
Academy of Scientific Research and Technology  
101 Kasr El-Aine Street  
Cairo  
Egypt

Provides bibliographic and numerical information about the Nile valley and river. Topics include: meteorological observations; hydrology and morphology of the Nile; water quality and characteristics; characteristics of the riverine ecosystems; fisheries; standards and indicators of water quality; methods for characterization of water quality; management and control of river pollution; water treatment, recycling and re-use. [INST-WFEO00073]

FRANCE

0073 Air Quality Agency (AQA)  
Information, Documentation and Training Department  
(Service Information, Formation, Documentation)  
Tour Gan  
92082 la Defense  
Paris Cédex 13  
France

Topics include: monitoring; prevention; reduction; technology transfer and assistance; techniques of prevention and reduction; pollutant impacts, measurements, diffusion, sources; legislation. [INST-WFEO00084]

0074 Association for Air Pollution Prevention (Association pour la Prévention de la Pollution Atmosphérique) (APPA)  
Documentation Centre  
62 rue de Courcelles  
75008 Paris  
France

Association for reduction of air pollution. Topics include: air

pollutants; detection, identification, monitoring, measurements, effects and interactions; health; animal protection; vegetation; legislation. [INST-WFF:000077]

**0075 Centre de Documentation sur les Déchets  
Direction de L'eau et la Prévention des Pollutions et des Risques**  
14 Bd du Général Leclerc  
92524 Neuilly-Sur-Seine  
France  
Public information centre on waste management and clean technologies in France. [INST-GUID00013]

**0076 Centre of Nuclear Studies in Saclay (Centre d'Etudes Nucléaires de Saclay)  
Documentation Department (Service de Documentation)**  
91 191 Gif s/Yvette  
France  
Topics include: nuclear energy (since 1942) and connected fields: metallurgy; physics; chemistry; radio-biology; nuclear medicine; new and renewable energy (since 1975); fossil fuels (since 1979); production of electricity (since 1979); energy conservation, storage and saving; means of production and distribution of energy; all environmental aspects of energy production (since 1979). [INST-WFF:000079]

**0077 Centre Technique Cuir Chaussure Maroquinerie (CTC)**  
4 rue Hermann Frenkel  
F-69367 Lyon Cedex 07  
France  
Centre for technical information in the leather sector with a very comprehensive library. [INST-GUID00083]

**0078 Centre Technique du Bois et de l'Ameublement (CTBA)**  
10, avenue de St. Mandé  
F-75012 Paris  
France  
Research centre specialized in the area of wood and wood products technology with experience on industrial safety, product safety and toxicity. [INST-GUID00105]

**0079 Centre Technique du Papier (CTP)**  
B.P. 7110  
F-38020 Grenoble  
France  
Research centre providing scientific and technical support to French pulp and paper companies and undertaking contractual work for them. In the industry/environment sector, has particular expertise in: effluent treatment; pollution control; environmental analysis; energy saving. [INST-GUID00121]

**0080 Centre Technique Forestier Tropical (CIRAD/CTFT)  
Centre de Coopération Internationale en Recherche Agronomique pour le Développement**  
45 avenue de la Belle Gabrielle  
F-94736 Nogent-sur-Marne  
France  
Research and information centre specializing in tropical forestry and tropical wood products with special emphasis on technology for developing countries. [INST-GUID00173]

**0081 Department of Documentation and Information on Water (Service de Documentation et d'Information sur l'Eau)  
Ministry of Environment**  
14 Boulevard du Général Leclerc  
92524 Neuilly S/Seine  
France  
Collects information on: pollution (technical, legislative and economical aspects); water quality; water pollution; waste water; waste water treatment, (including chemical); pollution source inventory and pollutant balance; monitoring results/assessments; legislation. [INST-WFF:000076]

**0082 Documentation, Research and Experimentation Centre on Hazardous Water Pollution (Centre de Documentation de Recherche et d'Experimentation sur les Pollutions Accidentelles des Eaux) (CNEXO/CFDRE)  
Centre National d'Exploration des Océans**  
COB  
B.P. 308  
29274 Brest  
France

Prepares inventories of available means for combatting water pollution in France, including: stocks; sites; characteristics of means in relation with different types of pollution; directories of means and equipment in other countries; technical use characteristics; performance; stock requirements; equipment transportation requirements. [INST-WFF:000081]

**0083 ECOTHEK**  
19 rue Daviel  
75013 Paris  
France  
Collection of information on environment to promote environmental considerations in research and public opinion. Includes environment assessment in projects for equipment, management and research. Favors unity of access to information at the local level. Topics include: climate; water; sea; air; underground; physical geography; forests; agriculture; flora and fauna; hunting and fishing; ecology; pollution; cultural heritage; management; territorial planning; urbanization. [INST-WFF:000082]

**0084 General Association of Municipal Sanitarians and Technicians (Association Générale des Hygiénistes et Techniciens Municipaux) (AGHTM)**

**Documentation Centre**

9 rue de Phalsbourg  
75017 Paris  
France

Organizes annual and monthly conferences on water and waste management and maintains international relations in this field. Topics include: solid waste; municipal waste disposal; solid waste treatment; potable water treatment and supply; waste water treatment and purification; domestic refuse, its treatment and sorting; hydrology, hydraulics; urban design. [INST-WFE:000078]

**0085 Information and Research Centre on Pollution (Centre d'Information et de Recherche sur les Nuisances) (CIRN)**

**Elf-Aquitaine**

7 rue Nelaton  
75015 Paris  
France

Collection of technical, economic and legal information for sustaining the technological activities of Elf-Aquitaine. Coordination, management and initiation of research on environment within the centres of the organization. Topics include: fuels; oil refineries; petrol production; natural gas storage; petrochemistry; de-sulphurisation; crude oil processing; purification; pollutants; air pollution; odours; noise reduction; combatting oil spills; water pollution; marine pollution; water treatment; pollution control; environmental impact; pollutant diffusion. [INST-WFE:000085]

**0086 Information Centre for Problems related to the Marine Environment (Centre d'Information pour les Problèmes de l'Environnement Marin) (CEPEM)**

141 Boulevard Saint-Germain  
75006 Paris  
France

Topics include: pollution and pollutants; oceanography; meteorology; currents; coasts and estuaries; models of air-water interactions and exchange. [INST-WFE:000083]

**0087 Institut Français de l'Energie (IFE/CITEPA)**

**Interprofessional Technical Centre of Studies on Air Pollution (Centre Interprofessionnel Technique d'Etude de la Pollution Atmosphérique)**

**Documentation Department**

3 rue Henri Heine  
75016 Paris  
France

Query service (mail, telephone or consultancy) and document collection on air pollution. Produces bibliographic synthesis and specialized reports. Topics include: technical and legislative aspects; pollution detection and reduction; pollutant

source inventory; atmospheric monitoring; air pollution measurement; emission reductions; used-air cleaning; waste-gas reduction; used air purification; industrial waste gases; gaseous air pollution; pollutant effects; pollution control technology; low impact technology; firing; meteorology; particulate removal; technical specifications; legislation. [INST-WFE:000080]

**0088 International Research Centre on Environment and Development (Centre International de Recherche sur l'Environnement et le Développement) (EHSS/CIRED)**

**Ecole des Hautes Etudes en Sciences Sociales**

Maison des Sciences de l'Homme  
54 Boulevard Raspail  
75270 Paris Cédex 06  
France

Interdisciplinary research about problems related to environment and development. Provides information for the training activities of the Centre. Topics include: technological development; resources development, management and exploitation; economic factors; growth; technical assistance; international co-operation; economic planning; environment; environmental policy; environmental R & D programmes; planning and development; limits to growth. [INST-WFE:000086]

**0089 National Bureau for Data on Oceanology (Bureau National des Données Océanologiques) (IFREMER/BNDO)**

**Institut Français de Recherche pour l'Exploitation de la Mer COB**

B.P. 337  
29273 Brest  
France

Collection and storage of oceanographic information. Manages and gives access to information through two data bases: one for conventional documentation and one for other types of data (mainly observations and measurements). Topics include: hydrology, marine currents; air-water interactions; hydro-geology; sedimentation; marine pollution; marine monitoring; marine ecology; sea floor exploration and exploitation; technological development; marine technology; instrumentation; corrosion; sites; technology; production means. [INST-WFE:000087]

**0090 National Documentation and Information Centre on Water (Centre National de Documentation et d'Information sur l'Eau) (CNDIE)**

21 rue de Madrid  
75008 Paris  
France

Provides information from various origins, about water use, conservation and treatment selected by sectoral needs. Topics include: water supply; water management; water monitoring; water pollution; water refining; sludge; waste water; liquid wastes; hydraulic engineering; biology; bacteriology; toxicology. [INST-WFE:000088]

**0091 National Documentation Centre on Wastes (Centre National de Documentation sur les Déchets)**

2 Square Lafayette  
B.P. 406  
49004 Angers  
France

Collection of information on all kinds of wastes in France, with access provided to French users. Topics include: urban, industrial, agricultural and municipal wastes; solid wastes; waste waters; re-use and recycling; natural resources management. [INST-WFE:000089]

**0092 Scientific and Technical Documentation Centre (CNRS/CDST)**

National research Centre  
26 rue Boyer  
75971 Paris Cédex 20  
France

Maintains access (through specific directories and files) to data banks and provides information services such as selective extraction and dissemination. Topics include: earth sciences; human sciences; exact sciences. [INST-WFE:000090]

**0093 Training and Documentation Centre on Industrial Environment (Centre de Formation et de Documentation sur l'Environnement Industriel (CFDE))**

Assemblée Permanente des Chambres et d'Industrie  
11 rue Léon Jouhaux  
75010 Paris  
France

Provides industrial environment information, publishes and organizes dissemination of this information through specialized directories. Topics include: training; research; technical, financial, commercial and employment, aspects; environmental impact assessment; pollutant identification, measurement, reduction and air/water interaction; solid and liquid wastes; noise; fires; explosions; hazardous waste production, treatment, transport, laws and rules. [INST-WFE:000091]

**0094 URBAMET Network (IAURIF)**

Institut d'Aménagement et d'Urbanisme de la Région Ile de France  
Secrétariat Permanent  
21-23 rue Miollis  
75732 Paris Cédex 15  
France

Topics include: urban planning; land use and rural planning; demography; habitat; lodging; architecture; urban sociology; transport economy; traffic; local financing; local authorities; city management; environment; landscape; resources management, use and protection. [INST-WFE:000092]

**0095 Water Pollution Department (Département Pollution des Eaux) (CNRS)**

Centre National de la Recherche Scientifique  
BP 1  
91710 Vert-le-Petit  
France

Research and study on water pollution and industrial waste water treatment. Topics include: characterisation of pollutant effects (waste waters and sludge) on biological processes; biotic effects of pollutants; construction of mathematical models for reduction of air pollution; water analysis; training courses on water treatment and pollution reduction; treatment plants; liquid wastes; waste gas emissions; gaseous air pollutants; water pollution; industrial waste water; radio-active trace elements; educating public opinion. [INST-WFE:000093]

GERMANY

**0096 Biochemisches Institut für Umweltcarcinogene**

Sieker Landstrasse 19  
D-2070 Ahrensburg  
Germany

Research centre specializing in detecting and measuring carcinogenic environmental pollutants in materials and products. [INST-GUID00015]

**0097 Bundesanstalt für Geowissenschaften und Rohstoffe (BGR)**

Postfach 510153  
Stilleweg 2  
D-3000 Hannover 51  
Germany

Publicly funded research centre with specialized competence in: waste disposal; radiation; water management; ground water; measuring instruments and techniques; soil and soil pollution by chemicals; recycling; vibration; environmental law. [INST-GUID00016]

**0098 Bundesforschungsanstalt fuer Getreide- und Kartoffelverarbeitung**

Schuetzenberg 12  
Postfach 1354  
D-4930 Detmold  
Germany

Research centre specializing in pesticides and heavy metals in food (grain and potatoes) products and available decontamination measures. [INST-GUID00135]

**0099 Deutsche Gesellschaft für Holzforschung**

Schwanthalerstr. 79  
D-8000 Muenchen 2  
Germany

Professional association conducting research and development on wood technology and the use of wood as building

materials, in particular: sound and thermal insulation, fire prevention; low-pollution wood preserving methods; dust and noise pollution prevention in the wood products industry; wood chemistry industry. [INST-GUID00036]

**0100 Environmental Law Information System (IUEN)**

Adenauer Allee 214  
D-5300 Bonn  
Bad Godesberg  
Nordrhein-Westfalen  
Germany

Topics include collection of national and international legislation documents, laws and regulations and standards. [INST-WFE:000094]

**0101 Fachinformationszentrum-Energie, Physik, Mathematik, GMBH (FIZ)**

Karlsruhe 7514  
Rogenstein  
Leopoldsharven 2  
Germany

Research and technology regarding energy sources. Topics include: fossil fuel; production and distribution of electricity; nuclear energy; renewable energy; synthetic energy sources; energy conservation, consumption and use; conversion; storage; policy; management; economy; biological aspects; health; safety; nuclear physics; chemistry; materials; earth sciences. [INST-WFE:000095]

**0102 Federal Institute for Geosciences and Natural Resources (BGR)**

Stilleweg 2  
P.O. Box 510153  
3000 Hannover 51  
Germany

Topics include: technology and environment. Manages HYDROLINE (hydrology; provisions; water management; water resources quality and management; economic assessment; hydraulic engineering; soil physics; drainage; irrigation; rural equipment and development) and MARINELINE (marine technology; off-shore techniques and equipment; energy; desalination; geo-sciences; exploitation technology; measurements; navigation; building materials; environment protection; monitoring and measurements; hazard prevention; legislation about seas). [INST-WFE:000096]

**0103 Federal Institute for Materials Research and Testing (Bundesanstalt für Materialforschung und -prüfung) (BAM)**

Unter den Eichen 87  
D-1000 Berlin 45  
Germany

Federal research and test centre which carries out (mostly as contractual work) materials testing and research. Consists of a large number of departments and sub-departments with

specialized competence in: metallurgy; building materials; plastics; textiles; leather; industrial safety engineering; wood technology; transport of hazardous goods; fire prevention; noise. Has a major publications programme, including seven journals. [INST-GUID00007]

**0104 Fichtner GmbH & Co. KG**

**Business Development**  
Sarweystrasse 3  
P.O. Box 10 14 54  
D-7000 Stuttgart 1  
Germany

Consulting firm specializing in the energy sector, in particular: energy conservation; environmental effects of energy conversion; energy saving; environmental technology; solar energy and wind energy. [INST-GUID00195]

**0105 Forschungsvereinigung Automobiltechnik**

Westendstrasse 61  
D-6000 Frankfurt-am-Main  
Germany

Organization promoting research on the environmental effects of exhaust gases from automobiles and on recycling of materials used in vehicle manufacture. [INST-GUID00148]

**0106 Fraunhofer-Institut für Umweltchemie und Ökotoxikologie**

P.O. Box 1260  
Grafschaft  
D-5948 Schmallenberg  
Germany

Research centre specializing in assessing the environmental effects of agro-chemicals and other chemical products, through trace analysis in air, soil, water, plants and animals. Topics include: development and improvement of methods for testing; exposure and effects analysis using environmental modelling and structure activity relationships; bio-statistics; exposure minimization and protection; decontamination of soils; surface water treatment. [INST-GUID00104]

**0107 Gesellschaft fuer Strahlen- und Umweltforschung, Institut fuer Oekologische Chemie**

Ingolstaedter Landstrasse 1  
D-8042 Neuherberg  
Germany

Research centre specializing in eco-toxicological profile analysis and assessment of chemicals. Topics include: studies of chemicals in organisms, ecosystems and food technology; studies of chemicals under simulated conditions; dispersion studies and optimization of analytical methods for air pollution, water pollution and soil pollution; air monitoring in the work place. [INST-GUID00137]

**0108 Goeppfert, Reimer & Partner**

Bramfelderstrasse 70



D-2000 Hamburg 50  
Germany

Consulting firm offering services related to the design of: municipal and hazardous waste incineration plants; thermal sewage treatment facilities; flue gas scrubbing systems; heat exchangers in the flue gas system of waste incineration plants. [INST-GUID00213]

**0109 Hessische Landesanstalt für Umwelt**  
Unter den Eichen 7  
D-6200 Wiesbaden  
Germany

Government institution and research centre for the environment with special concentration on waste management, recycling and waste utilization, air pollution and ground water recharge. Includes specialized departments on noise, air pollution, waste management, water protection, environmental planning, environmental analysis and environmental information. [INST-GUID00100]

**0110 Hygiene-Institute des Ruhrgebiets**  
Rotthäuser Strasse 19  
D-4650 Gelsenkirchen  
Germany

Research institute concentrating on water management. Topics include: technology for water treatment and analysis relating to water supply, swimming pools, surface, river and ground water, waste water and domestic and industrial wastes. [INST-GUID00052]

**0111 Institute für Meeresgeologie und Meeresbiologie Senkenberg**  
Schleusenstr. 39 A  
D-2940 Wilhelmshaven  
Germany

Research institute exploring the application of remote sensing methods to environmental protection. Specific research on: the impact of industrial marine pollution on the ecosystem in the Jade Area; heavy metals in sediments of the German Shelf Area; fauna fluctuations at Norderney Island. [INST-GUID00050]

**0112 Kernforschungszentrum Karlsruhe**  
Institut für Radiochemie  
Abteilung Wassertechnologie  
Kernforschungszentrum  
D-7500 Karlsruhe  
Germany

Research centre with expertise in: water contamination and pollution control; water chemistry and treatment; nitrate removal and recycling of phosphate. [INST-GUID00028]

**0113 Lurgi GmbH**  
P.O. Box 111231  
Lurgi Allee 5

D-6000 Frankfurt-am-Main  
Germany

Consulting firm offering services in industrial technology. Has a specialized energy and environmental technology division with competence in: waste water and waste management technology; air pollution control systems; coal and energy technology. [INST-GUID00190]

**0114 Stiftung Limnologische Arbeitsgruppe Dr. Seidel**  
Am Waldwinkel 70  
D-4150 Krefeld 29  
Germany

Organization carrying out research and analysis and advising on treatment of sewage and waste. Topics include: food industry; iron and steel industry; pulp and paper industry; advice on the location of sewage disposal plants and on waste water treatment; biodegradation. [INST-GUID00040]

**0115 Technische Hochschule Darmstadt Institut für Papierfabrikation**  
Abteilung für Umweltforschung  
Alexanderstr. 8  
D-6100 Darmstadt  
Germany

Technological institute with specialized competence in: recycling of waste paper; paper production in closed systems without waste water; waste utilization of ashes from paper industry sludge; degradation of organic process materials for paper production. [INST-GUID00035]

**0116 Tuev Bayern Holding GmbH**  
Westernstrasse 199  
D-8000 Muenchen 21  
Germany

Independent inspection and consulting organization, acting as a technical inspection body for most sectors of society. Maintains laboratory and research centre and undertakes consulting work. Tuev Bayern has specialized competence in a number of environment sectors, co-ordinated under a "man and environment" department: air pollution; water pollution; soil pollution; noise pollution; waste management. [INST-GUID00175]

**0117 Umweltbundesamt**  
Bismarckplatz 1  
D-1000 Berlin 33  
Germany

Information and documentation system on environment in Germany (UMPIIS). Collects and disseminates information on environmental matters and stores data in various data bases for information and research purposes. Provides advice and assistance for regional ecological planning. Topics include: natural resources; water, air and soil; noise; nature conservation and sites preservation; environment-

development relationships; economic aspects; training and public information; ecology; regional planning. [INST-WFEO00097]

**0118 Universität Karlsruhe  
Engler-Bunte Institut  
Bereich Gas, Erdöl und Kohle  
Richard-Willstätter-Allee 5  
D-7500 Karlsruhe  
Germany**

Desulphurization of gas, liquid and solid fuels; mass-spectrometric investigation into the content of polycyclic aromatic compounds in fuels and exhaust gases. [INST-GUID00021]

**0119 Untersuchungsstelle für Umwelttoxikologie  
Schleswig-Holstein  
Fleckenstr.  
D-2300 Kiel  
Germany**

Research centre engaged in toxicological data collecting and data processing relevant to environmental pollution in Schleswig-Holstein. [INST-GUID00107]

**GHANA**

**0120 Cocoa Research Institute  
P.O. Box 8  
Tafo-Akim  
Ghana**

Research centre specializing in the production problems of the cocoa industry. Provides technical information and advice to user-organizations concerned with cocoa pre-harvest problems. Also undertakes studies on coffee, cola and shea nuts. [INST-GUID00181]

**0121 Technology Consultancy Centre (UST/TCC)  
University of Science and Technology  
Kumasi  
Ghana**

Collection and dissemination of technical information. Topics include: training; supply of technical and development assistance; pilot studies; agricultural methods; appropriate technology; pesticides, herbicides and weed control agents; soaps and detergents; selective breeding of animals; utilization of local resources; technology transfer. Promotes grass roots development by means of intermediate or appropriate technology. [INST-WFEO00098]

**GREECE**

**0122 Greek Productivity Centre  
Athens  
Greece**

Technical institute in charge of collection/dissemination of information about economy, territorial and economic planning, research in technology, industry and related matters (ELKEPA). Topics include: training activities and organization of seminars and courses for industrial societies; organizes, summarizes and analyses information needed for industrial activities. [INST-WFEO00099]

**0123 Technical Chamber of Greece  
Environmental Unit  
Library**

Lekka 23-25  
105 62 Athens  
Greece

Dissemination of information about pollution levels (especially in air), prevention and reduction technologies as well as means for combatting air pollution. Provides technical assistance and training courses. Topics include: characteristics, measurements, monitoring, reduction, sources and interaction; health aspects; toxicity; legislation for environment; high-atmosphere pollution; climatology and meteorology; technology transfer; traffic and transport. [INST-WFEO00100]

**GUATEMALA**

**0124 Ciudad Universitaria (CIERIS)  
Facultad de Ingeniería  
Centro de Información de ERIS**

C Zona 12  
Ciudad de Guatemala  
Guatemala

Information, research, education and training. Topics include: solid wastes; urban waste collection, treatment and destruction; public health; diseases related to water pollutants; water pollution; waste waters collection; sewage patterns; water regulation systems; water quality; waste water treatment and purification. [INST-WFEO00101]

**0125 División Documentación e Información de ICAITI  
(ICAITI)**

Oficina 10 1er piso  
Ed Registro de la propiedad  
9A Avda entre 14 y 1  
Zona 1 Ciudad de Guatemala  
Guatemala

Provision of information to the public, training centres and industrial societies involved in environmental matters. Topics include: research; standards and standardization; technical assistance; technology transfer; chemical treatment of waste; drinking water treatment; sewage; industrial effluents; plastic and polymer wastes; sanitary landfill and tipping; waste recovery; eutrophica-

tion; inorganic pollutants; long-term effect of pollutants; organic pollutants; pollutant analysis, monitoring, effects; pollutant source identification; pollution control regulations and technology. [INST-WFEO00102]

**HUNGARY**

**0126 Hungarian Central Technical Library and Documentation Centre (OMKDK)**

P.O. Box 12  
H-1428 Budapest  
Reviczky U 6  
Hungary

National centre for scientific and technical information. Provides the government and all administrative offices and organizations with information relevant to their activities including environmental matters from all possible aspects and for all possible objectives. [INST-WFEO00104]

**0127 Institute for Environmental Protection (OKTH)  
National Authority for Environmental Protection and Nature Conservation**

P.O. Box 732  
H-1531 Budapest  
Hungary

Collection and dissemination of information about environment and national natural resources. Topics include: data on the state of the environment (numerical data); teaching and training activities; standardization; air and water pollution and quality; gaseous pollution; noise (aircraft, industry, transportation means); abatement and measurement; environmental statistics; equipment for measurement, control, monitoring and sampling; methods and technology; solid wastes; urban, industrial and agricultural effluents; toxic substances; environmental hazards. [INST-WFEO00105]

**0128 Research Centre for Water Resources Development (VITUKI)  
Information Centre**

Pf 27  
H-1453 Budapest 92  
Hungary

Research on water management. Topics include: water stages; discharge measurements; sediment transport; water table; surface and underground water quality; sources of pollutants; reduction, control, monitoring of water pollution; used water; treatment. [INST-WFEO00103]

**0129 State Authority for Energy Management and Safety  
Energy Planning Department**

Koeztarsasag ter 7  
H-1081 Budapest  
Hungary

Government agency, responsible for information process-

ing and collection on national energy consumption, preparing evaluations and recommendations as a basis for decision-making. Publishes periodicals and supplies information related to its field of interest. [INST-GUID00182]

**INDIA**

**0130 Ahmedabad Textile Industry's Research Association (ATIRA)**

**Library and Information Services**  
Post Polytechnic  
Ahmedabad 380015  
Gujarat  
India

Research centre specializing in textile quality improvement, product substitution, appropriate technology, low waste extraction and waste utilization. [INST-GUID00132]

**0131 Atul Consultants Private Limited**

A-7 Pushpanjali Enclave  
New Delhi 110034  
India

Consultant firm offering general engineering services, including environmental technology and engineering related to pollution control and effluent treatment. [INST-GUID00216]

**0132 Bhilai Steel Plant**

**Environmental Management Department**  
Ispat Bhavan  
Bhilai Nagar 490001  
Madhya Pradesh  
India

State owned steel industry, paying special attention to factory and surroundings. Established in green belt, incorporating township with amenities, housing, water supply, sewage disposal. [INST-GUID00208]

**0133 Birla Research Institute for Applied Science**

Birlagram  
Nagda 456331  
Madhya Pradesh  
India

Research centre engaged in process development for air and water pollution control, particularly in connection with rayon production and pulp mills, as well as utilization of cellulosic waste from rayon plants. [INST-GUID00019]

**0134 Bombay Textile Research Association**

I. B Shastri Marg  
Bombay 400086  
Maharashtra  
India

Research centre with laboratory and pilot plant undertaking and sponsoring research projects relevant to the textile

industry. In the environmental sector, activities include research on textile effluent treatment and reduction and related water management and conservation measures. [INST-GUID00174]

**0135 Central Inland Capture Fisheries Research Institute**

Barrackpore 743101

West Bengal

India

Research centre studying fresh water ecology in relation to fisheries exploitation and management. In the industry/environment sector. Topics include estuarine pollution, in particular environmental effects of industrial waste water discharge, pesticides and heavy metal pollution. Conducts information and training programmes in inland fisheries. [INST-GUID00114]

**0136 Central Institute of Fisheries Technology**

Ministry of Agriculture

Department of Agricultural Research and Education

Willingdon Island

Cochin 682029

Kerala

India

Research centre working to develop improved fishery technology, optimum catch and waste utilization as well as to popularize results of research in this field. [INST-GUID00162]

**0137 Environmental Information Systems (ENVIS)**

Department of the Environment

BI Kaner House

Shahjahan Road

New Delhi 110011

India

Helps national and regional development projects by introducing environmental considerations. Provides scientific and technical information about environment. Topics include: environmental impact assessment; teaching and training in environmental matters; research or equipment projects with technical assistance; flora and fauna; human settlements; nature conservation; development planning; territorial planning; economic aspects of regional development; legislation; environmental policy; pollution control regulations; scientific and technical information; technical assistance; pollution monitoring, measurement, reduction, control and identification. [INST-WFTE:000106]

**0138 Gujarat State Fertilizers Co. Ltd.**

Research Development Center

P O Fertilizernagar

Baroda 39150

Gujarat

India

Commercial company carrying out research and developing

water treatment systems and other methods for control of air pollution and water pollution. Also carries out studies on the environmental effects of air pollutants from the fertilizer industry and of solid and liquid waste utilization. [INST-GUID00023]

**0139 Haffkine Institute for Training, Research and Testing (Pharmaceuticals)**

Parli

Bombay 400012

Maharashtra

India

Research and development, training and testing for pharmaceutical products, biological materials, water, disinfectants, food samples, pesticides, cosmetics, chemicals and plastics. Also has expertise on bio-availability of drugs and environmental health with regard to air pollution and water pollution. [INST-GUID00126]

**0140 Harcourt Butler Technological Institute**

Chemical Engineering Department

Kanpur 208002

Uttar Pradesh

India

Research institute carrying out fundamental and applied research on coal, in particular gasification, coal liquefaction and pollution control. [INST-GUID00009]

**0141 Indian Agri Research Institute**

Division of Agricultural Chemicals

Pusa

New Delhi 110012

India

Research centre, specializing in all aspects of agricultural chemicals. [INST-GUID00185]

**0142 Indian Association for Water Pollution Control**

c/o Neeri

Nehru Mag

Nagpur 440020

Maharashtra

India

Provides members of the association with information about technology and policy related to water pollution control. Contributes to the development of water pollution reducing equipment. Topics include: drinking water and its treatment; water pollution; water quality; water treatment and purification; pollution control regulations; pollution control technology; pollution risks. [INST-WFTE:000107]

**0143 Indian Institute of Technology**

Centre of Energy Studies

Hauz Khas

New Delhi 110029

India

Research centre co-ordinating energy research activities, including: electric power systems; liquefied fuel; chemical feedstock from low-grade coal; biomass energy resource development; solar energy utilization; laser-induced fusion; unconventional synthetic fuel utilization. Offers degree and short-term courses. [INST-GUID00090]

**0144 Indofil Chemicals Ltd.**

Nirlon House  
Dr. Annie Besant Road  
P.O. Prabhadevi  
Bombay 400025  
Maharashtra  
India

Commercial firm engaged in production and marketing of pesticides and industrial chemicals. Has environmental competence in effluent treatment relating to pesticide formulation plants and industrial chemical manufacturing plants. [INST-GUID00049]

**0145 Industrial Effluents and Environmental Pollution Control Division**

General Directorate of Technical Development  
Udyog Bhavan  
New Delhi 110001  
India

Helps to define policies of control and management in the field of industrial wastes (liquid, gaseous, solid), technology transfer and supply of technical and development assistance. Topics include: air and water quality control; impact assessment; pollutant sources, reduction and control technology; technological aspects; regulations, rules and laws; standards; public health; toxicity of pollutants; solid wastes management, re-use and destruction. [INST-WFE000108]

**0146 Industrial Toxicology Research Centre**

Mahatma Gandhi Marg  
P.O. Box 80  
Lucknow, 226001  
Uttar Pradesh  
India

Research centre studying industrial toxicological hazards, including environmental effects of industrial toxins in agriculture, mining and industry. Undertakes safety evaluation of chemicals. [INST-GUID000004]

**0147 Jute Technological Research Laboratories**

12, Regent Park  
Calcutta 700040  
West Bengal  
India

Research centre specializing in technology aspects of jute and allied fibre plants and related waste utilization and waste minimization. [INST-GUID00186]

**0148 M/S Travancore Titanium Products Ltd.**

Trivandrum 695021  
Kerala  
India

Commercial firm producing titanium dioxide by sulphate process. Has expertise in air pollution control utilizing bag filters and electrostatic precipitators, as well as effluent treatment handling dilute acid, ferrous sulphate, sulfates of vanadium, chromium and titanium. [INST-GUID00024]

**0149 National Environmental Engineering Research Institute (NEERI)**

Nehru Marg  
Nagpur 440020  
Maharashtra  
India

Research, development and consulting in the field of environment. Topics include: collection and dissemination of information about environmental problems and characteristics; technology transfer; municipal wastes; recycling of waste; sewage; septic tanks; sewage treatment systems; water pollution; pollution control regulations; pollution monitoring; urban wastes; recycling of waste; water treatment; soil contamination; pollutant levels. [INST-WFE000109]

**0150 National Institute Foundry & Forge Technology**

P O Hatia  
Ranchi 834003  
Bihar  
India

Research centre specialized in applied industrial research, non-destructive testing and statistical quality control within the foundry and forge sector and offering training to engineers in industry. [INST-GUID00098]

**0151 National Productivity Council**

Technology Services  
Institutional Area  
Lodi Road  
New Delhi 110003  
India

Government agency providing consulting services to industry on i.e. pollution control. Undertakes macro-level studies on environmental management and conducts national and international seminars and training programmes. [INST-GUID00183]

**0152 Pesticides India Ltd.**

Production and Planning  
Udaisagar Road  
Udaipur 313001  
Rajasthan  
India

Topics include: research on pest control; pollution control

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regulations; waste conversion techniques; pesticides and insecticides; interaction of pesticides; metabolism of pesticides; toxicity; control standards; management; development assistance; technical assistance; research; commercial production; marketing distribution; technology transfer. [INST-GUID00221]

### 0153 Regional Research Laboratory, Jorhat

Jorhat 785006  
Assam  
India

Research laboratory undertaking environmental research particularly relevant to the north-eastern region of India. [INST-GUID00131]

### 0154 Society for Clean Environment

Garden Resort  
Sion Trombay Road  
Bombay 400071  
Maharashtra  
India

Provides information to the public and collects data about the state and quality of environment including analysis and interpretation of results. Takes part in fundamental and applied research in the field on environmental quality and control. Supplies researchers and industrial societies with technical assistance. Topics include: air, water and soil quality monitoring; measurements and control. Identification of pollutants; measurements (rain, snow, soil); sampling methods; environmental impact assessment; impacts on human health; solid wastes. [INST-WFE:000110]

### 0155 Steam Boilers & Smoke Nuisances, Maharashtra State

Commerce Centre  
Tardeo Road  
Bombay, 400034  
Maharashtra  
India

Government agency responsible for pollution control in connection with approval and inspection of industrial furnaces and chimneys. [INST-GUID00018]

### 0156 TATA Energy Research Institute (TERI)

7, Jor Bagh  
New Delhi-110003  
India

Research centre concentrating on the energy sector, and on other fields such as biotechnology, forestry and agriculture as they relate to energy production and energy conservation. Maintains an information centre and has a number of publications. An energy and environment data base is under development. [INST-GUID00161]

### 0157 The Arvind Mills Ltd. Research and Development

Post Box No.56  
Naroda Road  
Ahmedabad 380025  
Gujarat  
India

Textile factory maintaining a research and information centre with pilot plant. [INST-GUID00006]

## INDONESIA

### 0158 Centre for Environmental Studies (Pusat Studi Ilmu Lingkungan)

Documentation Centre  
Salemba 4  
Jakarta  
Indonesia

Research, training, education and public service in the field of environment. Collection, production and dissemination of technical and fundamental information about environment. [INST-WFE:000111]

## IRELAND

### 0159 Agricultural Institute Information Centre

19 Snadymount Avenue  
Ballsbridge  
Dublin 4  
Ireland

Reviews, co-ordinates, promotes and undertakes agricultural research, including horticulture, forestry and bee keeping. Topics include: horticulture; forestry; soil science; agricultural economics; agricultural engineering; agro-industry; food; agricultural wastes; herbicides; pesticides; residue analysis; pollutant effects on agriculture. [INST-WFE:000112]

### 0160 Institute for Industrial Research and Standards

Ballymun Road  
Dublin 9  
Ireland

Promotes the application of science and technology and information services to Irish industry. Topics include: air quality; emissions; industrial wastes; water pollution; water quality; standards; industrial noise; waste assimilation capacities; treatment plants. [INST-WFE:000113]

## ISRAEL

### 0161 Analyst Ltd.

P.O.B. 1176  
Rehovot Kiryat Weizmann 76111  
Israel

Commercial firm undertaking analysis of residues from pesticides and heavy metals contamination and toxic substances in fruit. [INST-GUID00119]

**0162 Environmental Engineering Research Centre**

Israel Institute of Technology  
Faculty of Agricultural Engineering  
Technion City  
Haifa 32000  
Israel

Applied research in environment especially in relation to agriculture and land use. Topics include: soil quality; soil reconversion; agricultural planning; natural resources management; water supply; water quality control; water losses; pollutant identification, measurement and reduction; waste collection, treatment, recycling and re-use; solar energy; combination solar energy/waste water treatment/algal production; biomass/bioconversion. [INST-WFEO00114]

**0163 Environmental Protection Service**

P.O.Box 6158  
Jerusalem 91061  
Israel

Governmental service organized in several specialized divisions, in charge of promoting environment in all economic activity sectors (production, services, agriculture, tourism, industry, training, territory planning, city management, economy, transport). Topics include: air and water quality, control and monitoring; water treatment and purification; reduction of pollution; pollutants' characteristics; solid and liquid wastes and gaseous emissions; recycling, re-use and destruction; renewable energy; biomass/bioconversion; landscape; natural site preservation and management; urban and rural areas management; legislation and regulations; rules and laws; standards; education; training. [INST-WFEO00115]

**0164 Israel Desalination Engineering (IDE)**

P.O. Box 591  
Raanana 43104  
Israel

Consulting firm dealing with: industrial and domestic waste water and effluent treatment; recycling and reuse; biomass energy; bio-environmental engineering; computer modelling of bio-environmental processes; product recovery. [INST-GUID00214]

**0165 Oil Refineries Ltd.**

Library  
P.O. Box 4  
Haifa 31000  
Israel

Information centre supplying technical information on: petroleum refinery design; electric power generation; transportation; air, water and soil conservation. [INST-GUID00167]

**JAMAICA**

**0166 Natural Resources Conservation Department (NRCD)**

Ministry of Environment, Science and Technology  
P.O. Box 305  
531/2 Moynes Road  
Kingston 10  
Jamaica

Research, training, public education and information on the state of environment in Jamaica and its evolution (monitoring sites). Topics include: national and international legislation and regulations regarding nature conservation; development control; natural resources preservation; sustainable development; environmental impact assessment; environmental standards; natural resource management; industrial pollutants; continental and marine water pollution; watersheds and slopes conservation; ecology of soils, fauna, flora, ocean; natural sites conservation. [INST-WFEO00116]

**JAPAN**

**0167 Clean Japan Center**

Foreign Affairs Department  
No.2 Akiyama Bldg.  
3-chome 6-2 Toranomon  
Minato-ku  
Tokyo 105  
Japan

Information centre promoting waste management and recycling. Conducts research and experiments to develop recycling techniques and collects related technical information. The centre manages a data bank on waste disposal and resource recycling and provides reference services. [INST-GUID00032]

**0168 Environment Agency**

Information Centre  
1-2-2 Kasumigaseki  
Chiyoda-Ku  
Tokyo 100  
Japan

Governmental service organized in several divisions, covering specific aspects of environmental protection and management and information. Also in charge of R & D projects (including international) and of training and teaching programmes oriented toward management and control of the environment, as well as toward relevant technology. Topics include: air quality; air pollution; control and measurements of pollutants; monitoring sites; management and planning of environment; nature conservation; natural sites management; health; specific diseases; chemicals; herbicides; pesticides; water quality; water pollution; control and measurement of pollutants in water; water supply. [INST-WFEO00121]

**0169 Environmental Engineering Department**  
**Kitami Institute of Technology**  
 Kitami-Shi  
 Hokkaido 090  
 Japan

Research, training and education in the field of environment engineering. Topics include: chemical analysis; chemical engineering; chemistry; coal, gas and coke; mercury; physico-chemical processes; pollutant analysis; soil contamination; water pollution. [INST-WFF:000117]

**0170 Environmental Pollution Research Centre**  
 6-3; Shimizu 3-Chome  
 Miyazaki-Shi  
 Miyazaki 880  
 Japan

Research and monitoring of pollutants and pollution of natural resources. Numerical data collection (from monitoring sites), storage and dissemination. Topics include: air pollution; gaseous air pollutants; noise; odour nuisance; vibration; water pollution; water quality; training. [INST-WFF:000118]

**0171 Geological Survey of Japan (MITI/GSJ)**  
**Ministry of International Trade and Industry**  
 1-1-3 Higashi  
 Yatabe  
 Tsukuba  
 Ibaragi 305  
 Japan

Geological and technological research in the field of environment protection (including international co-operation). Topics include: environmental geology and geological hazards; energy and mineral resources; geophysics; geochemistry; earthquakes; volcanic eruptions; magnetic survey; geological investigation of deep sea and continental shelves; deep geothermy resources; technology for environment protection. [INST-WFF:000120]

**0172 Japan Information Centre of Science and Technology (JICST)**  
 5-2 Nagatacho 2-Chome  
 Chiyoda-Ku  
 Tokyo 100  
 Japan

Collects, stores and disseminates comprehensive, world-wide scientific and technological information. Abstracts current periodical titles and publishes abstract journals. Covers scientific and technical information of all kind, collected from Japanese sources including research centres. [INST-WFF:000122]

**0173 Kawasaki Municipal Research Institute for Environmental Protection**  
 Tajima-Cho 20-2

Kawasaki-Ku  
 Kawasaki-Shi  
 Kanagawa 210  
 Japan

Involved in urban management research including standardization activities for Japanese city environments. Topics include: air pollution; air quality; noise; vibration; water pollution; water quality. [INST-WFF:000123]

**6174 National Institute for Environmental Studies**  
**Environmental Information Division**  
 16-2 Onogawa  
 Yatabe  
 Tsukuba-Gun  
 Ibaraki 305  
 Japan

Collection and dissemination of information received from specialized divisions in the Institute. Topics include: acid rain; aerosols; atmospheric chemistry and composition; atmospheric models; climatic change and variability; photo-chemical agents and effects; ozone; meteorology; health; pollutants; human physiology and pathology; immunology; long-term effects of pollutants; medical treatment and health care; nitrogen oxides; ozone; pollution criteria; epidemiology; toxicology; chemical analysis; heavy metals; identification of pollutants; international standards; sampling methods; soaps and detergents; toxic substances; soil contamination; agricultural engineering; automatic control mechanisms; chemical engineering; ecological monitoring; gaseous air pollutants; technical developments; biology; water pollution and water quality. [INST-WFF:000119]

**0175 Osaka City Institute of Public Health & Environmental Sciences**  
**Research Planning and Coordination Department**  
 8-34 Tohojo-Cho  
 Tennoji-Ku  
 Osaka 543  
 Japan

Research centre providing services and technical information on pollution control technology, environmental health, food hygiene and toxicology. [INST-GUID00112]

KENYA

**0176 International Centre for Industry and Environment (ICIE)**  
 P.O. Box 30643  
 Nairobi  
 78100 Kenya

Supplies information about environment for research and development projects (i.e. environmental impact assessment; appropriate technology), within international co-operative projects and framework. Topics include: atmospheric models; atmospheric monitoring; chemical and related industries; ap-



appropriate technology; environmental management and planning; food processing industries; mineral extraction and processing; pulp, paper and board industry; waste management, recycling and treatment; toxicological testing; siting of industry; technological development. [INST-WFEO00124]

**KUWAIT**

**0177 Environmental Protection Centre**

**Kuwait Shoolba Authority**

P.O. Box 4690

Safat

Kuwait

Collects information about the state of the environment and the effects of human activities on natural resource quality and quantity. Topics include: development assistance; environmental policy; collection of statistical data; air and water quality and pollution; liquid and solid wastes production, management, treatment and recycling; environmental monitoring through measurements, control and data collection; continental and marine hydrology; atmosphere; soils; health protection; pollutant related diseases; waste water purification and reuse. [INST-WFEO00125]

**0178 National Scientific and Technical Information Centre ( NSTIC)**

P.O. Box 24885

Safat

Kuwait

National information and research centre for applied research and development, technology transfer and training in science and technology. Topics include: solar energy; oil-related environmental impact; marine water quality; desalination; agriculture; irrigation; water supply, use and losses; technology transfer; marine technology; nutrients; pollution control, measurements, monitoring and standards. [INST-WFEO00126]

**LIBYAN ARAB JAMAHIRIYA**

**0179 Arab Development Institute**

P.O. Box 8004

Tripoli

Libyan Arab Jamahiriya

Topics include: natural resources management and development; water management; water supply and use; solar energy and other sources of renewable energy; oil impacts on environment; air pollution; marine pollution; wastes; water pollution. [INST-WFEO00127]

**MALAYSIA**

**0180 Environmental Protection Society of Malaysia (Persatuan Perlindungan Alam Sekitar Malaysia) (EPSM)**

P.O. Box 382

Jin Sultan

Petaling

Jaya

Malaysia

Collects information about environmental protection in developing countries. Selects, trains and sends volunteer workers to Asian countries. Topics include: rural management; natural resources conservation; pollution control; agriculture; irrigation; agricultural means and inputs; environmental effects; sociological effects; human health; rural economics; biomass/bioconversion; energy conservation; hydroelectricity; solar energy; wind. [INST-WFEO00128]

**MALTA**

**0181 Malta Human Environmental Council Library Ministry of Health**

15 Merchant Street

Valletta

Malta

Collects and disseminates data on health and pollution through monitoring and control. Coordinates activities related to environmental protection and participates in development projects concerning the Maltese islands and their management. Topics include: pollution control; ecological monitoring; potable water; waste dumping/incineration; sea pollution; occupational disease and contamination; toxicology; epidemiology; development and management of coastal areas. [INST-WFEO00129]

**0182 Mediterranean Technical Services Limited Technical Library**

1 Valley Mansions

Valley Road

B'Kara

Malta

Provides advice and supplies technical information. Topics include: industry and appropriate technology; standards; patents; air cleaning; water pollution and treatment; water supply use and treatment; sewage treatment and systems; sound insulation and acoustics; telecommunications. [INST-WFEO00130]

**MAURITIUS**

**0183 Mauritius Sugar Industry Research Institute**

Reduit

Mauritius

Research centre covering most sectors of sugar production, including environmental aspects. Maintains scientific information service and library. [INST-GUID00095]

MEXICO

**0184 Centro de Información Científica y Humanística (UNAM/CICIH)**

Universidad Nacional Autónoma de México  
Ciudad Universitaria  
Apartado Postal 70-392  
México D.F. CP 04510  
México

Collects and disseminates information on science and technology, including processes. [INST-WFEO00131]

**0185 Centro Mexicano de Información Química (IASFICEMIQ)**

Laboratorios Nacionales de Fomento Industrial  
Apartado Postal 41-537  
Avenida Industria Militar 261  
11200 México D.F.  
México

Supplies information about chemicals to industry, including market studies, patents and project evaluation. Topics include: chemical analysis and biotechnology; food industry; pulp and paper industry; environment and pollution control; machinery and equipment; environmental impact assessment. [INST-WFEO00132]

**0186 Innovación-Información-Tecnología (INFOTEC)**

Apartado Postal 19-194  
03910 México D.F.  
México

Provides information analysis. Topics include: metalworking industry; electrical industry and electrical engineering; chemical industry and pharmaceuticals; food industry and contamination; ceramics and glass; management; standards; patents, legislation. [INST-WFEO00133]

**0187 Instituto de Ingeniería (UNAM/II)**

Universidad Nacional Autónoma de México  
Apartado Postal 70-472  
Circuito Interior  
Ciudad Universitaria  
04510 Coyoacán  
México D.F.  
México

Research, education and training centre. Topics include: automation; instrumentation; construction industry and building materials, engineering; hydraulics; geo-technics; environment; soil mechanics; fluid mechanics; energy transfer; process study of active sludge in sewage treatment; seismology and seismic behaviour of rocks, dams, railways and roads. [INST-WFEO00134]

**0188 Servicio de Consulta a Bancos de Información (SECOBI)**

Consejo Nacional de Ciencia y Tecnología  
Circuito Cultural Universitario  
Edif A Planta Baja  
CP 04515 México D.F.  
México

Provides access to national and international data bases and collects and disseminates information on information systems. Topics include: research on pollution (water, air, soil, solid wastes); clean technology; control techniques; elaboration of programmes related to waste management and pollution control; potable water; water treatment; wastes treatment; sludge treatment and management; legislation; laws; statistics; human health. [INST-WFEO00135]

MOROCCO

**0189 Centre National de Documentation (CND)**

Chari Maa Al Aizain  
Haut Agdal  
B.P. 826  
Rabat  
Morocco

Collection, storage and dissemination of information to the public. Topics include: animal physiology; botany; geology; soil conservation; consumer goods; demographic trends; economics; human diseases; medical treatment and health care; forests (afforestation and reforestation); genetic resources conservation; forestry; forest products; wild fauna; pastures; agricultural wastes; watersheds; dams; soil use; bacteriology; zoology; virology; entomology; pesticides; ecosystems; fisheries; marine ecosystems; aquaculture; pollutant effects; marine pollution; waste recycling; monitoring and control equipment. [INST-WFEO00136]

NETHERLANDS

**0190 Central Organization for Research in the Applied Sciences (TNO-IMG)**

Postbus 214  
2600 AE Delft  
Netherlands

Conducts research and provides information in relation to environmental factors and health. Looks for technical solutions to problems relating to the maintenance of a healthy environment. Topics include: health protection; industrial and domestic hygiene; toxicology; environmental technology; air pollution; soil protection; gaseous air pollutants; water pollution; surface and ground water; sludge treatment, sewage; insulation; thermal insulation; analysis; energy saving; measuring methods; monitoring. [INST-WFEO00137]

**0191 Centre for Agricultural Publishing and Documentation (PUDOC)**

Postbus 4  
6700 AA Wageningen  
Netherlands

Compiles and disseminates information and documentation on: agriculture; forestry; land use; environmental management; nature protection; ecology; flora and fauna; wildlife management; air, water and soil pollution; toxicity of chemical substances; open space planning; soil use; landscape protection; recreational facilities; ecosystems; fertilizers; pesticides; water supply. [INST-WFE:000138]

**0192 Consultants on Environmental Technology VHB**

Graafsehaan 13  
P.O. Box 2  
NL-5248 BB Rosmalen  
Netherlands

Consulting firm specialized in environmental engineering in connection with road construction, water engineering, building materials and pipelines. Has developed a soil washing plant and is engaged in research on recycling waste materials for road construction. [INST-GUID00056]

**0193 DSM Research Ltd.**

Environment Safety Research Department (130-MUR)  
P.O. Box 18  
6160 MD Geleen  
Netherlands

Research centre (specialized division of a chemical plant) with responsibility for environmental and industrial safety research. [INST-GUID00053]

**0194 Foundation for Applied Ecology**

2 Oorgot  
Edam  
Netherlands

Conducts applied research on environment in relation to development and consumption. [INST-WFE:000139]

**0195 Hoogovens Group B.V. - IJmuiden**

Kesslerplein 1  
1970 CA IJmuiden  
Netherlands

Steel industry with a specialized department for pollution monitoring and control. [INST-GUID00054]

**0196 Industrial Products and Services TNO**

Fibre Research Institute  
Schoemakerstraat 97  
P.O. Box 110  
NL-2600 AC Delft  
Netherlands

Research centre active in the textile and paper sector, with special competence in water management, effluent treatment and in recycling of paper and board. [INST-GUID00055]

**0197 Institute for Storage and Processing of Agricultural Products**

P.O. Box 18  
6700 AA Wageningen  
Netherlands

Research institute specialized in research on storage and processing of agricultural products. [INST-GUID00067]

**0198 Institute for Waste Disposal (Stichting Verwijdering Afvalstoffen) (SVA)**

Postbus 184  
Amersfoort  
Netherlands

Conducts applied research on waste management policies and of waste impact on the environment. Provides advice on waste disposal to provincial and governmental authorities. Topics include: air and groundwater pollution problems; statistical analysis of quantities and composition of solid waste to be treated; optimum use of treatment facilities and refuse transport; mechanical separation of waste; pyrolysis and gasification; treatment of sewage and chemical wastes; cleaning of incinerator gases; separation of incinerator residue; labour physiology in collection systems; environmental considerations. [INST-WFE:000140]

**0199 Intron B.V.**

Dr. Nolenslaan 126  
P.O. Box 5187  
6130 PD Sittard  
Netherlands

Research centre and consulting firm specialized in using waste materials in the building industry. Topics include: waste disposal; soil pollution; water pollution; air pollution. [INST-GUID00068]

**0200 National Institute of Public Health and Environmental Hygiene**

Antonie van Leeuwenhoeklaan 9  
P.O. Box 1  
3720 BA Bilthoven  
Netherlands

Government research centre working on all the aspects of waste management, waste collection and transport, waste recycling, waste disposal and storage. Advisory body to local, regional and central government agency. [INST-GUID00065]

**0201 Netherlands Central Bureau of Statistics**

Department for Environmental Statistics  
Prinses Beatrixlaan 428  
P.O. Box 959  
NL-2270 AZ Voorburg  
Netherlands

Government agency compiling statistical information i.a. on the environment. Provides data for government policy-

## NATIONAL ORGANIZATIONS

making, pollution control and cost analysis of mitigating measures. [INST-GUID00161]

### **0202 Netherlands Institute for Fishery Investigations (RIVO)**

Haringkade 1  
P.O. Box 68  
1970 AB IJmuiden  
Netherlands

Research institute studying biology, microbiology, chemistry, biochemistry and technology aspects of the fishing industry, with special interest in the interrelation of factors, including fishery, on fish stocks in the North Sea and in fresh water. [INST-GUID00070]

### **0203 Netherlands Organization for Applied Scientific Research (Nederlandse Organisatie for Toegepast-Natuurwetenschappelijk Onderzoek) (TNO/CID)**

Schoemakerstraat 97  
Postbus 36  
NL-2600 AA Delft  
Netherlands

TNO consists of a number of more or less independent research institutes within many fields, some of which have been entered separately in this Guide. It is broadly concerned with research in science and technology, patents, chemistry, toxicology and economics. It also maintains a centre for information and documentation to disseminate scientific and technical information, which offers computerized literature and patent searches and information management consulting. [INST-GUID00222]

### **0204 Nutrition and Food Research TNO (CIVO) Institute for Fish Technology**

IVP Department  
Dokweg 37  
P.O. Box 183  
1970 AD IJmuiden  
Netherlands

Research centre specialized in technology for fish product processing and meat industry and generally for food industry. Studies air pollution and water pollution caused by the fish processing industry. [INST-GUID00071]

### **0205 Plastics and Rubber Research Institute TNO**

Research Group Plastics, Rubber, Packaging and Paint  
P.O. Box 6031  
JA Delft  
Netherlands

Research centre studying environmental effects of synthetic materials and paint and waste management of packaging materials (glass, paper, plastics). [INST-GUID00074]

### **0206 TNO Leather and Shoe Research Institute**

P.O.Box 135

Mr. van Coothstraat 55  
5141 ER Waalwijk  
Netherlands

Research centre providing consulting services and training in leather and shoes production and bio-mechanics of the feet. Environmental activities mainly concerned with leather waste water and solid wastes. [INST-GUID00206]

### **0207 Volker Stevin Roads and Asphalt B.V.**

Beneluxlaan 9  
3527 HS Utrecht  
Netherlands

Commercial firm developing technology for: using coal waste in road construction; soil pollution abatement; ground water and soil pollution prevention in waste dumps. [INST-GUID00077]

## NEW ZEALAND

### **0208 New Zealand Dairy Research Institute**

Information Centre  
Private Bag  
Palmerston North  
New Zealand

Research centre engaged in fundamental research into milk components and processes, dairy products and process development, including waste treatment and disposal. [INST-GUID00116]

## NIGERIA

### **0209 Universum Enterprises Consultants on Environmental Controls**

P.O. Box 3418  
Onitsha  
Onitsha Anambra State  
Nigeria

Consulting firm specializing in the effects of pollution from heavy metals, dyestuffs and crude oil and oil water on aquatic and non-aquatic environment. [INST-GUID00091]

## NORWAY

### **0210 Norwegian Institute of Water Research (Norsk Institutt for Vannforskning) (NTNF/NIVA)**

Royal Norwegian Council for Scientific and Industrial Research  
Postboks 333  
Blindern  
Oslo 3  
Norway

Research institute dealing with water conservation, water use and protection. Topics include: chemical analysis; environmental engineering; (humus problems, corrosion, methods for chemical, bacteriological and biological

analysis of water); water management; water pollution (investigation and quality of river, lake and fjord waters); purification of drinking water; effluent treatment; sewage treatment; acid rain; drainage systems; field investigations and sampling/testing equipment. [INST-WFEO00141]

**0211 Norwegian Referral Centre for Environmental Data  
Norwegian Central Bureau of Statistics**

B.P. 8131 DEP.

Oslo 1

Norway

Collects, produces and disseminates statistics concerned with Norwegian environment. Topics include: pollution; natural resources; energy statistics. [INST-WFEO00142]

**PAPUA NEW GUINEA**

**0212 Papua New Guinea University of Technology  
(UNITECH)**

Matheson Library

Private Bag 793

Lae

Papua New Guinea

Collects and disseminates information. Topics include: civil engineering; mechanical engineering; electrical engineering and electronics; agriculture; fishery; forestry; surveying and cartography; architecture; accounting; business management; commercial computing; appropriate technology; British and New Zealand standards; technology in general. [INST-WFEO00143]

**PERU:**

**0213 National Office for Natural Resources Evaluation  
(Oficina Nacional de Evaluación de Recursos Naturales)**

Calle 17-255

Apartado 4992 Urb.

El Palomar

Lima 100

Peru

Prepares inventories and evaluates natural resources of Peru for social and economic development purposes. Studies (at the national level) the relationship between man and the environment. Topics include: ecology; geology; climatology; land use; hydrology; forestry; soil sciences; environment; natural resources management; natural area preservation; environment assessment; pollution prevention, control, measurement, monitoring and abatement. [INST-WFEO00144]

**PHILIPPINES**

**0214 Technobank Program (TRP)**

University of the Philippines

Planning and Development

3rd Floor

Bonifacio Building

University of Life

Merako Avenue Pasig

Metro Manila

Philippines

Collects and disseminates information related to national industrial development. Topics include: patents information; legislation; appropriate technology; environment; economics; industry; trade. [INST-WFEO00145]

**POLAND**

**0215 Environmental Pollution Abatement Centre**

Institute of Environmental Protection

ul. Krucza 5/11

00548 Warsaw

Poland

Research and study of the effects of air and soil pollution on human health. Also involved in programmes related to the protection of water resources, and industrial and municipal waste management, as well as management of industrial areas. Topics include: air quality; environmental control and monitoring; emergency planning; urban planning; toxicology; waste management; effluent treatment. [INST-WFEO00146]

**0216 Forest Research Institute**

Katowice Section of Forest Management in Industrial Regions

ul. Krucza 5/11

00-548 Warsaw

Poland

Research centre, with special interest in the environmental effects of industry on forest ecosystems, including attempts at forest reclamation on post-industrial lands. [INST-GUID00108]

**0217 National Institute of Hygiene**

Instytut Naukowo-Badawczy

00-791 Warszawa

ul. Chocimska 24

Poland

Research centre on: pollution effects; environmental degradation; environmental impact assessment; health; formulation of environmental standards; industrial safety; product safety; environmental effects of pesticides. [INST-GUID00153]

**0218 Polish Academy of Sciences**

Energy Consumption Division

ul. Wolności 6

41700 Ruda Śląska

Poland

Research centre, carrying out fundamental research on: energy use; optimization of energy management; demand forecasting; energy systems analysis; public policy development on energy conservation; environmental effects of energy. [INST-GUID00211]

**0219 Sulphur Industry (SIARKOPOL)**

**Research and Development Centre**

39-405 Tarnobrzeg

Poland

Research and development centre of a major industrial concern. Environmental areas of interest include: sulphur air pollution and water pollution; land recultivation after sulphur deposit; exploration; corrosion in sulphur industry. [INST-GUID00047]

**ROMANIA**

**0220 Energy Research and Modernising Institute**

Ministry of Electrical Energy

Bd. Energeticienilor 8

Sectorul III

79619 Bucuresti

Romania

Research center carrying out research into forms of pollution relevant to electric power generation. Specialized competence in: analysis and management of air pollution; sound, thermal and electro-magnetic pollution; measuring instruments; low- and non-waste technology (L.NWT). [INST-GUID00212]

**SPAIN**

**0221 Centro Nacional de Información y Documentación**

**Instituto Nacional de Seguridad e Higiene en el Trabajo**

C/Dulcet s/n

08034 Barcelona

Spain

Collects and disseminates information. Topics include: security standards in work-places; industrial security; industrial health; ergonomics; toxicology; labor psycho-sociology; training; legislation; sanitation. [INST-WFE:000148]

**SRI LANKA**

**0222 Sri Lanka Scientific and Technical Information Centre (SI.STIC)**

**National Science Council**

47/5 Maitland Place

Colombo 7

Sri Lanka

Collects and disseminates multi-disciplinary information about science and technology. [INST-WFE:000149]

**SUDAN**

**0223 Food Research Centre**

P.O. Box 213

Khartoum North

Sudan

Research centre for the Sudanese food industry, generally concerned with technology problems, local level raw materials

in rural food industries, especially animal products. Advises on: fruit and vegetables technology; nutrition; grain processing technology; prepares consumer demand studies and feasibility studies; arranges training seminars; publishes a journal. [INST-GUID00048]

**0224 National Chemical Laboratories**

**Food Department**

Ministry of Health

P.O. Box 287

Khartoum

Sudan

Laboratory specialized in analysis and research connected with food control with advisory and administrative functions in public food control administration, including drafting of food legislation. [INST-GUID00081]

**SWAZILAND**

**0225 Science and Technology Research Unit (STRU)**

**University of Swaziland**

P.O. Kwaluseni

Swaziland

Collects and disseminates information about technology and research and undertakes education and training activities. Topics include: soil science; soil mapping; radioactive isotopes tracer service for industry; environmental pollution control; renewable energy technology projects; solar energy. [INST-WFE:000150]

**SWEDEN**

**0226 Association of Swedish Chemical Industries**

Box 5501

S-114 85 Stockholm

Sweden

Trade association covering general industrial policy, trade policy and customs policy. Pays special attention to environmental aspects, such as transport of hazardous goods and product safety legislation. [INST-GUID00020]

**0227 Consulting Engineers Ltd.**

**Marketing**

AF-IND Strins Processkonsult AB (AF-IPK)

Box 8309

S-104 20 Stockholm

Sweden

Consulting firm specializing in environmental work. Offers services related to: process systems; equipment; air pollution and water pollution monitoring; environmental monitoring in general. [INST-GUID00199]

**0228 Kjesaler & Mannerstrale AB**

Box 7124

S-171 07 Solna

**Sweden**

Consultant firm with affiliates all over Sweden, offering services related to: water pollution; air pollution; soil pollution; effluent treatment; solid waste management; lake restoration. [INST-GUID00201]

**0229 National Environmental Protection Board (Statens Naturvårdsverk)**

S-171 25 Solna  
P.O. Box 1302  
Sweden

Collects and disseminates information about nature through inspection and regulation in Sweden. Topics include: air pollution; air quality; acid rain; boilers, burners and furnaces; carbon dioxide; chimneys, flues and stacks; coal, gas and coke; de-sulphurization of fuels; electric power generation; firewood; fuels and energy sources; heating of buildings and homes; nuclear energy; oil and petrol; pollution control regulations; scrubbers, separators and filters; smoke; sulphur and sulphur dioxide; toxicology; solid waste collection, destruction, management and immersion; toxic wastes; water pollution; water treatment; aquaculture; bays and coastal areas; eutrophication; land use planning; urban development; transport management; legislation; standardization; pollution criteria, measurements and instrumentation. [INST-WFE000151]

**0230 Scandiaconsult International**

P.O. Box 35  
S-16493 Kista  
Sweden

Consulting firm offering services over most of the industrial engineering and economy sector. Industry and environment services are offered in industrial and municipal waste water effluent treatment, waste management, hazardous waste and air pollution. [INST-GUID00215]

**0231 Svensk Avfallskonvertering AB (SAKAB)**

P.O. Box 904  
S-692 29 Kumla  
Sweden

Commercial firm responsible under a Swedish government mandate for hazardous waste management in Sweden. Also offers consulting services with training, process technology, and environmental effects of waste management. [INST-GUID00193]

**0232 Swedish Environmental Research Institute (IVL)**

P.O. Box 21060  
S 100 31 Stockholm  
Sweden

Research and environmental monitoring with remote sensing studies. Topics include: technology transfer; chemical analysis; long-term effects of pollutants; water treatment and purification; environmental impact; state of the environment;

freshwater ecosystems; limnology; water quality; industrial effluents; liquid wastes; water pollution; solid wastes; marine pollution; pollutant levels; pollutants in rain and snow; health; pollution control. [INST-WFE000153]

**0233 Swedish Environmental Research Institute (IVL)**

P.O. Box 47086  
S-402 58 Goteborg  
Sweden

Provision of scientific and technical information in relation to air pollution through quantitative monitoring of the atmosphere. Topics include: research in environment monitoring and control; remote sensing; measurements within natural and modified environments; reports on the state of the environment; technology transfer; training; consulting; acid rain; industrial emissions; effects of pollutants; pollutant levels; air quality; chemistry and composition of the atmosphere; pollutants in the rain and the snow; communities and ecosystems; particulate matter; heavy metals; sampling techniques; occupational health; odour. [INST-WFE000152]

**0234 Swedish Gas Association**

Box 6405  
S-113 82 Stockholm  
Sweden

Trade association of gas producers, distributors and consumers. Promotes product safety and rational use of gaseous fuels. Provides technical advice, research and development and is engaged in public awareness activities. [INST-GUID00134]

**0235 WHO Collaborating Centre for International Chemical Reference Substances**

S-10514 Stockholm  
Sweden

Maintains information on drug standards for pharmaceuticals and a data base on suspected adverse reactions to pharmaceuticals. [INST-GUID00220]

**SWITZERLAND**

**0236 Federal Office for Environmental Protection (Office Fédéral de la Protection de l'Environnement)**

Schwartztorstrasse 53  
CH 3003 Berne  
Switzerland

Responsible for environmental protection and provides financial, technical, documentary and policy planning assistance. Topics include: surface and underground water quality and characteristics; waste management (incineration, recycling, sewage); environmental legislation; standards; industrial effluents; liquid and solid wastes; municipal wastes; organic pollutants; water pollution; eutrophication; water treatment and purification; technological development. [INST-WFE000154]

**0237 Swiss Federal Institute for Water Resources and Pollution Control (Eidgenossische Anstalt für Wasserversorgung, Abwasserreinigung und Wasserschutz) (EAWAW)**

Überlandstrasse 133  
CH-8600  
Dubendorf  
Switzerland

Undertakes research and control of aquatic environment (rivers, lakes, glaciers, underground waters) and stores information collected from field visits and pilot studies. Topics include: data collection; environment monitoring; genetic resource conservation; chemical analysis; eutrophication; pollutant identification; standards for water quality; levels of pollutants; fisheries; hydrology; limnology; water quality; technologies for pollution control; waste management; water treatment and purification; industrial and agricultural effluents; legislation; land use planning. [INST-WFE:000155]

**THAILAND**

**0238 National Environment Board**

501 Prachasumpun 4  
Rama Vi Road  
Bangkok 4  
Thailand

Stores multi-disciplinary information collected from the divisions of the Board. Helps research in natural resources use, management and protection. Collects statistics and (monitored) data about environment. Also assists with technology transfer and technical assistance for industrial promotion, training and education. Topics include: urban, industrial, agricultural pollution; water, air, soil pollution; urban industrial, rural development; solid and liquid wastes; environment planning; environment policies; industrial standards; industrial sites; water treatment and purification; marine biology; chemicals; water analysis; sanitation and health; tropical care; land use planning and development; regional development; climatology; mineral resources; biological control; pesticides; detergents; forests; remote sensing; industrial promotion. [INST-WFE:000156]

**0239 Thai Institute of Science and Technical Research's Agro Technology Department**

196 Phahonyothin Rd.  
Chatuchak  
Bangkok 10900  
Thailand

Research centre providing analysis and advice on agriculture and agro-industry. [INST-GUID00177]

**TUNISIA**

**0240 Institut des Régions Arides  
Centre d'Information et de Documentation**

Elife  
Medenine  
Tunisia

Conducts research, data analysis, mapping and technical assistance. Topics include: agricultural economy; agricultural machinery; agricultural production, and semi-arid ecosystems; conservation of genetic resources; species in danger; erosion; soil restoration; landscape; reforestation and re-vegetation; rural zones; resource management; animal selection; wild fauna and flora; soil conservation, degradation, improvement and sciences, vegetation. [INST-WFE:000157]

**UGANDA**

**0241 Governmental Analytical Laboratory**

P.O. Box 2174  
Kampala  
Uganda

Research and analysis in organic and non-organic chemistry. Topics include: water chemical analysis; chemical structures and properties; chemistry; pollution control; physico-chemical processes; radioactive substances; decontamination; food contamination; long-term effects of pollutants; toxic substances; toxic plants; medicinal plants; water quality in rivers and lakes; coal; food analysis; nutrition. [INST-WFE:000158]

**0242 Institute of Public Health**

P.O. Box 7072  
Kampala  
Uganda

Undertakes fundamental and applied research in chemistry, along with sanitary and medical aspects. Topics include: education and training; health protection; consulting services and expert assistance; environmental protection; diseases; pathology and physiology; family planning; hospitals and health centres; human settlements; food additives and colouring; malnutrition; long-term effects of pollutants; medical care and treatment; metabolism; mutagenetics; side-effects of medication; trace-metals and residues; vectors of human diseases. [INST-WFE:000159]

**UNITED KINGDOM OF GREAT BRITAIN  
AND NORTHERN IRELAND**

**0243 AFRC Institute of Food Research (IFR)**

Colney Lane  
Norwich  
Norfolk NR4 7UA  
United Kingdom

Independent, publicly funded, research institute. Carries out



research on food (mainly medium- or long-term) in support of the broad interest of consumers and the food industry. Areas of specialist knowledge include: nutrition; consumers; food safety; food preservation; biotechnology. [INST-GUID00012]

**0244 Agricultural and Food Research Council  
Policy Division**

160 Great Portland Street  
London W1N 6DT  
United Kingdom

Independent body funded by the Department of Education and Science, receiving commissions from the Ministry of Agriculture, Fisheries and Food and undertaking research for industry and other bodies. Through its affiliated research centres and higher education departments, the council promotes and coordinates research for food industry, agriculture, non-medical biology and biotechnology. [INST-GUID00187]

**0245 Allott and Lomax, Consulting Engineers**

Fairbairn House  
Ashton Lane  
Sale  
Manchester M33 1WP  
United Kingdom

Commercial firm offering consulting services on: civil and structural engineering design; water supply; sewage treatment; environmental health; effluent treatment; environmental impact assessment (EIA); tall chimney design to reduce air pollution. [INST-GUID00010]

**0246 BCIRA: Environmental Consultancy Services**

Alvechurch  
Birmingham  
West Midlands B48 7QB  
United Kingdom

Research centre providing advice to members on all aspects of the working environment in foundries and of external pollution arising from metal casting. Also undertakes tasks on a consulting basis. [INST-GUID00165]

**0247 BIBRA Toxicology International**

Woodmansterne Road  
Carshalton  
Surrey SM5 4DS  
United Kingdom

Trade association for British industry, with research centre, information centre and training facilities, promoting research and other scientific work on toxicology. [INST-GUID00170]

**0248 Booth and Smith Associates**

Ingleby  
Leiby DE7 1HW  
United Kingdom

Consulting firm in food science and technology. Has expertise on: food production; product development and marketing; quality control; food storage and food preservation. Undertakes design and commissioning of complete food processing plants. [INST-GUID00029]

**0249 Borax Research Ltd.**

Cox Lane  
Chessington  
Surrey KT9 1SJ  
United Kingdom

Consulting firm undertaking research on general inorganic chemistry with particular reference to: boron; ceramics and glass; corrosion inhibition; fire prevention; agro-chemicals; mineral processing; mineralogy; non-ferrous metals; wood preserving. [INST-GUID00113]

**0250 British Agrochemicals Association Ltd. (BAA)**

4 Lincoln Court  
Lincoln Road  
Peterborough  
Cambridgeshire PE1 2RP  
United Kingdom

Trade association of manufacturers, formulators and distributors of agro-chemicals in the UK. [INST-GUID00172]

**0251 British Coal Corporation  
Liquefaction Project**

Point of Ayr Facility  
Ffynnongroew Clwyd  
North Wales CF8 9JJ  
United Kingdom

Research centre, engaged in the development of a liquid solvent extraction method for coal liquefaction. Aims to produce an economically viable as well as environmentally acceptable process for production of premium liquid transport fuels such as petroleum and diesel. [INST-GUID00196]

**0252 British Glass Manufacturers Confederation**

Northumberland Road  
Sheffield  
South Yorkshire S10 2UA  
United Kingdom

Manufacturers association carrying out: sampling and analysis of emissions from glass furnaces; analysis of factory atmosphere; noise surveys in factories; determination of toxicity of metal release from glass - micro-analysis, mainly of lead and cadmium. [INST-GUID00038]

**0253 British Leather Confederation**

Leather Trade House  
Kings Park Road  
Moulton Park  
Northampton NN3 1JD

**United Kingdom**

Professional association for the British leather industry. Among environmental concerns, with particular reference to leather industry waste, are: pollution control; recycling and recovery of materials; solid waste management; toxicity of metals. Maintains a data base on low- and non-waste technology (LNWT). [INST-GUID00033]

**0254 British Non-Ferrous Metals Federation  
Metals Technology Centre**

**Environmental Consultancy Service  
Technical Services**

Denchworth Road  
Wantage  
Oxfordshire OX12 9BJ  
United Kingdom

Trade association, research centre and consulting firm, specializing in metals testing and research. [INST-GUID00111]

**0255 British Plastics Federation  
Environment Committee**

5 Belgrave Square  
London SW1X 8PH  
United Kingdom

Trade association for the U.K. plastics industry. Covers all aspects of plastics from raw material to finished product. Concerned with environmental aspects of: packaging; waste management; recycling; fire prevention; biological safety; industrial health, safety and noise. [INST-GUID00014]

**0256 British Steel plc**

Head Office  
9 Albert Embankment  
London SE1 7SN  
United Kingdom

Commercial firm involved in all process stages of iron and steel production. Industry and environment concerns include: reduction of benzol emissions; coke production; waste utilization; reduction of NO<sub>x</sub> from pickling lines; electrostatic precipitation; dust pollution from steel making and coke processing; biological effluent treatment; energy saving; recycling; research and development related to pollution control, waste management and industrial safety. [INST-GUID00207]

**0257 British Textile Technology Group  
Environmental Services**

Shirley Towers  
Didsbury  
Manchester M20 8RX  
United Kingdom

Consulting firm specialized in technology services for the UK textile industry. In the environment sector, services include: effluent treatment; environmental engineering; design of equipment; water conservation; energy saving; dust and noise

control; industrial safety; protective clothing; carpets and floor coverings. [INST-GUID00044]

**0258 British Textile Technology Group (BTTG)**

Shirley Towers  
Didsbury  
Manchester M20 8RX  
United Kingdom

Consulting firm undertaking studies related to: manmade fibres, polymers, textiles, clothing (including protective clothing); gas and liquid filtering; water management; effluent treatment; dust and noise pollution and reduction; industrial safety especially with regard to chemicals, microbial contamination and geo-textiles. [INST-GUID00086]

**0259 Burgoyne Consultants Ltd.**

39A Bartholomew Close  
London EC1A 7JN  
United Kingdom

Consulting firm (scientists and engineers) specializing in: fire prevention; explosives; spread of flammable and toxic gas; chemical hazardous goods. [INST-GUID00017]

**0260 Central Scientific Laboratories**

445 New Cross Rd  
London SE14 6TA  
United Kingdom

Consulting firm undertaking microbiological and chemical analysis in the food industry and on: soaps and detergents; fruit and vegetables processing; meat; cocoa and chocolate; essential oils; legislation; food storage. Other areas of work include: water analysis; sugar; animal feeds; fertilizers; toys and consumer goods. [INST-GUID00041]

**0261 Centre for Environmental Management and Planning (CEMP)**

Auris Business Centre  
23 St Machar Drive  
Old Aberdeen AB2 1RY  
Scotland  
United Kingdom

Research centre dealing with the environmental sector in general, specifically environmental management, environmental planning and environmental impact assessment. [INST-GUID00102]

**0262 Centre for Environmental Studies**

62 Chandos Place  
London WC2N 4HH  
United Kingdom

Research into the social and economic aspects of urban and regional planning. Specific areas under study include: economics of housing policies; industrial location and restructuring; land use planning. Topics include: urban and regional land use planning; housing; social and economic aspects; en-

vironmental impact; environmental pressures; environmental programmes; housing standards; housing programmes; economic planning. [INST-WFE:000160]

**0263 Chatfield Applied Research Laboratories Ltd.**

Newton House  
Byers Lane  
South Goldstone  
Surrey RH9 8JH  
United Kingdom

Research centre and laboratory undertaking various kinds of analysis for environmental purposes: atmosphere; detection of industrial air pollution; detection and analysis of overspray from industrial coating processes; detection of toxic constituents in effluents; water analysis of materials for disposal dumps; corrosion prevention. [INST-GUID00163]

**0264 Chem Systems International Ltd.**

28 St. Jame's Square  
London SW1Y 4JH  
United Kingdom

Commercial firm undertaking studies on environmental effects of a range of industrial activities, particularly in chemicals, petroleum refineries and fuel burning equipment. Assesses the size and seriousness of potential pollution sources. [INST-GUID00031]

**0265 Clayton and Bostock Hill & Rigby Ltd.**

288 Windsor Street  
Birmingham  
West Midlands B7 4DW  
United Kingdom

Consulting firm specializing in environmental services, such as: water analysis and management; testing; environmental monitoring; water and waste water treatment; hazardous goods storage and handling; environmental impact assessment (EIA); environmental auditing; industrial safety surveys. [INST-GUID00202]

**0266 Coal Research Establishment**

Stoke Orchard  
Cheltenham  
Gloucestershire GL52 4RZ  
United Kingdom

Research and information centre specializing in: coal utilization research; metallurgical coal and coke manufacture and properties; briquette fuels; by-products from coal processing; industrial and domestic combustion; air pollution control; coal conversion; electric power generation by combustion; liquid fuels; fuel gases; chemical feed stocks. Maintains a library for coal utilization technology, environment, chemical engineering, chemistry and related areas. [INST-GUID00141]

**0267 Department of the Environment (DOE)**

Headquarters Library

2 Marsham Street  
London SW1P 3EB  
United Kingdom

Serves the Departments of Environment and Transport, providing information on all aspects of their work from published/unpublished sources, including new developments and assistance in solving current problems. Topics include: architecture; construction; building materials; historical and archaeological structures; countryside; recreation; housing programme, standards, finance and subsidies; inland waterways; canals; land use planning and development; urban planning; renewal planning; forestry and silviculture; sand and gravel extraction; derelict lands; nature conservation; air pollution; land pollution; water pollution and contamination; marine pollution; sewage systems; water resources; water quality; water management; water supply; potable water; water treatment; hydraulics; waste disposal, management and recycling; radioactive wastes. [INST-WFE:000165]

**0268 Dr. J. Davis and Partners**

52 London Road  
Reading  
Berkshire RG1 5AS  
United Kingdom

Consulting firm specialized in: food and dairy products technology; food analysis; nutrition; industrial hygiene; public health; industrial microbiology; detergents; food preservation; effluent treatment. [INST-GUID00027]

**0269 Environmental Control Consultancy Services Ltd.**

Kiln Acre  
Wickham Road  
Fareham  
Hampshire PO16 7HZ  
England

Process engineers, specialized in: water management and effluent treatment; biological treatment of waste; solid waste management; physical-chemical separation of waste; environmental engineering design; information retrieval. [INST-GUID00051]

**0270 Environmental Data Services Ltd (ENDS)**

Finsbury  
Business Centre  
40 Bowling Green Lane  
London EC1R 0NE  
United Kingdom

Independent research and information centre, providing industrial and trade societies with services related to management of environmental problems management. Also studies policies and projects concerning energy management, resource conservation and waste management. Topics include: environmental priorities; pollution hazards; air and water pollution; soil contamination; environmental health; waste collection, treatment, destruction and recycling; toxic wastes;

legislation; pollution criteria; occupational safety; scientific and technical information; noise; energy conservation; coal and oil; energy sources. [INST-WFE:00163]

**0271 Environmental Research Group (ADAS)**

**Central Science Laboratory**

Government Buildings  
Hook Rise South  
Totworth, Surbiton  
Surrey KT6 7NF  
United Kingdom

Laboratory and research centre under the Ministry of Agriculture, Fisheries and Food, carrying out research and investigation and advising on the environmental effects of agro-chemicals. Areas of concentration include: interaction of pesticides and terrestrial vertebrates and honey bees; methods of determining the toxicity of pesticides for vertebrates and honey bees. [INST-GUID00147]

**0272 Environmental Resources Ltd (ERL)**

106 Gloucester Place  
London W1H 3DB  
United Kingdom

Multi-disciplinary research and consulting organization covering: pollution and environmental impact monitoring; pollution control measures and their implementation; waste disposal strategy and operational plans; technical forecasting and environmental risk assessment; analysis and assessment of environmental data. Topics include: pollution control; resource management; environmental management and legislation; waste disposal; solid wastes; waste recovery; air and water pollution; air and water contamination; eutrophication; pollution control technology; marine pollution. [INST-WFE:000164]

**0273 Environmental Sciences Research Unit (ESRU)**

**Documentation Centre**  
Cranfield MK 43 0AI.  
Bedfordshire  
United Kingdom

Research institute dealing with technologies applied to environment and providing technical consulting services. Topics include: education and training; technology transfer; renewable sources of energy; storage and conservation of energy; conservation of genetic resources; genetic engineering; bacteriology; biodegradation; hydrocarbons and derivatives; microbiology; organic and mineral oils; organic pollutants; pollution control; appropriate technologies; technological development; waste treatment and disposal. [INST-WFE:000161]

**0274 FW Bank Preece Limited**

**Corporate Affairs**  
Prudential House

North Street  
Brighton  
East Sussex BN1 1RZ  
United Kingdom

Consulting firm undertaking environmental impact assessment (EIA) studies; base-line surveys; water pollution and air pollution studies; toxic and non-toxic discharge analysis; thermal pollution assessment; effluent treatment; recycling. [INST-GUID00026]

**0275 Foster Wheeler Energy Ltd.**

Foster Wheeler House  
Station Road  
Reading  
Berkshire RG1 1LX  
United Kingdom

Consulting firm undertaking systems design, construction, operation and maintenance and repair of a wide range of process plants and utilities. Provides environmental planning infrastructure for petroleum refineries, gas, coal, fertilizer, pharmaceuticals and petrochemicals plants. Produces air pollution, water pollution and noise pollution control equipment. [INST-GUID00025]

**0276 Grace Service Chemicals: Grace Dearborn Ltd.**

Foundry Lane  
Widnes  
Cheshire WA8 8UD  
United Kingdom

Consulting firm and suppliers of chemicals and equipment for process water and effluent treatment. Further specialized competence in: combustion; fuel oil treatment; energy conservation; environmental management of pulp and paper and food industry. [INST-GUID00197]

**0277 Harwell Laboratory**

**Waste Management Information Bureau**  
Building 7-12 Harwell Laboratory  
Didcot  
Oxfordshire OX11 0RA  
United Kingdom

National referral centre for information and advice on all aspects of domestic and industrial solid waste, sludge, effluent and gaseous, non-radioactive waste management. Maintains an on-line data base of waste information and provides an international information service and a free inquiry service as well as publishing a monthly journal - "Waste Management Today". [INST-GUID00140]

**0278 Hazelton UK**

Otley Road  
Harrogate  
North Yorkshire HG3 1PY  
United Kingdom

Consulting firm offering laboratory services and analysis of pharmaceuticals, agro-chemicals and other industrial chemicals, consumer goods and other potentially hazardous substances. Undertakes residue analysis of pesticides, pharmaco-kinetic studies, environmental fate studies and other studies and analyses related to industrial safety and product safety. [INST-GUID00219]

**0279 IAL Consultants Ltd.**

14 Buckingham Palace Road  
London SW1W 0QP  
United Kingdom

Management consulting firm specializing in plastics, packaging, chemicals and related process industries. Also offers services related to: metals and metal working industries; instrumentation; air pollution and water pollution; paints and varnishes. [INST-GUID00011]

**0280 ICI Agrochemicals**

Environmental Sciences Department  
Jealott's Hill Research Station  
Bracknell  
Berkshire RG12 6EY  
United Kingdom

Research centre specializing in the environmental effects of pesticides. [INST-GUID00198]

**0281 Institute of Energy**

18 Devonshire Street  
London W1N 2AU  
United Kingdom

Professional organization for energy engineers and others concerned with economic aspects of energy production and utilization. Publishes magazines and journal of referred papers and holds technical conferences on energy and fuel. Main areas of interest are: combustion/fluidized combustion; energy management; alternative energy sources; education of practitioners in all facets of energy and its use, including the nuclear energy field. [INST-GUID00154]

**0282 Institute of Environmental Sciences (IES)**

14 Prince Gate  
Hyde Park  
London SW7 1PH  
United Kingdom

Topics include: information; atmosphere; ocean; water pollution; energy; agriculture; ecology; landscape; flora and fauna. [INST-WFE000167]

**0283 Institute of Solid Waste Management**

28 Portland Place  
London W1N 4DE  
United Kingdom

Promotes scientific, technical and practical aspects of solid and semi-solid waste management, including the collection,

treatment, utilization and disposal of domestic, urban, commercial, trade and industrial wastes to safeguard the environment. Topics include: refuse collection organization, methods and economic use of transport; street cleaning methods (manual, mechanical and vacuum sweeping); gully and cesspool organization; refuse disposal (landfill techniques, incineration, composting, pulverization); solid waste disposal techniques; waste management; industrial solid wastes; domestic refuse; domestic refuse sorting; municipal waste disposal; waste collection. [INST-WFE000168]

**0284 Institute of Wastes Management (IWM)**

9 Saxon Court  
St. Peter's Gardens  
Northampton NN1 1SX  
United Kingdom

Institution concerned with research and information in the field of waste management. Holds professional examinations and publishes monthly journal as well as technical monographs. [INST-GUID00045]

**0285 Institute of Water Pollution Control**

Ledson House  
53 London Road  
Maidstone  
Kent ME16 8JH  
United Kingdom

Promotes the development of science and practices related to water pollution control. Topics include: liquid effluents and used water treatment and management; prevention, contamination and control technologies; industrial effluents; water pollution processes; water treatment and purification; water treatment plants and processes. [INST-WFE000169]

**0286 Institution of Chemical Engineers (IChemE)**

Davis Building  
165-171 Railway Terrace  
Rugby CV21 3HQ  
United Kingdom

Professional organization and learned society working to develop the chemical engineering profession, including industrial safety and environmental concerns. Offers training programmes, publishes journals and books and maintains information centre. Publishes Safe Handling of LPG: No. 1: Pressurized Bulk Storage and Road and Rail Loading. [INST-GUID00168]

**0287 International Food Information Service (IFIS)**

Lane End House  
Shinfield  
Reading  
Berkshire RG2 9BB  
United Kingdom

Information centre specializing in food science and technol-

ogy. Publishes a monthly food, science and technology abstract journal and maintains on-line data bases. CD-ROM services are under development. [INST-GUID00191]

**0288 International Institute for Environment and Development (IIED)**

10 Percy Street  
London W1P 0DR  
United Kingdom

Aims to further the wise use of natural resources to sustain economic growth and serve basic human needs. Topics include: policy research; information and field activities about environment/development relationships; collection of information (documents of various kinds) and publication of books and articles that reflect the concern of the developing world; natural resources; energy (biomass/bioconversion); solar; nuclear; wind; water; water resources; forests and fisheries; environmental legislation; environmental management and planning; environmental misconduct; environmental policy; human settlements; land-carrying capacity; long-term trends; mineral resources; mutagenetics; pollutant effects; public health and sanitation; resource appraisal; soil capabilities. [INST-WFEO00166]

**0289 John Ashworth & Partners**

Touchin Laboratories  
Ainsworth House  
Bury Road  
Haslingden  
Lancashire BB4 5PG  
United Kingdom

Commercial firm offering consulting services in chemical analysis, particularly of: plastics; rubber; paints and varnishes; coatings; resins; building materials; concrete and cement. Has paint laboratory with testing facilities and carries out corrosion testing, site assessment and advisory services. [INST-GUID00008]

**0290 John Wilkinson**

191 Bolton Road  
Rochdale  
Lancashire OL11 3LR  
United Kingdom

Consulting firm offering general chemical engineering services, including related to pollution control in chemical engineering processes. [INST-GUID00218]

**0291 Kodak Ltd**

Company Health, Safety and Environment Department  
Environmental Advisory Services  
Headstone Drive  
Harrow  
Middlesex HA1 4TY  
United Kingdom

Manufacturer of photographic equipment and chemicals.

Maintains environmental advisory services which will assist with queries related to the environmental effects of photographic chemicals, related waste disposal and recovery of silver from photographic processing solutions. [INST-GUID00110]

**0292 L.G. Mouchel & Partners, Consulting Engineers Ltd.**

West Hall  
Parvic Road  
West Byfleet  
Weybridge  
Surrey KT14 6EZ  
United Kingdom

Consulting firm offering engineering services. Competence includes: environmental impact assessment; waste management; water management; effluent treatment; pollution control. [INST-GUID00204]

**0293 Lead Development Association**

42 Weymouth Street  
London WIN 3LQ  
United Kingdom

Information service on health, safety and environment related to lead. [INST-GUID00136]

**0294 Manderstam Consulting Services (ENG.)**

Chelsea Harbour  
London SW10 0XD  
United Kingdom

Consulting firm specializing in engineering, particularly related to the food sector, agriculture, agro-chemicals, metallurgy, chemicals and petroleum industry. Topics include: environmental health and safety; development and implementation of cost effective environmental management; planning for location of industry; occupational hygiene - particularly with regard to compliance and liability evaluation. [INST-GUID00192]

**0295 Mass Transfer International**

Haversham  
Cumbria LA7 7EB  
United Kingdom

Consulting firm specializing in engineering services and equipment for domestic and industrial waste water and effluent treatment, including waste from dairy products industry, breweries, distilling, canning, textile industry, chemical industry, slaughtering, pulp and paper industry and fish farming. [INST-GUID00203]

**0296 Medical Research Council**

Toxicology Unit  
Woodmansterne Road  
Carshalton  
Surrey SM5 4FF  
United Kingdom

Research centre undertaking toxicology studies of carcinogens, pesticides, plant poisons, mycotoxins, heavy metals and industrial chemicals. Also undertakes studies on the mode of action of neurotoxins, hepatotoxins and agents that specifically damage the liver and lung. Develops methods for monitoring exposure to carcinogens. [INST-GUID00127]

**0297 Moldow Ltd.**

114 Ermscote Road  
Warwick CV34 5QJ  
United Kingdom

Commercial firm specializing in: waste extraction systems design; supply and assembly for the woodworking industry; design, procurement and supervision of installation of energy equipment (heating, air-conditioners, heat recovery and electric power/power generation). [INST-GUID00003]

**0298 National Industrial Fuel Efficiency Service Ltd. (NIFES)**

Charringtons House North  
The Causeway  
Bishops Stortford  
Herts CM23 2ER  
United Kingdom

Consulting firm offering services over the general industry/environment sector, with particular experience in energy. Other areas of expertise include: environmental auditing; pollution analysis; waste management; chimney design; noise pollution; fire prevention; water treatment. [INST-GUID00042]

**0299 National Power**

**Technology and Environmental Centre**

Kelvin Avenue  
Leatherhead  
Surrey KT22 7SE  
United Kingdom

Research centre and information centre on environmental impact of electric power generation, particularly emissions control. [INST-GUID00138]

**0300 National Society for Clean Air (NSCA)**

136 North Street  
Brighton, BN1 1RG  
United Kingdom

Organization dedicated to promoting clean air through the reduction of pollution. Publishes papers, books, reports and educational material as well as the journal Clean Air and an annual NSCA pollution handbook. [INST-GUID00130]

**0301 Natural Resources Institute (NRI)**

**Library and Information Services**

Central Avenue  
Chatham Maritime

**Kent ME4 4TB**

United Kingdom

Research centre collaborating with developing countries to: improve pest control and identification; post-harvest agri-product processing; storage handling and packaging; industrial development; marketing; soil and water resources. [INST-GUID00166]

**0302 Paint Research Association**

**Information Department**

8 Waidegrave Road  
Teddington  
Middlesex TW11 8LD  
United Kingdom

Collection and dissemination of technical information on: environmental effects of paint manufacture and use; toxicity of paints and paint raw materials. [INST-GUID00139]

**0303 PERA International**

**Membership Services**

Melton Mowbray  
Leicester LE13 0PB  
United Kingdom

Research and information centre dealing with topics related to the manufacturing industry, including: recycling; energy conservation; water treatment; noise pollution; waste management; pollution control. [INST-GUID00179]

**0304 Pierson and Company Ltd. Contracting Engineers**

Thrift Street  
Wollaston  
Northamptonshire NN9 7QJ  
United Kingdom

Consulting firm offering services related to: sludge filters for process and effluent treatment; liquid/solid separation. [INST-GUID00205]

**0305 Royal Society of Chemistry (RSC)**

**Information Centre**

Nottingham NG7 2RD  
United Kingdom

Collects and disseminates information about chemicals. Topics include: chemicals used in agriculture; pesticides; chemical properties; toxicity (physical, chemical, analytical, toxicological, production data). Prepares chemical abstracts on analytical chemistry and its application (references of articles printed in specialized or non-specialized press) and chemical engineering abstracts (analysis/synthesis of 1:30 periodicals from the entire world). [INST-WFI:000162]

**0306 Royal Society of Chemistry**

**Sales and Promotion Department**

Thomas Graham House  
Science Park  
Milton Road

Cambridge CB4 4WF  
United Kingdom

Professional association maintaining an information centre, data bases and publishing scientific books and journals concerning all aspects of chemistry. [INST-GUID00184]

**0307 Scientific Documentation Centre Ltd**

Halfbeath House  
Kingsear Road  
Halfbeath  
Dunferline KY12 0TZ  
Fife  
United Kingdom

Commercial organization providing a comprehensive information service. Dissemination is weekly and concerns current and special problems on ca. 1400 standard topics i.a.: ecology; pollution; biology; toxicity; technology; water, natural resources, energy and fuels; wastes. Topics include: water and air pollution; water technologies; water and wastes treatment; sewage systems; chemistry; heavy metals and radioactive wastes; sanitation and public health; hazards and safety subjects; health standards; urban planning; technology transfer; scientific and technical information; chemical analysis; analytical instruments; energy sources and fuels; crime prevention and law enforcement. [INST-WFE:000171]

**0308 Scott Wilson and KirkPatrick**

Scott House, Basing View  
Basingstoke  
Hampshire RG21 2JG  
United Kingdom

Consulting firm with specialized expertise in environmental studies. Services cover: pollution control; hazardous waste and other waste management; environmental management; environmental impact assessment (EIA); environmental monitoring and modelling. [INST-GUID00103]

**0309 Sheffield Centre for Environmental Research**

299 Western Bank  
Sheffield  
South Yorkshire S10 2UD  
United Kingdom

Promotes research in planning and design of the physical and social environment to advance knowledge and education of the public on environment. Topics include: environmental awareness; research; information; landscape; built environment; urban areas; rural areas; ecology; educating public opinion. [INST-WFE:000172]

**0310 Simon-Carves Ltd.**

Simon-Carves Ltd.  
Sim-Chem House  
P.O. Box 17  
Cheadle Hulme  
Cheadle

Cheshire SK8 5BR  
United Kingdom

Commercial firm undertaking: liquid and solid waste disposal and treatment; vitrification of nuclear waste; pollution control; flue gas de-sulphurization; bulk material handling systems; chemicals and petrochemicals pollution; ores; fertilizers; glass raw materials; handling and transport of waste. [INST-GUID00046]

**0311 Steel Castings Research and Trade Association (SCRTA)**

7 East Bank Road  
Sheffield  
South Yorkshire S2 3PT  
United Kingdom

Research centre specialized in industrial safety and health aspects of steel castings manufacture, especially dust pollution and noise pollution. Specialized competence on environmental pollution from steel foundry operation. [INST-GUID00133]

**0312 Technica Ltd.**

Lynton House  
7/12 Tavistock Square  
London WC1H 9LT  
United Kingdom

Consulting firm specialized in: major hazards; industrial safety assessment; risk management; reliability studies; marine safety; transportation studies; environmental auditing; noise and vibration studies; nuclear safety; safety training. [INST-GUID00125]

**0313 Warren Spring Laboratory Publications**

Gunnel's Wood Road  
Stevenage  
Hertfordshire SG1 2BX  
United Kingdom

Laboratory and research centre providing technical services in the environmental sector, particularly on pollution problems where process industries interact with the environment. Has extensive laboratory and pilot-scale facilities and is the environmental technology executing agency of the Department of Trade and Industry (DTI). Apart from government, clients are non-governmental organizations and industry. [INST-GUID00146]

**0314 Warrington Fire Research Centre**

Holmesfield Road  
Warrington  
Cheshire WA1 2DS  
United Kingdom

Research centre specialized in matters relating to fire and fire safety. Undertakes approval, testing and certification of fire protection products in conjunction with the British standards



institution. Provides office consultation in fire safety assessment. [INST-GUID00030]

**0315 Waste Management Information Bureau (WMIB)**

United Kingdom Atomic Energy Research

Bldg 151

Harwell Laboratory

Didcot

Oxfordshire OX11 0RA

United Kingdom

National Advisory Centre on waste management with maintenance of a computerized bibliographic data base of relevant literature. Topics include: referral centre; consulting services; relationships with UMPLIS (Berlin, F.R. of Germany), ANRED (Angers, France) and INFOTERRA (UNEP, Nairobi, Kenya); wastes of all type, including solid wastes, liquid wastes, mud and sludge from all sources and origins (in the case of gaseous wastes, the information covers discharges due to industrial processes). [INST-WFE000173]

**0316 Water Engineering Ltd.**

Aynho Road

Adderbury

Banbury

Oxfordshire OX17 3NL

United Kingdom

Consulting firm offering services related to water management: municipal and industrial waste water; water supply; industrial process water; project planning and management services. [INST-GUID00194]

**0317 Water Information Centre**

National Water Council

4 Queen Anne's Gate

London SW1H 9BT

United Kingdom

Provides a comprehensive information and library service for the National Water Council, the Water Space Amenity Commission, water authorities and other organizations and individuals with a bona fide interest in the water industry of England and Wales. Topics include: water resources; water supply; sewage systems; water pollution; water treatment; water quality; waste water treatment; waste water disposal; sludge disposal; drainage systems; recycling; drinking water treatment; potable water; water pipes; land drainage; fisheries; water recreation and amenity; aquatic amenities. [INST-WFE000174]

**0318 Water Research Centre**

Stevenage Laboratory

Elder Way

Stevenage

Herts SG1 1TH

United Kingdom

Collection, analysis and dissemination of information to help

research and application of all aspects related to water supply and water resources pollution. Topics include: water treatment, quality, monitoring and control; industrial effluents; drinking water quality; instrumentation control and computing; water sampling and analysis; resource development and management; river management; natural and engineered drainage systems; tidal waters; subterranean waters; rivers and streams; estuarine ecosystems; distribution systems; sewerage systems; sludge utilization. [INST-WFE000175]

UNITED STATES OF AMERICA

**0319 Air and Waste Management Association**

P.O. Box 2861

Pittsburgh PA 15230

United States

Organization promoting research and technical information on pollution and waste management. Publishes the Air Pollution Control Association Journal, arranges meetings and seminars and conducts training courses. [INST-GUID00169]

**0320 American Association of Textile Chemists and Colorists**

P.O. Box 12215

Research Triangle PK

North Carolina 27709 - 2215

United States

Trade association providing information on textile dyeing and finishing and on methods of evaluation for textile products. [INST-GUID00142]

**0321 American Petroleum Institute**

Central Abstracting & Indexing Service

Client Services

275 Seventh Avenue

New York, New York 10001

United States

Abstracting and indexing service for technical and business literature and patents in the energy, petrochemical and petroleum industry, including processing and products, transportation and storage, environmental effects of petroleum derived energy and chemicals used in oil fields. [INST-GUID00099]

**0322 The Asphalt Institute  
Engineering Office**

P.O. Box 40512

Lexington, Kentucky 40512-4052

United States

Consulting firm undertaking bitumen and asphalt research and training, including design and construction of asphalt pavements, paving mixtures and roofing asphalts. Publications on asphalt technology and on pollution from industrial processes utilizing asphalts. [INST-GUID00092]

**0323 Association of State & Territorial Solid Waste Management Officials**

444 N. Capitol Street NW  
Suite 388  
Washington D.C. 20001  
United States

Professional association and public interest group, representing the state's solid and hazardous waste managers. Conducts training workshops and surveys on hazardous waste and superfund issues. [INST-GUID00178]

**0324 Cambridge Scientific Abstracts (CSA)**

5161 River Road  
Bethesda, Maryland 20826  
United States

Collects and disseminates information about environment. Topics include: environmental quality; sources and criteria of pollution; air, water, soil and marine pollution; thermal pollution; radioactive pollution; noise; pesticides; waste water treatment. [INST-WFEO00178]

**0325 Chemical Industry Institute of Toxicology**

**Research Information**

P.O. Box 12137  
Research Triangle PK  
North Carolina 27709  
United States

Research centre studying toxicological problems related to industrial safety and product safety. Involved in the manufacture, handling, use and disposal of chemicals, pharmaceuticals and consumer goods. [INST-GUID00129]

**0326 Chemical Information Branch (EPA)**

**United States Environmental Protection Agency**

401 M. Street SW  
MS-TS793  
Washington D.C. 20460  
United States

Collection and dissemination of data (references, records, profiles) about chemical use and production in the world. Topics include: chemicals' characteristics and compounds; their fate when discharged into the environment; transformation rate in water, air and soil; biodegradation, oxidation and hydrolyses; physics and chemistry of chemical compounds; their use and production over the world. [INST-WFEO00179]

**0327 Ecological & Toxicological Association of Dyestuffs Manufacturers Industry (ETAD)**

**United States Operating Committee**

1330 Connecticut Avenue NW  
Suite 300  
Washington D.C. 20036-1702  
United States

Manufacturers association, providing information on: manufacturing of dyes; analysis; environmental effects;

toxicity; industrial product safety. [INST-GUID00034]

**0328 Engineering Index Inc**

345 East 47th Street  
New York, New York 10017  
United States

Collection and selective dissemination of information about engineering in the United States. Topics include: geology and biology; chemistry; agriculture and food; electrical control and electronics; industry and management; mathematics; instrumentation. [INST-WFEO00180]

**0329 Environment Information Centre (EIC)**

48 West 38th Street  
New York, New York 10018  
United States

Collection, management, and dissemination of information about environment (see also ACID RAIN and ENVIROLINE databases). Topics include: air, water quality and pollution; atmospheric conditions; climate variations; noise; health (food, medication, chemical and biological contamination, radioactivity); earth (renewable and non-renewable resources, wastes, transports, wild flora and fauna); other aspects of environment; science; technology; education; management; planning; demographic control; legislation; economy. [INST-WFEO00181]

**0330 Environmental Protection Agency (EPA)**

**Public Information Center, Washington**

401 M Street SW  
Washington D.C. 20460  
United States

Public information centre, primary contact point for non-technical information about environment and the EPA. Responds to calls and letters, distributes non-technical EPA publications, prepares information packages and kits and receives and guides visitors. Technical questions are referred to the appropriate EPA office or other government agencies. [INST-GUID00122]

**0331 Environmental Studies Institute**

2060 Alameda Padre Serra  
Suites 105-106  
Santa Barbara, California 93103-1795  
United States

Collection and dissemination of information about environment. Topics include: air, water and soil pollution; noise; solid wastes; animal ecology; energy; nutrition; health; urban planning; erosion; soil mechanics; marine biology. [INST-WFEO00183]

**0332 Environmental Study Conference (ESC)**

H2-515 House Annex 2  
United States Congress  
Washington D.C. 20515

**United States**

Collection of data about energy and environment for legislative objectives in the United States and other countries. Topics include: all subjects related to environment and legislation (rules, laws, standards). [INST-WFEO00184]

**0333 Institute of Paper Science and Technology  
Information Services Division**

575 14th Street N.W.  
Atlanta, Georgia 10318  
United States

Institute for graduate education, research and information for paper science and technology. [INST-GUID00128]

**0334 Institute of Scrap Recycling Industries Inc.**

**Public Relations Office**

1627 K Street NW  
Washington D.C. 20006

United States

Trade association representing metallic and non-metallic scrap processing firms, brokers and consumers. Promotes public awareness on the advantages of recycling scrap materials and works to minimize economic and institutional barriers to maximum scrap waste utilization. [INST-GUID00109]

**0335 Minerals, Metals & Materials Society**

420 Commonwealth Drive  
Warrendale, Pennsylvania 15086

United States

Professional association dealing with metals and materials. [INST-GUID00037]

**0336 National Association of Solvent Recyclers (NASR)**

1333 New Hampshire Avenue NW  
Suite 1100

Washington, D.C. 20036

United States

Trade association of companies involved in hazardous waste management. [INST-GUID00189]

**0337 National Council of the Paper Industry for Air & Stream Improvement**

260 Madison Avenue  
New York, New York 10016

United States

Professional association, conducting research on environmental effects of forest product processing and publishing reports on this research. [INST-GUID00155]

**0338 National Geophysical and Solar-Terrestrial Data Centre**

30th and Marine Street  
Boulder, Colorado 80302

United States

Responsible for the management of two worldwide databases. Collects, publishes and disseminates information from all over the world. Topics include: air-ocean relationships; astronomy; solar energy; atmosphere. [INST-WFEO00185]

**0339 National Institute for Occupational Safety and Health (NIOSH)**

4676 Columbia Parkway  
Cincinnati, Ohio 45226

United States

Research institute which collects and publishes information about toxicology, toxic and dangerous effects of chemicals (about 83,864 substances). Topics include: drugs; medication; pesticides; plastics; food additives; industrial wastes; detergents; conservatives; toxicology and legislation; rules, laws and policies. [INST-WFEO00186]

**0340 National Technical Information Institute (NTIS)**

5285 Port Royal Road  
Springfield, Virginia 22161

United States

Collects, stores and selectively disseminates information about technology provided by American administration and governmental offices. Topics include: administration; aerodynamics and aeronautics; agriculture and food; astronomy and astrophysics; biology; medicine; chemistry; commerce; economy; management; communication; documentation and information sciences; electro-technology; energy; environment and pollution; civil engineering; engineering; materials; mathematics; navigation; physics; natural resources and earth sciences; health; military sciences; social sciences and behaviour; nuclear sciences and technology; building technology; biomedical technology; urban and regional technology; transportation. [INST-WFEO00187]

**0341 Oak Ridge National Laboratory**

**Toxicology Information Response Center**

Building 2001  
P.O. Box 2008  
Oak Ridge, Tennessee 37831-6050

United States

Provides extensive toxicology information assistance to the scientific, administrative and public communities. [INST-GUID00093]

**0342 Oak Ridge National Laboratory (CDIAC)**

**Carbon Dioxide Information Analysis Center**

MS-6335, Building 1000  
P.O. Box 2008  
Oak Ridge, Tennessee 37831-6335

United States

Information centre funded by the United States Department of Energy in support of the carbon dioxide research programme. Activities center on scientific information

processing as the foundation for government policy in response to changes in atmospheric carbon dioxide. [INST-GUID00115]

**0343 Oak Ridge National Laboratory (BEIA)  
Biomedical and Environmental Information Analysis**

P.O. Box 2008  
Building 2001  
Oak Ridge, Tennessee 37831-6050  
United States

Information service specializing in the development of environmental data bases, analysis and evaluation. Publishes reports on topical subjects. [INST-GUID00022]

**0344 Pittsburgh Energy Technology Center (PETC)**

P.O.Box 10940  
Pittsburgh, Pennsylvania 15236  
United States

Research centre under the Assistant Secretary for Fossil Energy in the United States. Main function is to promote the use of coal fuels in an environmentally sound manner. Implements the United States governments' research programme in fossil fuels, particularly related to coal, and is responsible for the University Coal Research Program, which is a major source of funds for universities and colleges for purposes related to coal. Publishes PETC Review, Techlines and Energizer. [INST-GUID00152]

**0345 Resources Reference System**

Room 521  
316 North 5th Street  
Bismarck, North Dakota 58505  
United States

Provides access to environmental data. Topics include: rivers and ground water; sediment loads and transportation; sedimentation; water and air quality; water resources; control and monitoring; pollution abatement; geology; land use; industrial, urban and agricultural pollution and pollutants; solid and liquid wastes; effluent treatment; sewage; water purification; water supply; soil sciences; meteorology; soil quality; climate change. [INST-WFF:000188]

**0346 Toxicology Information Program**

8600 Rockville Pike  
Bethesda, Maryland 20209  
United States

Collects and stores information about toxic substances produced and used in the world. The centre brings together information from other on-line or published services on toxicology (such as MEDLINE, BIOSIS Review). Topics include: experimental toxicology; clinical toxicology; pollution; analytical toxicology; secondary effects of medication; pharmaceutical production; toxicity of chemicals and drugs on humans and animals; effects of chemicals and pollutants on the environment; hazardous waste; mutagens. [INST-WFF:000189]

**0347 Water Resources Scientific Information Centre**

425 National Center  
Reston, Virginia 22092  
United States

Collects and disseminates local information about water use, quality, supply and pollution. Topics include: all aspects of water conservation, control, use and management problems (including physical and social aspects); water cycle, supply, demand, quality and resources planning; data about water resources; water legislation; rights related to water. [INST-WFF:000190]

**0348 Western Agricultural Chemicals Association (WACA)**

930 G. Street, Suite 210  
Sacramento, California 95814  
United States

Trade association representing the pesticide industry in nine western states of the United States. Aims to promote the safe use of agro-chemical products and to promote the industry through public information activities. [INST-GUID00145]

URUGUAY

**0349 Instituto Nacional para la Preservación del Medio Ambiente**

Luis Cartia 3046  
Montevideo  
Uruguay

Research on natural resources and pollution. Topics include: pollutants; pollution; environment; environmental education. [INST-WFF:000176]

USSR

**0350 Institute for Scientific and Technical Information**

14 Baltijskaya ul.  
125219 Moscow  
USSR

Collects and stores data and provides access to documentation. Topics include: biological resources; non-renewable resources; impact on environment; environmental assessment; environmental education and training; appropriate technologies; environmental management. [INST-WFF:000193]

**0351 Institute of Hydrometeorological Information (VNIIG-MI-MTSD)**

All-Union Scientific & Research Institute of Hydrometeorological Information  
249020 Kaluga District Obninsk  
Koroleva St. 6  
USSR

Research and information centre engaged in hydro-meteorological information and data collecting, data processing and dissemination. Creates large data sets on the

atmosphere, hydrosphere and their components on computer-compatible media. Has competence on air pollution and water pollution, climate change and the greenhouse effect. [INST-GUID00084]

**0352 Institute of Information and Technical Research  
VINITI**

14 Baltijskaya ul.  
125219 Moscow  
USSR

Collection, analysis and dissemination of information (preparing directories and inventories) and research (fundamental and applied). Topics include: soil conservation; soil restoration; land use; herbicides; pesticides; plant diseases; animal diseases; nature conservation; agricultural sciences and techniques; agricultural machinery. [INST-WFF:000192]

**0353 Institute of Scientific Research for Hydrometeorological Information**

14 Baltijskaya ul.  
125219 Moscow  
USSR

Provides data and information analysis, monitors data and forecasts trends. Topics include: water-atmosphere interaction; atmospheric models; atmospheric survey and control; climate change and variations; meteorology; environment and forestry statistics; hydrology; marine survey and control. [INST-WFF:000194]

**0354 Institute of Water Problems**

14 Baltijskaya ul.  
125219 Moscow  
USSR

Collects, analyses and disseminates information and undertakes research. Topics include: artificial drainage systems; watershed management; water erosion; water pollution; water quality; pollution hazards; reservoirs and artificial lakes; sedimentation; hydroelectricity; water resources planning; development planning. [INST-WFF:000195]

**0355 International Centre for Scientific and Technical Information of USSR (VINITI)**

14 Baltijskaya ul.  
125219 Moscow  
USSR

Collects international information, to improve dissemination and access. Topics include: standardization of terminology; development of national information systems; natural resources protection and environmental improvement; socio-economic, scientific, legislative, regulatory and educational aspects; sanitation; radiation; urban development; ecosystems and landscapes; atmospheric pollution; meteorology; noise and vibration control and abatement; municipal, industrial and agricultural wastes; measurements (data) and control (instrumentation) of the environment. [INST-WFF:000196]

**VENEZUELA**

**0356 Sistema Automatizado de Información Científica Tecnológica (CONICIT/SAICYT)**

**Consejo Nacional de Investigaciones Científicas y Tecnológicas**

Apartado de Correos 70617  
Los Ruices  
Caracas  
Venezuela

Collects, indexes, stores and disseminates scientific and technical information. Topics include: petrochemical industry and chemical industry; glass and ceramics; electronics; food technology; forest products processing; environmental protection; environmental impact assessment; natural resources management. [INST-WFF:000197]

**YUGOSLAVIA**

**0357 Scientific and Technological Documentation Centre for Territorial Planning**

**Council for Environment**

**Savezno Izvrsno Vece**

Bulevar Lenjina 2  
11070 Belgrad  
Yugoslavia

Stores and analyses scientific and technical information and data concerning environment. Research activities on communication technologies. Topics include: environmental quality; life conditions; environmental impact; environmental assessment; pollution criteria; pollutants; environmental monitoring, measurements and instrumentation; social and cultural indicators; environmental policy; financial support; regional development. [INST-WFF:000198]

**ZAMBIA**

**0358 Documentation and Scientific Information Centre (DSIC)**

**National Council for Scientific Research**

P.O. Box CH.158  
Chelston  
Lusaka  
Zambia

Collection, analysis and dissemination of information, with emphasis on livestock and pests. Topics include: tree species improvement; pulp and paper industry; building materials and ceramics industry; water resources; environment pollution; food technology; industrial/mineral processing; radioactive isotope research. [INST-WFF:000199]

**0359 Environmental Research Laboratory (NCCER/ERI)**

**National Council for Scientific research**

P.O. Box 158  
Chelston

**Lusaka  
Zambia**

Research on environment. Topics include: pollution control; air pollution monitoring; precipitation quality monitoring; water natural resources; liquid wastes; natural water; industrial and urban waste water treatment; energy from biomass. [INST-WFEO00200]

**ZIMBABWE**

**0360 Leather Institute of Zimbabwe**

**P.O.Box 2324  
Bulawayo  
Zimbabwe**

Professional association maintaining a laboratory and research centre and providing technical assistance and training services. [INST-GU1D00176]

## AFRICA REGION

**0361 Centre de Documentation Pour le Programme de Développement du Bassin du Fleuve Sénégal (CD/OMVS)**

B.P. 383  
Saint-Louis  
Senegal

Collects and disseminates information for improving management of the Senegal river watershed. Topics include: agriculture; forestry; fishery; water and hydro-geology; environment; rural development; industrial development; medicine and rural sociology; hydrology; hydro-agricultural equipment. [INST-WFEO00147]

**0362 Sahelian Documentation Network (RESADOC)**

Sahel Institute  
B.P. 1530  
Bamako  
Mali

Supplies member countries with information and documentation for combatting desertification in their countries. [INST-WFEO00032]

## ASIA/PACIFIC REGION

**0363 Asian Network for Industrial Technology Information and Extension (TECHNET)**

Tanglin  
P.O. Box 140  
Singapore 5124  
Singapore

Provision of information for industry in the Asia/Pacific region. Topics include: appropriate technology and technology transfer; industrial processes and their impact on environment and natural resources; environmental assessment; state-of-the-art, environmental and industrial legislation; training activities; technical information for small scale industry; medium scale industry; standards; legislation; patents; economic growth; preservation of natural resources; pollutants; wastes; industrial emissions. [INST-WFEO00035]

**0364 Environmental Sanitation Information Centre (AIT/ENSIC)**

Asian Institute of Technology  
P.O. Box 2754  
Bangkok 10501  
Thailand

Topics include: fresh water ecosystems biological resources and monitoring; water pollution; water quality; water treatment and purification; watershed management; conservation of freshwater; water reticulation systems; pipelines; sewage treatment systems; drinking water treatment; flocculation; anaerobic processes; brackish water ecosystems. [INST-WFEO00033]

**0365 Pacific Basin Consortium for Hazardous Waste Research (PBCHWR)**

Environment and Policy Institute  
c/o East-West Center  
1777 East-West Road  
Honolulu  
Hawaii 96848  
United States

Association of research institutions, universities, government organizations and private sector companies in the Pacific Basin countries, involved in hazardous waste research. [INST-GUID00149]

**0366 South-Pacific Bureau for Economic Co-operation (SPEC)**

P.O. Box 856  
Suva  
Fiji

Topics include: development aid; information; consulting; trade promotion; financial aid; regional co-operation and industrialization; development planning; economic development; transport; tourism; telecommunications; banana industry; standards for the region; environment; energy; renewable energy; agricultural pests and diseases; harmonization of industrial incentives; investigation of bulk purchasing; shipping. [INST-WFEO00034]

## EUROPE REGION

**0367 Centre of Ecology and Toxicology of the European Chemistry Industry (ECETOC)**

50 Avenue Louise  
Boite 63  
B-1050 Brussels  
Belgium

Topics include: toxicology and eco-toxicology of chemicals. Prepares ECETOC Bulletin. [INST-WFEO00040]

**0368 Commission of European Communities (CEC/DGXIII)**

DGXIII

L 2920 Luxembourg

Maintains inventories of documentation centres on environment (ENDOC) and research on environment in Europe (ENREP). Topics include: policy; information; water, air and soil pollution; food and health; land use and agriculture; water resources; oceans; solid and liquid wastes; chemical wastes; environmental hazards. [INST-WFEO00036]

**0369 Conseil International du Droit de l'Environnement (CIDF)**

Adenauer Allee 214  
05300 Bonn 1  
Germany

Promotion of information exchange on the laws, rules and

regulations, administrative aspects and policies in the field of environment. [INST-WFEO00038]

**0370 European Bureau of Environment (EEC/BEE)**

European Economic Community

31 Vautierstraat

B-1040 Brussels

Brabant

Belgium

Liaison-Bureau and Spokesman of environmental defense organizations for institutions in the European Community. Also informs its members about the activities of these institutions. Prepares recommendations for submission to competent authorities and promotes improvements to the quality of life, protection and conservation of the environment. Has research activities and co-ordinates activities in environmental research. Topics include: ecosystems; natural resources and environment; action groups; environmental policy; environmental protection; environmental programmes. [INST-WFEO00041]

**0371 European Centre of Information for Nature Conservation  
European Council**

B.P. K6

67006

Strasbourg

France

Collection and dissemination of information related to natural state of the environment. Looks for solutions to environmental problems. Topics include: ecology; ecosystems; endangered species; human activities and environment; legislation; standards. [INST-WFEO00042]

**0372 European Council of Federations in the Chemistry  
Industry (CEFIC)**

Documentation Centre

Av. Louise 250

Boit 71

B 1050 Brussels

Belgium

Study of problems related to the chemical industry, and international collaboration in Europe (scientific, technical and documentary aspects). Topics include: international trade in chemicals; environment and health; distribution and transport; energy and materials. [INST-WFEO00039]

**0373 Group for the Development of the European Market of  
Information (CEC)**

Commission of the European Communities

177 Route d'Esch

L. 14-71 Luxembourg

Development and stimulation of a European market and industry for information. Topics include: information means; directories; inventories; bibliographic references; data bases; and their producers; European systems of access; information

referral systems, with names, addresses, organization types, holdings, dates, scopes and fields of interest. [INST-WFEO00043]

**0374 Oil Companies International Study Group for Conservation of Clean Air and Water - Europe (CONCAWE)**

Documentation Centre

Van Hoghenoucklaan 60

2596 te 's-Gravenhage

Netherlands

Scientific research into environmental aspects of the oil refining industry. Topics include: environmental R & D programmes & policy; health; occupational safety; emissions; air pollution; waste substances; incineration; water pollution; waste gas cleaning; standards; economic aspects. [INST-WFEO00037]

**0375 Research Centre of the European Communities  
(CEC/ISPRA)**

21020 Ispra

Varese

Italy

Responsible for chemical information. Data is extracted from primary literature, data directories and inventories, published and unpublished information sources. Disseminates information on compound identification, nomenclature, synonyms, registers using CAS number. Topics include: chemical structure; economy (production processes, capacity, statistics); analytical methods (biological and ecological indicators); use, health and safety; toxicology (human, animal, micro-organisms); influence of chemicals on environment and health; physical and chemical properties; production methods; evaluation of real and potential hazards related to production and/or use of chemicals; ecological and economic impacts; long-term effects on environment. [INST-WFEO00045]

**NORTH AMERICA REGION**

**0376 Centre for International Environment Information  
(CIEI)**

300 E 42nd Street

New York, New York 10017

United States

Helps inform the public about environmental problems in the United States and Canada. [INST-WFEO00046]



**0378 Economic Commission for Latin America and the Caribbean (ECLAC/CLADES)**

**Latin American Centre for Economic and Social Documentation**

P.O. Box 179-D  
Avenida Dag Hammarskjöld  
Santiago  
Chile

Provides information needed for sustainable socio-economic development in South American countries. Topics include: economic development; social development; economic planning; social planning; regional development; development aid; development planning; environment; natural resources management; documentation; library sciences; information sciences. [INST-WFEO00017]

**0377 Economic and Social Commission for Asia and the Pacific (ESCAP)**

**Administration Division**

**Library**

United Nations Building  
Rajadamnern Avenue  
10200 Bangkok  
Thailand

Provides information about environment to promote integration of such considerations in economic and R&D development projects. Topics include: economic development; development planning; agricultural development; food; industrial development; international trade; labour; social services; social development; transport; natural resources; energy. [INST-WFEO00015]

**0379 Food and Agriculture Organization of the United Nations (FAO/AGRIS)**

**Department of General Affairs and Information**

**International Information System for the Agricultural Sciences and Technology**

Via delle Terme di Caracalla  
00100 Rome  
Italy

Responsible for world-wide information on agriculture, its technology, inputs, outputs, production means, products, environmental effects, socio-cultural elements and economy. Topics include: agriculture; forestry; fishery industry; aquaculture; food; human nutrition; pollution; energy resources; agricultural engineering; economics; rural development; home economics; administration, research and education; natural resources; animals; crops; plants. [INST-WFE:000011]

**0380 International Labour Organisation (ILO/CIS)**

**International Occupational Safety and Health Information Centre**

4 route des Morillons  
CH-1211 Geneva 22

**Switzerland**

Provides information on occupational safety and health in working conditions. Topics include: occupational medicine; ergonomics; safety; safety education; toxicology; air pollution; noise abatement; wastes; risks; pathology; industrial toxicology; accident prevention; fires and explosions; chemicals; statistics; legislation; control; industries and professions. [INST-WFEO00009]

**0381 International Maritime Organization (IMO)**

**Library**

4 Albert Embankment  
London SE1 7SR  
United Kingdom

Promotes international co-operation for sea transport with main concerns being safety and pollution control. In addition to a number of international conventions, IMO has adopted several hundred recommendations on a wide range of subjects. Other areas of work include training, technical assistance to developing countries, legal aspects and liability issues and the facilitation of maritime traffic. Information covers: world seas and oceans (environment, use, trends); sea transport; maritime law; ships; cargo; shipbuilding; ports; pollution control, monitoring, abatement; risks; coastal erosion; fisheries; vocational training. [INST-GUID00106]

**0382 Pan American Health Organization (PAHO)**

**Documentation and Health Information Center**

Gamboa Carlos  
525 23rd Street  
Washington, D.C. 20037  
United States of America

Intergovernmental organization engaged in research on public health and sanitation problems primarily concerned with environmental health, disease control, health services, epidemiological surveillance, family health and nutrition. Has a documentation and health information centre. [INST-GUID00005]

**0383 Pan American Health Organization (PAHO/CEPIS/REPIDISCA)**

**Centre for Sanitary Engineering and Environmental Sciences**

**Pan American Network for Information and Documentation in Sanitary Engineering and Environmental Sciences**

Casilla 4337  
Lima-100  
Los Pinos 259  
Urbanizacion Camacho  
Lima 3  
Peru

Deals with information on sanitary engineering and environmental sciences (especially related to public health and welfare). Topics include: water pollution; water supply; waste management; environmental engineering; waste water treatment and re-use; water purification. [INST-WFE:000018]

**0384 United Nations Centre for Human Settlements (UNCHS)**

Information, Audio-Visual and Documentation Division  
Documentation Service

P.O. Box 30030  
Nairobi  
Kenya

Promotes co-operation and research for balanced development of human settlements. Topics include: the human habitat; housing; land use; transport; squatters; construction techniques; low-cost housing; rural development; training; construction industry; institutions and management; infrastructure. [INST-WFE:00008]

**0385 United Nations Development Programme (UNDP/INRES)**

Special Unit for Technical Co-operation Among Developing Countries

Information Referral System  
One United Nations Plaza  
New York, New York 10017  
United States

Helps developing countries through R&D projects and technical co-operation. Topics include: TCDC; training; research centres; development aid; research and development; social development; economic development; consultants; experts. [INST-WFE:00007]

**0386 United Nations Environment Programme (UNEP)**

Office of the Environment Programme  
Library and Documentation Centre

P.O. Box 30552  
Nairobi  
Kenya

Provides information about environmental subjects related to UNEP programmes around the world. Topics include: climate; ecology; biosphere; energy resources; remote sensing; natural disaster; desertification; arid zone; environmental management, policy, engineering, education, protection and legislation; food; agriculture; soil conservation; water resources; fishery conservation; marine environment; waste management; nature conservation; air and water quality; endangered species; appropriate technology. [INST-WFE:00002]

**0387 United Nations Environment Programme (UNEP/GEMS)**

Office of the Environment Programme  
Global Environment Monitoring System

P.O. Box 30552  
Nairobi  
Kenya

Responsible for research and co-ordination of environmental monitoring and related data bases. Co-ordinates the collection, analysis, handling and evaluation of specific environmental data, with regard to the state of the environment in an

evolutionary time-frame. Topics include: pollution; climate; weather; natural resources; land use; forests; fires; urbanization; past trends and prospects; built-up areas; urban climate and air pollution; effects on the environment; remote sensing; ecosystems; physical geography; demography; resources evaluation. [INST-WFE:00005]

**0388 United Nations Environment Programme (UNEP/IED)**

Office of the Environment Programme  
Industry and Environment Office  
Documentation Service

Tour Mirabeau  
39-43 Quai André Citroën  
75739 Paris Cedex 15  
France

Promotes the transfer of information and sharing of experience to facilitate technology transfer and implementation of practices to safeguard the environment. Topics include: pollution control; environmental effects and management; pollutants; clean technologies; industrial wastes; hazardous wastes; industrial areas; air pollution; water pollution; legislation and regulations on environment; urban areas; appropriate technology; standards; patents. [INST-WFE:00003]

**0389 United Nations Environment Programme (UNEP/INFOTERRA)**

INFOTERRA Activity Centre

P.O. Box 30552  
Nairobi  
Kenya

Topics include: provision of lists on sources of information; establishment of contacts with appropriate information suppliers; every subject related to environment, including legislation, statistics, standards, patents. [INST-WFE:00001]

**0390 United Nations Environment Programme (UNEP/IRPTC)**

Office of the Environment Programme  
International Register of Potentially Toxic Chemicals

Palace of Nations  
CH-1211  
Geneva-10  
Switzerland

Maintenance of a global system of partners to develop a data bank with information for assessing environmental effects of chemicals. Topics include: identification of knowledge gaps; chemical hazards; evaluation and control of chemicals in the environment; numerical data; production, use and characteristics of chemicals; laws and regulations; effects on man, living species and natural resources. [INST-WFE:00004]

**0391 United Nations Industrial Development Organization (UNIDO/INTIB)**

Department for Industrial Promotion, Consultations and Technology

Division for Technology Promotion

Industrial and Technology Information Section

Vienna International Centre

P.O. Box 300

Wagramstrasse 5

A-1400 Vienna

Austria

Helps developing countries to choose technology appropriate to their needs. Topics include: industrial development, policy, planning, research and information; development projects; industrial equipment, processes and management; technical information. Information relevant to industrial energy and environment forms part of the Industrial and Technological Information Bank (INTIB). [INST-WFEO00006]

**0392 World Health Organization (WHO)**

Division of Epidemiological Surveillance and Health Situation and Trend Assessment

Global Epidemiological Surveillance and Health Situation Assessment

20 Rue Appia

CH-1211 Geneva 27

Switzerland

Maintains annual statistics relevant to health assessment and study of demographic trends in relation to birth/death (morbidity) rates. Topics include: mortality; causes of death; infectious diseases; medical personnel; hospitals; demographic statistics; health statistics; diseases. [INST-WFI:000010]

**0393 World Health Organizations (WHO/PEPAS)**

Regional Office for the Western Pacific

Western Pacific Regional Centre for the Promotion of Environmental Planning and Applied Studies

P.O. Box 12550

Kuala Lumpur

Malaysia

Promotes environmental health aspects and assessment in the region's economic and development activities. Topics include: pollution control; water supply; sanitation; environmental planning; technical information. [INST-WFE:000016]

**0394 World Meteorological Organization (WMO)**

Research and Development Programme Department

Technical Library

P.O. Box 5

41 Avenue Giuseppe-Motta

CH-1211 Geneva 20

Switzerland

Research and development related to the world climate and meteorology (monitoring, instrumentation, models, control, trends, perspectives). Topics include: atmospheric chemistry,

composition, circulation and monitoring; physics; climatic change and variability; weather and climate monitoring; ozone; weather forecasting; weather modification; meteorology; artificially induced rainfall; air pollution; pollution monitoring; soil contamination; upper atmosphere pollution; water resources; hydrology; oceanography. [INST-WFEO00012]

**0395 World Meteorological Organizations (WMO)**

World Weather Watch Department

Operational Information Service

P.O. Box 5

41 Avenue Giuseppe-Motta

CH-1211 Geneva 20

Switzerland

Information service on meteorology and environment, through a world-wide system of electronically linked centres. Topics include: meteorology; oceanography; pollution; data collection; remote sensing. [INST-WFEO00013]

## DIRECTORIES

**0396 ACCIS Guide to United Nations Information Sources on the Environment**

Information guide on United Nations' environmental activities. (Publisher: United Nations, New York (1988) [in English]. ISBN 9211003393 [BIBL.-GUID00001])

**0397 ACEC Engineering Services Directory for Waste Management**

Directory of engineering companies specializing in waste management (B. Land (Analyst/ed.), American Consulting Engineering Council, Research & Management Foundation, 1015 15th Street, Washington, DC 20005, United States [in English]. [BIBL.-GUID00002])

**0398 Air and Water Pollution- Sources of Information and Bibliography**

Listing of institutions willing and able to supply information on questions relating to air and water pollution. (United Nations Environment Programme, Nairobi, Kenya (1989) [in English]. ISBN 9280712330 [BIBL.-GUID00003])

**0399 Arab Oil and Gas Directory**

(The Arab Petroleum Research Center; Publisher: The Arab Petroleum Research Center, 7 Avenue Ingres, 75016 Paris, France (1986) [in English]. [BIBL.-GUID00004])

**0400 Australian Waste Disposal Catalogue**

Annual directory of equipment, machinery, products and services under seven categories in solid and liquid waste management. (F.H. Schmidt; Publisher: Editorial and Publishing Consultants Pty. Ltd., Australia [in English]. 0726-6987 [BIBL.-GUID00005])

**0401 Belgian Environmental Research Index**

Directory indexing articles and publications on environment, published in Belgium or by Belgian authors. (National Centre for Scientific and Technical Documentation; Publisher: National Centre for Scientific and Technical Documentation, Bd. de l'Empereur 4, B-1000 Brussels, Belgium (1988), Vol. 20 [in English]. [BIBL.-GUID00006])

**0402 Best's Safety Directory**

Directory of manufacturers and distributors of industrial safety, industrial hygiene, security and pollution control products and services. (Publisher: A.M. Best Company Inc., Ambest Road, Oldwick, New Jersey 08858, United States [in English]. [BIBL.-GUID00007])

**0403 Directory of Chemical Waste Transporters**

Annual directory of hazardous waste transportation companies in North America. (J.C. Grady (ed.), Chemical Waste Transportation Council; Publisher: Chemical Waste Transportation Council, National Solid Wastes Management

Association, 1730 Rhode Island Avenue, NW, Suite 1000, Washington, D.C. 20036, United States [in English]. [BIBL.-GUID00009])

**0404 Emergency Response Directory for Hazardous Materials Accidents**

Directory of federal, state and local government agencies, chemical manufacturers and transporters, hot-lines and strike teams, burn care centres, civil defense and disaster centres and other organizations concerned with the containment and cleanup of chemical spills and other hazardous materials accidents. (M. Cicalese (ed.); Publisher: Odin Press, Box 536, New York, New York 10021, United States [in English]. [BIBL.-GUID00017])

**0405 Energy and Environmental Terms: a Glossary**

(P. Brackley, Royal Institute of International Affairs, Policy Studies Institute; Publisher: Gower, Aldershot, United Kingdom (1988) [in English]. 0-566-05759-X [BIBL.-GUID00018])

**0406 Environment Index**

Annual bibliography, indexes the year's articles on the environment (W. Lyons (ed.), EIC - Intelligence Division; Publisher: EIC - Intelligence Division, 245 W. 17th St., New York, New York 10011, United States (1970-) [in English]. 009-791X [BIBL.-GUID00019])

**0407 Essential Publications on Occupational Safety and Health**

(International Labour Organisation; Publisher: I.L.O. Geneva, Switzerland (1988) [in English]. [BIBL.-GUID00020])

**0408 Essential Whole Earth Catalogue**

Handbook combining the approaches of a directory, a bibliography and a topical survey, focusing on ecology in 10 major sections. (J. Baldwin (ed.), Point; Publisher: Doubleday & Company, Inc., 245 Park Avenue, New York, New York 10167, United States (1986) [in English]. [BIBL.-GUID00021])

**0409 Directory of Federal Contacts on Environmental Protection**

Directory of United States federal government agencies engaged in some aspect of environmental protection. (P. Murray, Navy Energy and Environmental Support Activity; Publisher: Naval Energy and Environmental Support Agency, Navy Environmental Support Office, Department of the Navy, Department of Defence, Port Hueneme, California 93043, United States [in English]. [BIBL.-GUID00010])

**0410 Film and Video Catalogue - Images of the Environment**

A list of films and videos on environmental matters that can be obtained from UNEP on a free loan basis for educational, non-commercial and non-profit making purposes. (United Nations Environment Programme, Audio Visual Unit,

Nairobi, Kenya [in English]. [BIBL.-GUID0022])

**0411 Directory of Hazardous Waste Services**

Annual directory of hazardous waste services. (W.M. Glenn, D. Orchard(ed.)); Publisher: Corpus Information Services, Division of Southam Communications Ltd., 1450 Don Mills Road, Don Mills, Ontario M3B 2X7, Canada [in English]. [BIBL.-GUID00011])

**0412 Hazardous Waste Services Directory**

Directory of firms providing services related to the handling of dangerous materials, including haulers, processors, disposal sites, operators, laboratories and consultants. Part of the "Toxic and Hazardous Substances Guide" series. (G. McDowell (ed.)); Publisher: J.J. Keller & Associates, Inc., 145 Wisconsin Avenue, Neenah, Wisconsin 54956, United States [in English]. [BIBL.-GUID00023])

**0413 Industrial and Hazardous Waste Management Firms**

Directory of waste-handling facilities, transport firms, spill response firms, incineration ships, PCB-detoxification, mobile solvent-recovery services, emergency response teams. Includes summary of United States' regulatory programmes. (Publisher: Environmental Information Ltd., Environmental Engineering and Management Ltd., 7400 Metro Boulevard, Minneapolis Minnesota 55435, United States [in English]. [BIBL.-GUID00024])

**0414 INFOTERRA International Directory of Sources**

Directory with a companion subject index. A catalogue of general environmental information sources selected and registered by government-designated INFOTERRA national focal points. Each has agreed to respond to request for information on a range of environmental topics. (Publisher: United Nations Environment Programme, Nairobi, Kenya (1987) [in English]. [BIBL.-GUID00025])

**0415 International Leather Guide**

International directory of the leather industry, with related sectors, such as research institutions, technology centres, information services, professional organizations etc. (D. Muggleton (Publishing Director)); Publisher: Benn Business Services Ltd., P.O. Box 20, Sovereign Way, Tonbridge, Kent TN9 1RO, United Kingdom (1990) [in English]. 0 86382 083 2 [BIBL.-GUID00026])

**0416 International Pollution Control Directory: Eco-Technics**

World-wide directory of manufacturers and service organizations concerned with pollution control related to water pollution, air pollution, solid waste, noise and vibration. (Publisher: ECO-Verlags AG, Switzerland [in English]. [BIBL.-GUID00027])

**0417 International Registry of Chemicals Currently being Tested for Toxic Effects (CCTTE)**

Computerized listing of chemicals being tested for toxic effects. (International Programme on Chemical Safety, Geneva, Switzerland (1988) [in English]. [BIBL.-GUID00028])

**0418 IWED Guide to Waste Equipment Distributors**

Directory of distributors of waste equipment, including hazardous waste and resource recovery equipment in North America. (J.C. Grady (ed.)). Institute of Waste Equipment Distributors; Publisher: Institute of Waste Equipment Distributors, National Solid Waste Management Association, 1730 Rhode Island Avenue, N.W., Suite 1000, Washington, D.C. 20036, United States [in English]. [BIBL.-GUID00029])

**0419 Directory of National Environmental Organizations**

International directory of nongovernmental organizations concerned with the environment and conservation. (J.C. Brainard, R.N. McGrath(ed.)); Publisher: United States Environmental Directories, Box 65256, St. Paul, Minnesota 55265, United States [in English]. [BIBL.-GUID00012])

**0420 National Society for Clean Air - Members' Handbook**

Handbook, listing manufacturers of equipment, consultants and organizations involved air pollution control, in the United Kingdom and overseas. Includes the Society's annual report and guide to relevant films and filmstrips. (P. Gilbert (ed.)). National Society for Clean Air; Publisher: National Society for Clean Air (NCSA), 136 North Street, Brighton, BN1 1RG, United Kingdom [in English]. 0140-6787 [BIBL.-GUID00030])

**0421 Directory of Pollution Control Equipment Companies in Western Europe**

(Publisher: European Directories, 23, City Road, London EC1Y 1AA, United Kingdom [in English]. 0 906685 01 X [BIBL.-GUID00013])

**0422 Pollution Engineering - Environmental Yearbook and Product Reference Guide Issue**

Annual directory of manufacturers of pollution control equipment for air, water and noise pollution control and for solid and liquid waste disposal. (R.A. Young (ed.)); Publisher: Pudvan Publishing Company, Inc., 1935 Shermer Road, Northbrook, Illinois 60062, United States [in English]. [BIBL.-GUID00031])

**0423 Pollution Equipment News - Catalogue and Buyer's Guide Issue**

Annual directory of manufacturers of pollution control equipment and products. (D.C. Lavender (ed.)); Publisher: Rimbach Publishing, Inc., 8650 Babcock Boulevard, Pittsburgh, Pennsylvania 15237, United States [in English]. [BIBL.-GUID00032])

**0424 Pollution Equipment News - Hazardous Wastes Management Reference Directory Issue**

Annual directory of hazardous waste management contractors, consultants and contract analytical laboratories. The material in this reprint also appears in the October issue of the journal "Pollution Equipment News". (D.C. Lavender (ed.). Publisher: Rimbach Publishing, Inc., 8650 Babcock Boulevard, Pittsburgh, Pennsylvania 15237, United States [in English]. [BIBI.-GUID00033])

**0425 Directory of Principal Governmental Bodies Dealing with the Environment**

Directory listing the official designation, address, telephone and telex numbers for the principal government bodies dealing with the environment in 155 countries around the world. (United Nations Environment Programme, Nairobi, Kenya (1990) [in English]. [BIBI.-GUID00014])

**0426 Directory of State Environmental Agencies**

Directory listing the responsibility of individual state programmes in the United States. (T. Henderson, K. Hubbert, ed.). Environmental Law Institute; Publisher: Environmental Law Institute, 1616 P Street, NW, Suite 200, Washington, D.C. 20036, United States (1985) [in English]. 0733-6128 [BIBI.-GUID00015])

**0427 Dictionary of Terms Used in the Safety Profession**

(S.A. Abercrombie, American Society of Safety Engineers, Des Plaines, Illinois, United States (1988) [in English]. 0-93874-79-2 [BIBI.-GUID00008])

**0428 Directory of Waste Equipment Manufacturers**

Directory of manufacturers of waste handling, collection and processing equipment. (J.C. Grady (Communications Editor), Waste Equipment Manufacturers Institute; Publisher: Waste Equipment Manufacturers Institute (WEMI), National Solid Waste Management Association, 1730 Rhode Island Avenue NW, Suite 1000, Washington, D.C. 20036, United States [in English]. [BIBI.-GUID00016])

**0429 Who Makes Machinery and Plant (Wer baut Maschinen)**

Directory of manufacturers of industrial machinery and equipment in Germany. Various indices. Advertisements. (German Machinery and Plant Manufacturers Association; Publisher: Hoppenstedt Wirtschaftsverlag GmbH, Postfach 3026, Havelstrasse 9, D-6100 Darmstadt 1, Germany (1990) [in German, English]. [BIBI.-GUID00035])

**0430 Workbook**

Quarterly. Directory information on organizations in environmental and political fields etc. (J. Jacoby (ed.), Publisher: Southwest Research and Information Center, 105 Standard St., Albuquerque, New Mexico 87106, United States (1974) [in English]. 0195-4636 [BIBI.-GUID00036])

**0431 The World Directory of Environmental Expertise**

Includes sections on major environmental databases and database-hosts suitable for environmental queries, and other major sources of environmental information. (United Nations Environment Programme, Nairobi, Kenya (1987) [in English]. ISBN 9280711520 [BIBI.-GUID00034])

**0432 World Environment Handbook - a Directory of Government Natural Resource Management Agencies and Non-Governmental Environment Organizations in 145 Countries**

Worldwide directory of government agencies concerned with national parks, energy, agriculture, water resources and related areas; and of nongovernmental environmental organizations. (M. Baker, I. Bassett, A. Ethlington (ed.), World Environment Center; Publisher: World Environment Center, 605 Third Avenue, Suite 1700, New York, New York 10158, United States [in English]. [BIBI.-GUID00037])

**0433 World Environmental Directory, North America**

General directory of manufacturers, consultants, professional services, public and private institutions, environmental officials, attorneys, educational institutions, international organizations and data bases in the environmental field in North America. Later editions are expected to cover all industrialized countries. (B.F. Gough (Editorial Director); Publisher: Business Publishers, Inc., Silver Spring, Maryland, United States (1990) [in English]. 0-916742-05-9 [BIBI.-GUID00038])

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Annual world-wide directory of suppliers and products in the waste disposal industry. (B. Wolpin (ed.); Publisher: Communication Channels, Inc., 6255 Barfield Rd., Atlanta, Georgia 30328, United States [in English]. [BIBI.-GUID00039])

## HANDBOOKS

**0435 2,4-Dichlorophenoxyacetic acid (2,4-D) - Environmental Aspects**

One of a series of studies on environmental effects of chemicals. (International Programme on Chemical Safety, Publisher: World Health Organization, Geneva, Switzerland (1989) [in English]. 92-4-154284-5 [BIBI.-GUID00040])

**0436 A Climate of Crisis - Global Warming and the Island South Pacific**

Global warming and the cultural and physical existence of societies in the South Pacific. This book looks at the problems of the ozone layer. (Peter Hulm, Association of South Pacific Environmental Institutions, UNEP South Pacific Regional Environment Programme, Publisher: Association of South Pacific Environmental Institutions (1989) [in English]. [BIBI.-GUID00041])

**0437 A Survey of Information Systems on OECD Member Countries Covering Accidents Involving Hazardous Substances.**

Covers: industrial accidents; hazardous materials; information systems. (Organisation for Economic Co-operation and Development, Paris, France (1989) [in English]. [BIBL-GUID00042])

**0438 Acceptable Risk? - Making Decisions in a Toxic Environment.**

Discussion, illustrated by case studies, of how crucial decisions in environmental crises are influenced by irrational elements, particularly because of insufficient crisis management systems in public and private sector. Environmental policy; United States of America. (Lee Clarke; Publisher: University of California Press, Berkeley, California, United States (1989) [in English]. 0-520-06303-1 [BIBL-GUID00043])

**0439 Accidental Chemical Releases and Local Emergency Response: Analysis Using the Acute Hazardous Events Data Base**

Covers: industrial accidents; chemical accidents; emergency planning. (James Cummings-Saxton, Samuel J. Ratick, Frederick W. Talcott, Amsterdam, Netherlands (1988) [in English]. ISSN 09218106 [BIBL-GUID00044])

**0440 Action on Ozone**

Explains threats to the ozone layer and steps being taken to prevent an emergent problem reaching crisis point. (United Nations Environment Programme, Nairobi, Kenya (1989) [in English, French, Spanish]. [BIBL-GUID00045])

**0441 Action on the Environment - the Role of the United Nations**

This booklet provides information about what the United Nations is doing about dangers such as warming of the atmosphere and sea level rise, the destruction of forests and the depletion of the ozone layer. (Lloyd Timberlake (1989) [in English]. ISBN 9280712101 [BIBL-GUID00046])

**0442 Agricultural and Environmental Policies**

(Organisation for Economic Co-operation and Development, Paris, France [in English]. 92-64-13127-2 [BIBL-GUID00047])

**0443 Allied-Signal Pursues a Programme of Environmental Assurance.**

Environmental auditing, industrial plants, industrial safety, pollution control, policies. (Jonathan Plaut, France (1988) [in English]. [BIBL-GUID00048])

**0444 Apell - Awareness and Preparedness for Emergencies at Local Level - a Process for Responding to Technological Accidents**

Designed to create community awareness of possible hazards

within the community. Working in co-operation with non-governmental organizations and international organizations and industry. (United Nations Environment Programme; Publisher: UNEP/IEO, Paris, France (1988) [in English]. ISBN 9280711830 [BIBL-GUID00049])

**0445 Asbestos in the Natural Environment**

(H. Schreier; Publisher: Elsevier, Amsterdam, Netherlands (1989) [in English]. 0-444-41696-X [BIBL-GUID00050])

**0446 Biogeochemistry of Metals Manual**

Considers the theoretical and applied aspects of bio-geo-technology of metals; micro-organisms, active in leaching metals from ores, methods of their isolation and cultivation. (United Nations Environment Programme, United Nations Educational, Scientific and Cultural Organization; Publisher: Centre of International Projects, Moscow, USSR (1988) [in English]. [BIBL-GUID00051])

**0447 Biological Waste Water Treatment in the Finnish Pulp and Paper Industry**

Covers: pulp and paper industry; waste water treatment; biological treatment; anaerobic lagoons; activated sludge process; anaerobic digestion; trickling filter. (Reijo Saunamaki, Finland (1989) [in English]. [BIBL-GUID00052])

**0448 Carbon Dioxide Emissions in a Methane Economy**

(J.H. Ausubel, A. Gruebler, N. Nakicenovic, International Institute for Applied Systems Analysis, Laxenburg, Austria (1988) . IIASA-RR-88-7 [in English]. [BIBL-GUID00053])

**0449 Chemie in Kinderzimmer**

Covers: household goods; chemicals in children's rooms; consumers. (Friege, Frank, Haese, Greenpeace; Publisher: Verlag Rowohlt, Germany [in German]. [BIBL-GUID00054])

**0450 Chemie in Lebensmitteln**

Covers: chemical food additives and the food industry. (Katalyse-Umweltgruppe Koeln e.V.; Publisher: Verlag Zweitausendeins, Germany [in German]. [BIBL-GUID00055])

**0451 Chlorine Safety Pays: an Overview of the Hazards and Safe Practices**

Covers: chemicals; chlorine; toxic substances; protective equipment; emergency plans. (World Environment Center, United States (1988) [in English]. ISBN 0910499071 [BIBL-GUID00056])

**0452 Selected Topics on Clean Technology**

Low- and non-waste technology; waste minimization; waste management. (S. Vigneswaran, T. Mino, C. Polprasert, Bangkok, Thailand (1989) [in English]. [BIBL-GUID00143])

**0453 Cleaning Up: US Waste Management Technology and Third World Development**

(J. Elkington, J. Shofley, World Resources Institute; Publisher: World Resources Institute, P.O.Box 620, Holmer, Pennsylvania 19043, United States [in English]. [BIBL-GUID00057])

**0454 Climate and Energy: the Feasibility of Controlling CO<sub>2</sub> Emissions**

(P.A. Okken, R.J. Swart, S. Zwerver; Publisher: Kluwer, Dordrecht, Netherlands (1989) [in English]. 0-7923-0520-5 [BIBL-GUID00058])

**0455 Climate Change: Meeting the Challenge**

Covers: the earth's atmosphere; greenhouse effects; climatic changes. (Commonwealth Group of Experts, United Kingdom [in English]. [BIBL-GUID00059])

**0456 CO<sub>2</sub> and Climatic Change**

(I.M. Smith, IEA Coal Research; Publisher: IEACR, London, United Kingdom (1988) [in English]. 92-9029-157-5 [BIBL-GUID00060])

**0457 Compendium on low- and non-waste technology.**

Series of studies on a variety of cleaner industrial production methods and processes - low- and non-waste technology. (United Nations Economic Commission for Europe, Geneva, Switzerland (1988) [in English]. [BIBL-GUID00063])

**0458 Control Systems for the Introduction of Chemical Substances for Use in the Steel Industry**

Covers: chemicals in the iron and steel industry; occupational safety and health; working environment, workers and exposure; information systems. (International Iron and Steel Institute, Brussels (1988) [in English]. [BIBL-GUID00064])

**0459 Daten zur Umwelt, 1988-89**

Covers environmental statistics for Germany. (Umweltbundesamt; Publisher: E. Schmidt, Berlin, Germany (1989) [in German]. 3-503-02789-0 [BIBL-GUID00065])

**0460 DDT and its Derivatives: Environmental Aspects**

(International Programme on Chemical Safety (IPCS); Publisher: World Health Organization, Geneva, Switzerland (1989) [in English]. 92-4-154283-7 [BIBL-GUID00066])

**0461 Der Oeko-Knigge**

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**0462 Design of an Air-Pollution Monitoring Network**

(W.G. Mueller, International Institute for Applied Systems Analysis; Publisher: IIASA, Laxenburg, Austria (1988) [in English]. [BIBL-GUID00068])

**0463 Disposal of radioactive and other hazardous wastes**

Covers: hazardous waste; radioactive wastes; waste disposal; waste management (R. Boge, C. Bergman, S. Bergvall, Sweden (1989) [in English]. ISBN 9138103141 [BIBL-GUID00069])

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**0465 Emergency Planning for Industrial Crisis: an Overview**

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**0466 Emission Controls in Electricity Generation and Industry**

(International Energy Agency; Publisher: Organisation for Economic Co-operation for Development, Paris, France (1988) [in English]. 92-64-13185-X [BIBL-GUID00073])

**0467 Environment in Asia**

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Covers: petroleum industry; environmental protection; legislation; regulations; guidelines; handbooks. (Canadian Petroleum Association, Canada (1989) [in French, English]. [BIBL-GUID00079])

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**0473 Environmental Guidelines Survey**

An analysis of environmental procedures and guidelines governing development aid. (Environmental Resources Limited, United Kingdom (1988) [in French, English]. [BIBL.-GUID00081])

**0474 Environmental Health Criteria**

Series on environmental health in relation to toxic substances, exposure and health effects of a variety of chemicals. A companion series is entitled 'Health and Safety Guide for...', again covering a variety of chemicals. (Publisher: World Health Organization, Switzerland (1988) [in English]. ISBN 0916468852 [BIBL.-GUID00083])

**0475 Environmental Impact Assessment (EIA) - Basic Procedures for Developing Countries**

A formal study used to predict the environmental consequences of a proposed major development project. (United Nations Environment Programme Regional Office for Asia and the Pacific (1988) [in English]. [BIBL.-GUID00089])

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**0477 Environmental Impacts of Renewable Energy**

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**0479 Environmental Policies in Finland**

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**0481 Evaluating Environmental Impact Assessment: an Action Prospectus/Étude de l'Évaluation des Impacts Environnementaux: Programme d'Action**

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**0482 Evaluation of Air Pollution Pressure through Pine Needles Analyses and Mapping**

Describes a method to map air pollution through analysis of the content of sulphur, fluorine compounds and heavy metals in the needles of scots pines. The conclusion is that the method gives a good picture of the distribution of air pollution and that it can be used to produce maps on different scales. (Polish Academy of Sciences; Publisher: Botanical Garden, Warsaw, Poland (1988) [in English]. [BIBL.-GUID00096])

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Pilot study monitoring exposure to heavy metals i.e., lead and cadmium among small groups of women in China, Japan, Sweden, and Yugoslavia. (WHO, UNEP Human Exposure Assessment Location (HEAL) Programme; Publisher: United Nations Environment Programme, Nairobi, Kenya (1990) [in English]. [BIBL.-GUID00097])

**0484 Factors Affecting Forest Decline: Collection of Publications from the Department of Environmental Conservation**

(Helsingin yliopisto, Ympäristösuojelun laitos, Helsinki, Finland (1988) [in English]. [BIBL.-GUID00098])

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gineers. Center for Chemical Process Safety; Publisher: AICE, New York, New York, United States (1988) [in English]. 0-8169-0400-6 [BIBL-GUID00102])

**0490 Guidelines for the Baltic Monitoring Programme for the Third Stage**

Introductory chapters cover: physical and chemical determinants in sea water; harmful substances in biota and sediments; biological determinants. (Baltic Marine Environment Protection Commission; Publisher: BMEPC, Helsinki, Finland (1988) [in English]. [BIBL-GUID00103])

**0491 Guidelines for Vapor Release Mitigation**

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**0492 Haushalt ohne Chemie**

Covers: chemicals and pollutants in household goods; consumers. (B.Burger; Publisher: Dreisam-Verlag, Germany [in German]. [BIBL-GUID00105])

**0493 Principles of Hazardous Materials Management**

Covers: environmental health; risk assessment; toxic substances; United States. (R.D. Griffin; Publisher: Lewis, Chelsea, Michigan, United States (1988) [in English]. 0-87371-145-9 [BIBL-GUID00140])

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(H.M. Freeman; Publisher: McGraw-Hill, New York, New York, United States (1989) [in English]. 0-07-022042-5 [BIBL-GUID00145])

**0496 Hazardous Waste: Detection, Control, Treatment**

Covers: hazardous wastes; waste disposal; waste management; industrial waste treatment. (Richard Abhou, Ferenc Antoni, Friedhelm Korte, Amsterdam, Netherlands (1988) [in English]. [BIBL-GUID00108])

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Covers: environmental technology; waste treatment and minimization. (John Richmond, Canada (1989) [in English]. ISBN 0772958513 [BIBL-GUID00110])

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Survey and assessment of attitudes in Indian industry toward pollution control and waste management - in particular toward innovative approaches. (P. Modak, P. Khanna, Centre for Environmental Science and Engineering, Indian Institute of Technology, Bombay; Publisher: Centre for Environmental Science and Engineering, Powai, Bombay 400076, India (1987) [in English]. [BIBL-GUID00111])

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Covers: food additives; food industry. (Kapfelsperger, Pollmer; Publisher: Verlag Kiepenhauer & Witsch, Germany [in German]. [BIBL-GUID00113])

**0503 Krebswelt**

Covers: environmental health; pollutants. (E. Koch; Publisher: Verlag Kiepenhauer & Witsch, Germany [in German]. [BIBL-GUID00114])

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**0505 Le Ciel Déchiré: Pouvons-Nous Sauver la Couche d'Ozone?**

Covers: the ozone layer; climate changes; chlorofluorocarbons (CFC); carbon dioxide; greenhouse effect. (John Gribbin, France (1988) [in French]. [BIBL-GUID00116])

**0506 Lead: Environmental Aspects**

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**0507 Learning from Accidents in Industry**

Covers: industrial accidents; chemical industry. (Trevor A. Kletz, London, United Kingdom (1988) [in English]. ISBN 0408-02696-0 [BIBL-GUID00118])

**0508 Local Preparedness for Chemical Accidents**

Covers: industrial accidents; chemical accidents; emergency planning; United States; communities; management. (Wolpert, Amsterdam, Netherlands (1988) [in English]. [BIBL-GUID00119])

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Covers: industrial siting; industrial plants; hazards; urban development; industrial siting; safety measures; accident prevention. (Tanneguy Languereau, France (1988) [in French]. [BIBL-GUID00120])

**0510 Managing the Environment - the Greening of European Business**

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**0512 Manual de los Derivados de la Cana de Azúcar**

Covers sugar cane by-products; agricultural wastes. (ICIDCA; Publisher: GEPLACEA, Mexico (1988) [in Spanish]. [BIBL-GUID00123])

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**0516 Noise and the Steel Industry.**

Covers: noise; pollution; occupational safety and health; working environment and workers. (International Iron and Steel Institute, Brussels, Belgium (1988) [in English]. [BIBL-GUID00127])

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**0519 Ozone Crisis: the 15-year Evolution of a Sudden Global Emergency**

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**0521 Pollution Atmosphérique**

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**0523 Polychlorinated Biphenyls (PCB) - Fate and the Effect in the Canadian Environment**

Covers: toxic substances, polychlorinated biphenyls (PCBs); environment effects assessment; data. (W.M.J. Strachan, Canada (1988) [in English, French]. [BIBL-GUID00136])

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**0527 Pulp and Paper Chemistry and Chemical Technology**  
Volume 1 of 4-volume handbook covering the technical fields involved in paper manufacturing. (J.P. Casey (ed.): Publisher: John Wiley & Sons, Inc. 3rd. Ave., New York, New York 10158, United States (1980), Vol. 1 [in English]. 0-471-03175-5 [BIBL.-GUID00212])

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**0534 Sustainable Industrial Development: Interviews**  
Covers: sustainable development; industrial development; resources conservation; environmental management; Canada. (Lucien Bouchard, France (1989) [in English]. [BIBL.-GUID00149])

**0535 Technical Progress on Protecting the Ozone Layer**  
An assessment of the control measures of the 'Montreal Protocol on Substances that Deplete the Ozone Layer'. (United Nations Environment Programme (1989) [in English]. ISBN 9280712470 [BIBL.-GUID00150])

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Flexible and rigid-foams report provides technical information on reductions that can be achieved and by what means, in each of the major use categories. (United Nations Environment Programme (1989) [in English]. ISBN 9280712497 [BIBL.-GUID00151])

**0537 Technical Progress on Protecting the Ozone Layer - Electronics, Degreasing and Dry Cleaning Solvents - Technical Options Report**  
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Report provides the best available information on reductions that can be achieved and by what means in regard to the ozone layer. (United Nations Environment Programme (1989) [in English]. ISBN 9280712519 [BIBL.-GUID00153])

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Expert report on pesticides regulations in the Philippines with special regard to reduction of health hazards (occupational disease) in application. (Keith T. Maddy, UNIDO (1989) [in English]. UNIDO-DP/ID/SER.A/1232 [BIBL-IDA17659])
- 0638 Czechoslovakia. Low-Waste Technology in Selected Chemical Processes. Terminal Report.**  
Final report on low-waste advanced technology in selected chemical processes in Czechoslovakia (reference: energy conservation and pollution control). (Peter Grau, UNIDO (1988) [in English]. UNIDO-DP/ID/SER.B/623 [BIBL-IDA16935])
- 0639 China. Modernization of Copper and Copper Alloy Scrap Processing in Shanghai. Final Report.**  
Final report regarding modernization of copper and copper alloys metal scrap processing (recycling) in Shanghai, China. (UNIDO (1989) [in English]. : : : [BIBL-IDA17785])
- 0640 Iran (Islamic Republic of). Pharmaceutical Industrial Waste Treatment**  
Expert report on treatment of industrial wastes from a pharmaceutical industry in Iran. (B.C. Gautam, UNIDO (1989) [in English]. UNIDO-DP/ID/SER.A/1277 [BIBL-IDA17850])
- 0641 India. Pollution Control Research Institute. Industrial Wastewater Treatment Technology**  
Expert report on wastewater management/treatment technology in India. (Albert Mayer, UNIDO (1988) [in English]. : : : [BIBL-IDA17528])
- 0642 China. Recycling System for Plastic Wastes. Final Report.**  
Final report on plastics waste recycling experience in China (reference: waste utilization). (Vincent Sciascia, UNIDO, (1989) [in English]. : : : [BIBL-IDA1787])
- 0643 Poland. Toxicological and Environmental Aspects of Pesticide Registration**  
Pesticides formulation and application in Poland with special reference to toxicity and environmental aspects of pesticide registration. (Alan Calderbank, UNIDO (1989) [in English]. UNIDO-DP/ID/SER.A/1131 [BIBL-IDA17283])
- 0644 Major Accident Prevention or Mitigation in the Chemical Industry**  
Accident prevention or mitigation in the chemical industry (reference: industrial safety). (UNIDO (1988) [in English]. UNIDO-IO.22 [BIBL-IDA17061])
- 0645 Achieving Sustainable Development: UNIDO Programme on the Environment.**  
UNIDO programme on the environment. (UNIDO (1989) [in English]. UNIDO-IO.30 [BIBL-IDA17555])
- 0646 Activated Carbon from Agricultural Wastes.**  
Production of activated carbon from agricultural wastes. (Christina Ruiz-Cortes, UNIDO (1989) [in English]. : : : [BIBL-IDA17715])
- 0647 India. Air Pollution Control. Technical Report.**  
Expert report on assistance to a pollution control research centre in Hardwar, India, with special attention to air pollution in the Agra area. (Michael Graber, UNIDO (1988) [in English]. UNIDO-DP/ID/SER.A/1052 [BIBL-IDA17005])
- 0648 Applications of In-Line Flocculation-Ultra (Micro) Filtration**  
AIT thesis describing an experimental study on in-line flocculation membrane filtration, focusing on the principles, advantages and applications of the in-line flocculation in cross-flow microfiltration (CFMF). (C.I. Hwang, Asian Institute of Technology; Publisher: Asian Institute of Technology, GPO, Box 2754, Bangkok, Thailand (1989) [in English]. [BIBL-GUID00252])
- 0649 Bacterial Leaching of Copper Ores - the Chilean Experience.**  
Bacterial leaching of copper ores based on experience in Chile (reference: waste utilization). (Jose Tomas Vargas, UNIDO (1988) [in English]. UNIDO-IO.20 [BIBL-IDA16946])
- 0650 Concepts and Methods of Environment Statistics: Human Settlements Statistics**  
(United Nations Department of International Economic and Social Affairs; Publisher: United Nations, New York (1988) [in English]. 92-1-161300-9 [BIBL-GUID00253])
- 0651 Pakistan. Consultation in Environmental Toxicology Related to Pesticides. Technical Report**  
Expert report on environmental toxicology related to pesticides in Pakistan. (Alan Calderbank, UNIDO (1988) [in English]. UNIDO-DP/ID/SER.A/1043 [BIBL-IDA16930])
- 0652 Cost Recovery Charging for Integrated Pollution Control: a Consultation Paper**  
Covers: pollution control; taxes; policies. (Department of the Environment, United Kingdom (1989) [in English]. [BIBL-GUID00254])

**0653 Economic Development with Environmental Management Strategies for Mauritius**

(International Bank for Reconstruction and Development, Washington, D.C., United States [in English]. [BIBL-GUID00255])

**0654 Economic Panel Report**

Economic implications of ozone depletion and technology related to ozone depleting substances. (United Nations Environment Programme; Publisher: UNEP-Ozone Secretariat, Nairobi, Kenya (1989) [in English]. ISBN 9280712462 [BIBL-GUID00256])

**0655 Environment Impact Analysis of the Manufacture of ....(series)**

Series of reports on environmental impact analysis of the manufacture of a variety of chemicals, pharmaceuticals and detergents. (Barna Mezey, UNIDO (1989) [in English]. :::: [BIBL-IDA17820])

**0656 Environment: Illegal Traffic in Toxic and Dangerous Products and Wastes**

(United Nations Department for Development and International Economic Co-operation; Publisher: United Nations, New York (1989) [in English]. [BIBL-GUID00257])

**0657 Environmental Auditing - Technical Report Series No.2**

Summarizes the discussions of the meeting of senior experts in Paris in January 1989 and gives the full text of the presentations made at the meeting; provides case studies of current environmental auditing practices; aims to encourage industry managers to use environmental auditing. (United Nations Environment Programme/Industry and Environment Office; Publisher: UNEP/IEO, 39-43 Quai André Citroën, F-75739 Paris cedex 15, France (1990) [in English]. ISBN 92 807 1253 5 [BIBL-GUID00258])

**0658 Environmental Effects Assessment Report**

Scientific assessment of atmospheric ozone. (United Nations Environment Programme; Publisher: UNEP - Ozone Secretariat, Nairobi, Kenya (1989) [in English]. ISBN 9280712454 [BIBL-GUID00259])

**0659 Environmental Impact Assessment of Industrial Development. A State-of-the-Art Review and a Proposal for UNIDPLAN Activities.**

Final report on assessment of the impact of industrial development on the environment. (Kurt Fedra, UNIDO (1989) [in English]. :::: [BIBL-IDA17337])

**0660 Turkey, Eskişehir Textile Mill Waste Water Treatment Plant. Report on a visit to Turkey to Advise Sumerbank on Industrial Wastewater Treatment**

Expert report on waste water treatment at a textiles factory in

Turkey. (Sorab J. Arcevala, UNIDO (1989) [in English]. :::: [BIBL-IDA17446])

**0661 Egypt. Establishment of a Multipurpose Pesticide Pilot Plant. Findings and Recommendations. Technical Report.**

Expert report concerning operation of a pesticides pilot plant at Kafr el Dawar, Egypt, with special reference to industrial safety and waste disposal. (R. Gardon, UNIDO (1989) [in English]. UNIDO-DP/ID/SERA/1078 [BIBL-IDA17127])

**0662 Syrian Arab Republic. High Level Consultancies and Training. Fertilizer Industry Pollution Control**

Expert report on control of environmental pollution from fertilizer industry in Syrian Arab Republic. (P.E. Des Rosiers, UNIDO (1989) [in English]. UNIDO-DP/ID/SERA/1267 [BIBL-IDA17999])

**0663 China. Fly-ash Utilization in the Construction Industry. Technical Report.**

Expert report on lectures given at a research centre in China regarding fly ash utilization in the construction industry. (D.M. Golden, UNIDO (1988) [in English]. UNIDO-DP/ID/SERA/989 [BIBL-IDA16752])

**0664 Thailand. Advisory Assistance in Formulating a Programme for Waste Oil Recycling. Terminal Report.**

Expert report on formulating a programme for recycling of waste oil in Thailand. (Hjalmar Brundin, UNIDO (1989) [in English]. UNIDO-DP/ID/SER.B/660 [BIBL-IDA17837])

**0665 First Guide for UNIDO Officers in Evaluating the Environmental Impact of Industrial Projects**

Guidance in industrial project evaluation with respect to environmental impact. (UNIDO (1988) [in English]. UNIDO-PPD.76 [BIBL-IDA16781])

**0666 The Industrial Emergency Game**

Handbook for instructors in training programmes regarding industrial emergencies (involving fire, explosion and/or release of toxic materials) of potential danger to the environment (reference: industrial safety). (Jack B. Carmichael, UNIDO (1988) [in English]. UNIDO-PPD.78 [BIBL-IDA16782])

**0667 Low Waste Technologies in Selected Industries**

Appears in IIT's Environmental Sanitation Review no. 27. (S. Vigneswaran, S. Muttamara, K. Sriandakumar, Asian Institute of Technology; Publisher: Asian Institute of Technology, GPO Box 2754, Bangkok, Thailand (1989) [in English]. [BIBL-GUID00260])

**0668 Low-Waste Technology in Selected Chemical Processes**

Chemical industry, chemical wastes, low and non waste technology, pollution control, resource conservation. Refineries petrochemical industry, sulphur, oxides, waste management.

(UNIDO; Publisher: UNIDO, Vienna, Austria (1988) [in English]. [BIBL-GUID00261])

**0669 Algeria. Mercury Cell Restoration Compared with Replacement by Membrane Cells**

Expert report on assistance to a salt electrolysis plant in Algeria, presently using the mercury cell process for the manufacture of chlorine and caustic soda (reference: pollution control). (A.J. Walkley, UNIDO (1988) [in English]. UNIDO-DP/ID/SER.A/982 [BIBL-IDA16747])

**0670 Yugoslavia. Organic Toxic Pollutants. Mission Report**

Expert report on organic toxic pollutants in connection with factory operations in Kosovo, Yugoslavia. (S.C. Wallin, UNIDO (1988) [in English]. :::: [BIBL-IDA17449])

**0671 The Ozone Layer**

Presents scientific evidence about the threat to the ozone layer in particular through air pollution, and describes in non-technical language how environmental models can predict effects such as increased ultraviolet radiation and changing climate. (UNEP Global Environment Monitoring System (GEMS); Publisher: United Nations Environment Programme, P.O. Box 30552, EAK-Nairobi, Kenya (1987) [in English]. [BIBL-GUID00268])

**0672 India. Pollution Control in Boilers**

Expert report on pollution control, research centre in Hardwar, India with special reference to boilers. (J.G. Wain, UNIDO (1988) [in English]. UNIDO-DP/ID/SER.A/1049 [BIBL-IDA16957])

**0673 Proposal for Clean Technology Digest**

Expert report outlining and discussing contents of a proposed "Digest" of industrial pollutants, sources and agents, and of "clean" technology, as an essential part of beneficial technology transfer. (Ernst F. Winter, UNIDO (1989) [in English]. :::: [BIBL-IDA17889])

**0674 The Public and Environment: the State of the Environment**

(United Nations Environment Programme, Nairobi (1988) [in English]. 92-807-1194-6 [BIBL-GUID00269])

**0675 Regional Strategy for Environmental Protection and Rational Use of Natural Resources in ECE Member Countries Covering the Period up to the Year 2000 and Beyond**

(United Nations Economic Commission for Europe; Publisher: United Nations, New York (1988) [in English]. 92-1-116431-1 [BIBL-GUID00263])

**0676 Scientific Assessment of Stratospheric Ozone**

Series dealing primarily with polar zone, global trend model predictions, ozone depletions potential, global warming

potentials of halocarbons, outcome of the alternative fluorocarbon environmental acceptability study (AFEAS) and in-depth evaluation of potential substances controlled under the Montreal Protocol. Part of WMO Global Ozone Research and Monitoring Project Report Series, No. 20 Volumes 1&2. (World Meteorological Organization (1989). Vols. 1&2 [in English]. [BIBL-GUID00264])

**0677 SIPIScope: Environmental Reporting (special issue)**

Special issue of SIPIScope, presenting an overview of today's dominant environmental concerns and launching the International Hot Line for journalists, offering referral to international environmental experts in more than 35 countries. (F. Shapiro (ed.), Scientists' Institute for Public Information - SIPI; Publisher: Scientists' Institute for Public Information - SIPI, 355 Lexington Avenue, New York, New York 10017, United States [in English]. [BIBL-GUID00265])

**0678 India. Software Engineering in Environmental Pollution Control. Technical Report**

Expert report on computer program engineering serving environmental pollution control in India. (Kurt Fedra, UNIDO (1988) [in English]. UNIDO-DP/ID/SER.A/972 [BIBL-IDA16847])

**0679 Solidification of Heavy Metals Using Cement and Rice Husk Ash**

AIT Thesis, exploring the possibility of using ordinary Portland cement and Portland Rice Husk Cement as binders for the stabilization of waste containing heavy metals. (C.L. Chang, Asian Institute of Technology; Publisher: Asian Institute of Technology, GPO, Box 2754, Bangkok, Thailand (1989) [in English]. [BIBL-GUID00266])

**0680 Storage of Hazardous Materials**

Introduces practical guidelines for the safe storage and warehousing of hazardous chemicals and materials. Technical Report Series, 3. (United Nations Environment Programme; Publisher: UNEP/IEO (1990), Vol. 3 [in English]. ISBN 9280712381 [BIBL-GUID00267])

**0681 Syrian Arab Republic. Assistance in Water and Waste Water Treatment in the Food Industry. Part 1. General Section. Final Report**

Final report on improving water supply and effluent treatment in three food industry plants in Syrian Arab Republic (reference: pollution control). (UNIDO, TEH-Projekt, Yugoslavia (1989) [in English]. :::: [BIBL-IDA17864])

**0682 Syrian Arab Republic. Assistance in Water and Waste Water Treatment in the Food Industry. Part 2. Oil and Soap Manufacturing Company, Damascus, Jeremana. Final Report**

Final report on improving water supply and effluent treatment at an edible oils and soap factory in Syrian Arab Republic.

(UNIDO, TEH-Projekt, Yugoslavia (1989) [in English]. ::: [BIBL-IDA17865])

**0683 Tools for Ambient Air Quality Management. Training Series on Environmental Technologies Promotion No. 1**

Air pollution control with special reference to electric power plants and petroleum refineries. (Michael Graber, UNIDO (1989) [in English]. UNIDO-IPCT.88 [BIBL-IDA17627])

**0684 Republic of Korea. Toxicology Research Center. Animal Pathology. Technical Report**

Expert report on animal pathology in Korea R with special reference to toxicity and pollution control. (Ki Poong Lee, UNIDO (1988) [in English]. UNIDO-DP/ID/SERA/953 [BIBL-IDA16595])

**0685 US EPA Shifts Its Priorities to Pollution Prevention**

Low- and non-waste technology; waste minimization; pollution control; policies. (Myles E. Morse, France (1989) [in English]. ISSN 0378 [BIBL-GUID00270])

**0686 Waste Disposal and Water Treatment in Selected Preserved Food Industries in Egypt**

Expert report on waste disposal and water treatment in food industry in Egypt. (Makio Nakashio, UNIDO [in English]. UNIDO-UNIDO/IO/R.250 [BIBL-IDA16910])

**0687 Syrian Arab Republic. Assistance in Water and Waste Water Treatment in the Food Industry. Part 3. Biscuits and Chocolate Factory ("GHRAOUI"), Damascus**

Final report on improving water supply and water treatment at a bakery products and chocolate factory in Syrian Arab Republic. (UNIDO, TEH-Projekt, Yugoslavia (1989) [in English]. ::: [BIBL-IDA17866])

**0688 Syrian Arab Republic. Assistance in Water and Waste Water Treatment in the Food Industry. Part 4. Dreikish Water Filling Factory. Final Report**

Final report on improving water supply and effluent treatment at a mineral water bottling plant in Syrian Arab Republic. (UNIDO, TEH-Projekt, Yugoslavia (1989) [in English]. ::: [BIBL-IDA17867])

**0689 Water Use and Water-Pollution Control: Trends, Policies, Prospects**

(United Nations Economic Commission for Europe; Publisher: United Nations, New York (1989) [in English]. [BIBL-GUID00271])

# **DATABASES**

**0690 Abstract Bulletin of the Institute of Paper Chemistry - PAPERCHEM**

Producer: The Institute of Paper Chemistry  
 File size: 191,000  
 Dates: 1966-  
 Update frequency: Monthly  
 Vendor(s): Dialog

Contains information on pulp and paper industry. Topics include: science; technology; raw materials. [INFO-GUID00169]

**0691 AFEE**

Producer: Association Francaise pour l'Etude des Eaux  
 File size: 58,000  
 Dates: 1970-  
 Update frequency: Monthly  
 Vendor(s): ESA-IRS

Bibliography containing references to literature on water quality and pollution. Subjects covered include: analysis, research and treatment; energy; environment; politics economics and regulations. [INFO-GUID00200]

**0692 AGPAT**

Producer: Chemical Abstracts Service  
 File size: 2,600  
 Dates: 1987-  
 Update frequency: Bi-weekly  
 Vendor(s): STN

Bibliography covering worldwide chemicals and biochemical patents relating to agriculture and pest control. The records contain in-depth substance and subject indexing, and detailed abstracts covering legal aspects and technical information on the patents. [INFO-GUID00027]

**0693 Air/Water Pollution Report**

Producer: Business Publishers, Inc  
 File size: 1,000  
 Dates: 1983-  
 Update frequency: Weekly  
 Vendor(s): NewsNet

Newsletter on air and water pollution. Covers environmental law; pollution control industry news; research and development worldwide. [INFO-GUID00113]

**0694 APII.IT**

Producer: American Petroleum Institute  
 File size: 414,000  
 Dates: 1964-  
 Update frequency: Monthly  
 Vendor(s): STN

Bibliography with worldwide coverage of literature relating to the petroleum and energy industry. Also covers broad sections of chemistry, chemical engineering, process control, corrosion, catalyst, petroleum refining processes, environmental, health and safety matters. [INFO-GUID00028]

**0695 APIPAT**

Producer: American Petroleum Institute  
 File size: 170,000  
 Dates: 1964-  
 Update frequency: Monthly  
 Vendor(s): STN

Patents relating to the petroleum and energy industry of most countries that issue patents. Each document consist of the patent number, application and publication dates, patent owner and index terms. Subjects covered include: environmental health and industrial safety matters and petroleum refinery processes. [INFO-GUID00030]

**0696 AQUALINE**

Producer: Medenham Laboratory  
 Water Research Centre  
 File size: 81,500  
 Dates: 1960-  
 Update frequency: Undefined  
 Vendor(s): Dialog, ESA-IRS

Contains information on: water resource management; treatment and quality; waste management; pollution; waste water, sewerage and sludge; sampling, analysis and monitoring. [INFO-GUID00222]

**0697 Asbestos Information - ASB**

Producer: Universite de Sherbrooke  
 Programme de Recherche sur l'Amiantc  
 File size: 8,000  
 Dates: 1870  
 Update frequency: Quarterly  
 Vendor(s): QI, Systc.ms

Covers all aspects of asbestos including: mining; environmental effects; health and industrial safety. [INFO-GUID00165]

**0698 Biotechnology Equipment - BIOQUIP**

Producer: DECHEMA  
 File size: 1,000min  
 Update frequency: Undefined  
 Vendor(s): STN

Product data base containing information on manufacturers of apparatus and technical equipment and corresponding product information on biotechnology. It contains information on procedures and products, representatives and licenses. Subjects covered include industrial safety technology. [INFO-GUID00035]

**0699 British Non-Ferrous Metals Abstracts - BNF METALS**

Producer: BNF Metals Technology Centre  
 File size: 127,000  
 Dates: 1961-  
 Update frequency: Monthly  
 Vendor(s): Dialog, ESA-IRS

References literature covering the properties, uses and processing of nonferrous metals. Also covers economics;



marketing; technology; energy; environment; effluents. [INFO-GUID00209]

**0700 CASREACT**

Producer: Chemical Abstracts Service  
 File size: 24,000  
 Dates: 1985-  
 Update frequency: Quarterly  
 Vendor(s): STN

Document-based chemical reaction data base with information derived from over 100 journals. It contains both single-step and multi-step reactions. The citations contain bibliographic information; in-depth substance and subject indexing; abstracts. All items may be displayed but not all searched for. [INFO-GUID00032]

**0701 Chemical Abstracts - CA**

Producer: Chemical Abstracts Service  
 File size: 8,230,000  
 Dates: 1967-  
 Update frequency: Bi-weekly  
 Vendor(s): STN

Bibliography covering journals, patents, technical reports, books, conference proceedings and dissertations from all areas of chemistry and chemical engineering worldwide. Documents contain bibliographic and indexing information for searching. [INFO-GUID00031]

**0702 Chemical Industry Notes - CIN**

Producer: Chemical Abstracts Service  
 File size: 630,700  
 Dates: 1974-  
 Update frequency: Bi-weekly  
 Vendor(s): Dialog

Indexing worldwide journals, newspapers and periodicals which reflect recent events in the chemical industry. Principal coverage includes: government and society; market data; products and processes; organizations and institutions; unit cost and price information. [INFO-GUID00016]

**0703 CHI**

Producer: Royal Society of Chemistry  
 File size: 12,000  
 Dates: 1984-  
 Update frequency: Monthly  
 Vendor(s): STN

Contains information on hazards caused by chemicals which are likely to be encountered in chemical industry and related industries. Information on adverse effects to health and safety are included. Subjects covered include: toxicity chemicals, hazardous wastes management and legislation. [INFO-GUID00055]

**0704 Coal Data Bas.**

Producer: IEA Coal Research

File size: 75,000

Dates: 1978-

Update frequency: Monthly

Vendor(s): Belindis, CISTI, INKA, JICST, QL Systems

Covers all areas relevant to coal industry. Subjects covered include: economics; policy and management; mining; transport and handling; coal properties and constitution; waste management; pollution; environmental effects. [INFO-GUID00210]

**0705 Coal Research Projects Data Base**

Producer: IEA Coal Research  
 File size: 6,309  
 Dates: 1978-  
 Update frequency: Annually  
 Vendor(s): Belindis, CISTI, INKA

Contains information on current research projects on the following topics: coal industry and mining; coal processing and reserves; energy. Also covers environment. [INFO-GUID00215]

**0706 Computerized Engineering Index - COMPENDEX**

Producer: Fachinformationszentrum Karlsruhe  
 File size: 1,806,000  
 Dates: 1969-  
 Update frequency: Monthly  
 Vendor(s): Dialog, STN

Bibliography with abstracts covering the worldwide literature (except conference proceedings) in engineering and technology including environmental, chemicals and agricultural engineering. [INFO-GUID00026]

**0707 DECHEMA**

Producer: DECHEMA  
 File size: 105,000  
 Dates: 1975-  
 Update frequency: Monthly  
 Vendor(s): STN

Bibliography containing references to international scientific and technical literature in the fields of chemical technology; biotechnology; chemical equipment and plant; pollution control and safety technology. [INFO-GUID00036]

**0708 DEQUIP**

Producer: DECHEMA  
 File size: 8,000min  
 Update frequency: Undefined  
 Vendor(s): STN

Product data base containing information on manufacturers of apparatus and technical equipment in the fields of chemical engineering and environmental technology. It includes about 2,800 companies from all over the world and their products including protected trade marks. The document records contain company name, address and product information. [INFO-GUID00038]

**0709 DETEQ**

Producer: DECHEMA  
 File size: 1,100min  
 Update frequency: Undefined  
 Vendor(s): STN

Product data base containing information on manufacturers of apparatus and technical equipment in the field of environmental engineering. The records contain company name and address and product information. [INFO-GUID00039]

**0710 ENREP**

Producer: Commission of the European Communities  
 File size: 26,000  
 Dates: 1980-  
 Update frequency: Undefined  
 Vendor(s): Echo

On-line directory of research projects covering all aspects of the environmental field. [INFO-GUID00218]

**0711 ENVIROLINE**

Producer: EIC/Intelligence, Inc  
 File size: 120,000  
 Dates: 1971-  
 Update frequency: Monthly  
 Vendor(s): Dialog

Provides indexing and abstracting coverage of more than 5,000 international publications reporting on all aspects of the environment. Included are management, technology, planning, geology, chemistry as they relate to environmental issues. Literature covered includes periodicals, government documents, industry reports. [INFO-GUID00013]

**0712 Environmental Bibliography**

Producer: Environmental Studies Institute  
 File size: 316,905  
 Dates: 1973-  
 Update frequency: Bi-monthly  
 Vendor(s): Dialog

Covers the fields of environment, atmospheric studies, energy, land resources, nutrition and health. Provides quick and easy access to article references for research. [INFO-GUID00022]

**0713 Environmental Chemicals Data and Information Network - ECDIN**

Producer: Commission of the European Communities  
 Joint Research Centre  
 File size: 350,000  
 Update frequency: Undefined  
 Vendor(s): DC Host Centre

Contains information on environmental chemicals available on the Europe region market. Includes official EEC regulations on classification, packaging, labelling of hazardous substances and exposure limits for regulating working conditions together with monitoring methods. Contains extensive data on the impact of chemicals on the environment. Includes data

from UNEP's International Register of Potentially Toxic Chemicals (IRPTC). [INFO-GUID00083]

**0714 Environmental Fate - ENVIROFATE**

Producer: Environmental Pollution Agency  
 Office of Toxic Substances  
 Update frequency: Undefined  
 Vendor(s): CIS

Contains information on environmental fate of chemicals released into the environment. Covers only chemicals produced annually in excess of one million pounds. [INFO-GUID00141]

**0715 Environmental Health News - EHN**

Producer: Occupational Health Services, Inc.  
 File size: 2,500  
 Dates: 1981-  
 Update frequency: Bi-weekly  
 Vendor(s): BRS, CompuServe

On-line newsletter covering environmental health addressed to institutions dealing with hazardous substances. Includes regulatory changes; medical and scientific news. [INFO-GUID00112]

**0716 Hazardline**

Producer: Occupational Health service, Inc  
 File size: 4,500  
 Update frequency: Daily  
 Vendor(s): BRS, CompuServe

Provides information on hazardous substances. For each substance information is provided on: chemicals and physical properties; need for protective clothing; emergency equipment; exposure levels and treatment in case of contamination; waste disposal. [INFO-GUID00099]

**0717 Hazardous Waste News**

Producer: Business Publishers, Inc  
 File size: 800  
 Dates: 1983-  
 Update frequency: Weekly  
 Vendor(s): NewsNet

On-line newsletter covering legislative, regulatory and judicial decisions affecting hazardous waste management. Addressed to those who generate, collect, transport and storage hazardous waste. [INFO-GUID00114]

**0718 HEILBRON**

Producer: Chapman & Hall Ltd.  
 File size: 75,000  
 Update frequency: Twice yearly  
 Vendor(s): Dialog

Represents the full text of two major chemical dictionaries. Chapman & Hall Ltd. "Dictionary of Organic Compounds" and "Dictionary of Organometallic Compounds". It is a source data base of chemical identification, physical-chemical

properties, use, hazard and key reference data to the world's more important chemical substances, as selected by a panel of experts. [INFO-GUID00023]

**0719 HSELINE**

Producer: Health and Safety Executive  
Library and Information Services  
File size: 57,000  
Dates: 1982-  
Update frequency: Monthly  
Vendor(s): ESA-IRS, Pergamon Infoline

Contains records to literature on occupational health and safety covering all industries and occupations: agriculture; chemistry and chemical engineering; electrical engineering; mining and metallurgy; environment; transportation. [INFO-GUID00216]

**0720 Industrial Health and Hazards Update**

Producer: Merton Allen Associates  
Dates: 1984-  
Update frequency: Monthly  
Vendor(s): NewsNet

Contains abstracts on industrial safety and health. Includes regulations; legislation; litigation; factory surveys; toxicity of industrial materials and products; occupational diseases. [INFO-GUID00102]

**0721 Information Systems for Hazardous Organics in Water - ISHOW**

Producer: Environmental Protection Agency  
Office of Toxic Substances  
File size: 5,460  
Update frequency: Undefined  
Vendor(s): CIS

Contains analyses of chemical substances which includes melting point; boiling point; partition coefficient; acid dissociation constant; water solubility; vapour pressure. [INFO-GUID00144]

**0722 INPADOC**

Producer: INPADOC  
File size: 18,000,000min  
Dates: 1968-  
Update frequency: Weekly  
Vendor(s): STN

Contains the bibliographic and family data of about 14 million patent documents of 55 patent issuing organizations. Covers all fields of science and technology. [INFO-GUID00072]

**0723 INPAMONITOR**

Producer: INPADOC  
Update frequency: Weekly  
Vendor(s): STN

Contains the most current bibliographic data of patents and utility model publication of the last six weeks. Covers all areas

of science and technology. [INFO-GUID00071]

**0724 Instructional Resources Information System - IRIS**

Producer: Environmental Protection Agency  
Instructional Resources Center  
File size: 12,500  
Dates: 1979-  
Update frequency: Quarterly  
Vendor(s): BRS, Dialog, CompuServe

Contains educational materials on water quality and waste water treatment. Subjects covered include: environment, water pollution and waste management [INFO-GUID00003]

**0725 International Register of Potentially Toxic Chemicals Data Base - IRPTC**

Producer: United Nations Environment Programme  
File size: 80,900  
Dates: Last 10 years  
Update frequency: Continuously  
Vendor(s): DC Host Centre

Topics include: chemicals; dangerous substances; environmental effects; health conditions; toxic substances; toxicology; waste management. (See database reference under Environmental Chemicals Data and Information Network - ECDIN). [INFO-GUID00011]

**0726 JICST File on Science and Technology: Environmental Pollution**

Producer: Information Centre of Science and Technology  
File size: 199,000  
Dates: 1975-  
Update frequency: Monthly  
Vendor(s): STN

Covers literature on environmental pollution; air pollution; water pollution; toxicology; waste management; treatment of sludge. [INFO-GUID00192]

**0727 LHB**

Producer: Royal Society of Chemistry  
File size: 6,000  
Dates: 1981-  
Update frequency: Monthly  
Vendor(s): STN

Bibliography containing information on hazards to health and safety which are likely to be encountered in chemical and biochemical laboratories. Excluded are hazards for large-scale production plants and transportation of chemicals. [INFO-GUID00064]

**0728 MATBUS**

Producer: Materials Information  
File size: 35,000  
Dates: 1983-  
Update frequency: Monthly  
Vendor(s): STN

Bibliography covering techno-commercial developments in the fields of iron and steel, non-ferrous metals and engineered materials (ceramics, polymers, composites and plastics). If it relates to the main subject literature, energy usage, environmental issues, safety and health is included. Subjects covered include: energy consumption; environmental pollution and protection. [INFO-GUID00063]

**0729 METADEX**

Producer: Material Information  
 File size: 717,000  
 Dates: 1966-  
 Update frequency: Monthly  
 Vendor(s): Dialog, STN

Covers the worldwide literature on metallurgy and has a special classification for steels, ferrous and non ferrous metals and their alloys. Subjects covered include: ferrous alloy production, non-ferrous alloy production and corrosion. [INFO-GUID00062]

**0730 Microbiology Abstracts Section A: Industrial and Applied Microbiology**

Producer: Cambridge Scientific Abstracts  
 File size: 70,000  
 Dates: 1978-  
 Update frequency: Monthly  
 Vendor(s): Dialog, ESA-IRS

Bibliography covering references to literature on detrimental effects and useful applications of bacteria, fungi and viruses in industry. Includes studies on vaccines, pollution and waste treatment. [INFO-GUID00178]

**0731 NIOSH Exposure Data - NFEDA**

Producer: Information Consultants, Inc  
 File size: 249  
 Update frequency: Undefined  
 Vendor(s): CIS

Contains references to work places where workers have been at increased risk of cancer, lung and heart disease. Topics covered include: environment, pollution and health. [INFO-GUID00142]

**0732 Oil and Hazardous Materials Technical Assistance Data System - OHM-TADS**

Producer: Environmental Protection Agency  
 Emergency Response Division (WH-548-b)  
 File size: 1,400  
 Dates: 1950-  
 Update frequency: Undefined  
 Vendor(s): CIS

Contains information on how to deal with chemical substances. Includes all information related to spill response efforts pertinent to any material designated as an oil (petroleum base) or hazardous substances. Also covers safety aspects. [INFO-GUID00005]

**0733 PAKLEGIS - PAKL**

Producer: Paper and Board, Printing and Packaging Industries Research Association  
 File size: 2,700  
 Dates: 1900-  
 Update frequency: Bi-weekly  
 Vendor(s): Pergamon Infoline

References legislation on hazardous substances transportation; packaging types; environmental aspects of packaging; marking and labelling; food quality; occupational hygiene. [INFO-GUID00214]

**0734 PASCAL**

Producer: Centre National de Recherche Scientifique  
 Centre de Documentation Scientifique et Technique  
 File size: 6,500,000  
 Dates: 1973-  
 Update frequency: Monthly  
 Vendor(s): Dialog

A multidisciplinary bibliography equivalent to 79 printed Pascal journals. Literature from international sources is indexed and abstracted. Major subjects covered include: biology, chemistry, applied chemistry, pollution, energy, agriculture sciences, and engineering. [INFO-GUID00017]

**0735 Pesticidal Literature Documentation - PESTDOC**

Producer: Derwent Publications, Ltd  
 File size: 150,500  
 Dates: 1968-  
 Update frequency: Quarterly  
 Vendor(s): SDC

Covers the literature of pesticides and allied data. Subjects covered include: agriculture, chemistry, environment, toxicology. [INFO-GUID00211]

**0736 Pollution Abstracts**

Producer: Cambridge Scientific Abstracts  
 File size: 124,000  
 Dates: 1970-  
 Update frequency: Bi-monthly  
 Vendor(s): Dialog

Resource for references to environmentally related literature on pollution, its sources and its control. Subjects covered are: air pollution, environmental quality, noise pollution, pesticides, solid wastes and water pollution. [INFO-GUID00060]

**0737 Registry of Toxic Effects of Chemical Substances - RTECS**

Producer: National Institute for Occupational Safety and Health  
 File size: 71,000  
 Update frequency: Quarterly  
 Vendor(s): Blaise, CIS, Dimdi

Contains toxicity data on chemicals substances. Subjects covered include primary skin and eye irritation data and en-

vironment. [INFO-GUID00130]

**0738 SILICA**

Producer: Fachinformationszentrum Werkstoffe  
 File size: 20,000  
 Dates: 1968-  
 Update frequency: Monthly  
 Vendor(s): STN

Bibliography for international literature information on ceramics and glass. Contains references to the German and international scientific, technical and historical literature about ceramic, glass and composite materials. Subjects covered include: safety and environmental protection, recycling; energy conservation and business management. [INFO-GUID00046]

**0739 Sludge Newsletter**

Producer: Business Publishers, Inc  
 File size: 416  
 Dates: 1983-  
 Update frequency: Bi-weekly  
 Vendor(s): NewsNet

On-line newsletter covering pollution control residuals waste management. Subjects covered include: storage, treatment, transportation and ultimate disposal; ocean dumping; research and development programmes. [INFO-GUID00137]

**0740 TIT'S**

Producer: Institut Textile de France  
 File size: 160,000  
 Dates: 1971-  
 Update frequency: Monthly  
 Vendor(s): STN

Bibliography covering literature on textiles and textile industry. Also contains information on textile engineering, processes, products, management and environmental issues relating to textile industry. [INFO-GUID00048]

**0741 Toxic Materials News**

Producer: Business Publishers, Inc  
 File size: 800  
 Dates: 1983-  
 Update frequency: Weekly  
 Vendor(s): NewsNet

Newsletter monitoring developments involving toxic substances legislation, regulations and litigation in the United States. Enables those who deal with chemicals to track down new initiatives in congress. [INFO-GUID00116]

**0742 Toxlist**

Producer: American Petroleum Institute  
 Central Abstracting and Indexing Service  
 File size: 70,000  
 Dates: 1979-  
 Update frequency: Weekly

Vendor(s): STN

Contains information about toxicity of chemicals listed on the EPA TSCA (Environmental Protection Agency Toxic Substances Control Act) Inventory or subject to regulations under the Toxic Substances Control Act or similar legislation. [INFO-GUID00049]

**0743 Volkswagenwerk - AGLIDAS**

Producer: Volkswagenwerk AG  
 File size: 84,000  
 Dates: 1971-  
 Update frequency: Monthly  
 Vendor(s): Data-star

Contains references to articles from books; journals; reports; theses dealing with all aspects of the automotive and related industries. Subjects covered include: chemistry, energy, environment. [INFO-GUID00220]

**0744 World Environment Report**

Producer: Business Publishers, Inc  
 File size: 416  
 Dates: 1983-  
 Update frequency: Bi-weekly  
 Vendor(s): NewsNet

Newsletter covering environmental protection issues. Includes air pollution and water pollution control; waste management; toxic substances; natural and energy resources. [INFO-GUID00111]

**0745 World Surface Coatings Abstracts**

Producer: Paint Research Association  
 File size: 82,269  
 Dates: 1976-  
 Update frequency: Monthly  
 Vendor(s): Pergamon Infoline

Covers literature on all aspects surface coatings. Subjects covered include: paints, resins, adhesives, chemistry, environment. [INFO-GUID00207]

**0746 Acid Rain - "What Have They Done to the Rain?"**

25-minute video in three parts, examining the causes and environmental effects of acid rain in Europe. 1 - "Money Point Power station" presents one of Europe's most modern coal-fired electric power stations on the west coast of Ireland and asks whether Generating Boards are coming to grips with the pollution problem. 2 - "In Wales" looks at acid rain pollution in Wales and 'doctoring' of dead lakes in an attempt to find a remedy. 3 - "In Sweden" presents a report from Sweden illustrating the extent of the problem and the accumulated evidence of the cause. Shown on Channel Four in the "Worldwise reports" series. (Producer: Team Video Productions, Canalot, 222 Kensal Road, London W10 5BN, United Kingdom (1987) [in English]. [INFO-GUID00308])

**0747 Air Sampling**

13-minute video for in-plant supervisors and labour or union representatives, showing how to identify and sample airborne hazards such as chemicals, dust silicone, asbestos, copper or lead fumes, gases and vapours, and to select the proper method of controlling these hazards. (Responsible organization: Industrial Accident Prevention Association; Producer: Edward Patterson Associates Ltd., Treetops, Cannongate Road, Hythe, Kent CT21 5PT, United Kingdom (1988) [in English]. [INFO-GUID00294])

**0748 The Ark: Missile Kills Hamlet**

30-minute video examining the history of pesticides and considers how they can be subjected to greater controls without adversely affecting human and plant life. (Producer: Central Independent Television, Video Resource Unit (Insight), Broad Street, Birmingham B1 2JP, United Kingdom (1985) [in English]. [INFO-GUID00328])

**0749 The Ark: Wet Weather Burns**

30-minute video cassette, featuring Prof. Chris Baines and a team of young ecologists who explore environmental issues using hi-tech equipment. Examines the causes of acid rain and what can be done to prevent it. One of a series of six programmes. (Producer: Central Independent Television, Video Resource Unit (Insight), Broad Street, Birmingham B1 2JP, United Kingdom (1985) [in English]. [INFO-GUID00326])

**0750 Battle for the Planet**

Series of seven video programmes, each 52 minutes around key issues relating to Third World development and the environment, covering subjects such as desertification, reforestation, population, air pollution, marine pollution, urban development and food aid. Individual titles: "A Struggle for Shelter", "Eight Litres a Minute", "Kingdom of the Third Day", "Shifting Sands", "Greening the Land", "People Count", "A Safety Net". Co-production between International Broadcasting Trust, United Kingdom, Sveriges Television, Sweden and National Film Board of Canada. (Producer: Concord Video and Film Council, 201 Felixstowe Road, Ipswich,

Suffolk IP3 9BJ, United Kingdom (1987) [in English]. [INFO-GUID00316])

**0751 The Challenge of Survival: Chemicals**

11-minute video, one of a series aiming to make students aware of the need for proper management of natural resources. Illustrates the problems caused by the use of chemicals as the sole means of pest control and illustrates the concept of integrated pest management. Intended for secondary schools. (Producer: Viewtech Audio Visual Media, 161 Winchester Road, Brislington, Bristol BS4 3NJ, United Kingdom (1988) [in English]. [INFO-GUID00322])

**0752 Chemicals in the Community: Chemicals and the Environment**

16-minute video (VHS) examining waste disposal and waste recycling and safeguarding of the environment in general in chemical industry. Gives details concerning methods of pollution control, investigation and review. (Responsible organization: Chemical Industries Association; Producer: Guild Sound and Vision Ltd., 6 Royce Road, Peterborough PE1 5YB, United Kingdom (1987) [in English]. [INFO-GUID00314])

**0753 Chemicals in the Community: On the Move**

15-minute video (VHS) explaining the precautions taken by the chemical industry to ensure the safe transport of chemicals overseas or to another location in Britain, including special fittings on tankers and transport container and vehicle markings. Also includes driver training and the support services available if a spillage occurs. (Responsible organization: Chemical Industries Association; Producer: Guild Sound and Vision (distr.), 6 Royce Road, Peterborough PE1 5YB, United Kingdom [in English]. [INFO-GUID00303])

**0754 Conservation in Towns**

25-minute video in three parts, highlighting the conflicting interests at work in an urban industrial environment. Part 1 - "Where There's Smoke" - follows a group of young people around Birmingham as they try to find out what comes out of the chimneys of local factories. Part 2 - "The Phurnacite Works" - in interviews with local people brings out the balance between the problems of extreme factory pollution and the effect the works have on local employment policy and social policy. Part 3 - "City spaces" - refers the challenge to urban planning from those who appreciate the amenities of a "waste-land" in the city. Shown in Channel 4's "Worldwise report" series. (Producer: Team Video Productions, Canalot, 222 Kensal Road, London W10 5BN, United Kingdom (1987) [in English]. [INFO-GUID00315])

**0755 Controlling Exposure to Toxic Substances**

31-minute video promoting work practices and equipment for protection against toxic substances in the workplace - engineering controls, work practices and procedures and per-

sonal controls. (Responsible organization: Industrial Accident Prevention Association; Producer: Edward Patterson Associates Ltd. (distr.), Treetops, Cannongate Road, Hythe, Kent CT21P 5PT, United Kingdom (1988) [in English]. [INFO-GUID00295])

**0756 COSHH in Practice**

21-minute film or video introducing the Control of Substances Hazardous to Health, (COSHH) Regulations, and outlines what companies using toxic materials should do to comply. Accompanied with illustrated trainer's guide. Intended for management, health and safety advisors and staff. (Responsible organization: Imperial Chemical Industries (ICI); Producer: Rank Millbank, Cullum House, North Orbital Road, Denham Uxbridge, Middx UB9 5HL, United Kingdom (1988) [in English]. [INFO-GUID00292])

**0757 The Delicate Giant**

11-minute video documenting efforts to resolve the conflict in Brazil between economic development and conservation in the case of the Amazon rain forests, and showing a joint experiment between Brazil and the United Nations Development Programme in the Tapajos National Forest. Intended for secondary schools. (Responsible organization: United Nations Radio & Visual Services; Producer: Educational Media International, 235 Imperial Drive, Rayners Lane, Harrow, Middx. HA2 7HE, United Kingdom [in English]. [INFO-GUID00317])

**0758 Do You Ever Stop to Think**

23-minute video illustrating the potential hazards of working in a modern petroleum refinery. Deals with the wearing of protective clothing and using machine tools. Intended for all employees who work on large industrial sites. (Responsible organization: Mobil Oil Co.; Producer: Guild Sound and Vision (distr.), 6 Royce Road, Peterborough PE1 5YB, United Kingdom (1987) [in English]. [INFO-GUID00284])

**0759 A Drop in the Ocean**

60-minute video attacking the reckless use of the North Sea as a dumping ground for large amounts of toxic and hazardous waste from chemical industries. An estimated eighteen million tons of industrial wastes of unknown composition are released into the sea and, in some places in the rivers flowing into it, the water toxicity is so high that swallowing one litre is lethal. Focuses particularly on the white sand dunes of Denmark, the Elbe and the Rhine in Germany and the east coast of the United Kingdom. Intended for general audiences. (Producer: Concord Video & Film Council(distr.), 201 Felixstowe Road, Ipswich, Suffolk IP3 9BJ, United Kingdom (1987) [in English]. [INFO-GUID00309])

**0760 Electron Microscopy - Principles of Radiation Protection**

7-minute video explaining possible radiation hazard in

electron microscopy and how to safeguard against it. (Responsible organization: Imperial College; Producer: Imperial College Television Studio, Electrical Engineering Building, Exhibition Road, London SW7 2BT, United Kingdom (1987) [in English]. [INFO-GUID00293])

**0761 For All Our Sakes**

18-minute video describing the historical development of the Industrial Revolution in terms of environmental degradation. Looks at the symptoms of environmental distress from the viewpoint of what it does to nature as well as people. Shows that some of the damage is being repaired and that efforts are being made to create environmental awareness. Accompanied by teaching notes. Intended for schools, colleges and general audiences. (Responsible organization: Shell UK; Producer: Shell Film Library, Unit 2, Cornwall Works, Cornwall Avenue, Finchley, London N3 1LD, United Kingdom (1988) [in English]. [INFO-GUID00318])

**0762 Handling and Storage of Packaged Dangerous Goods in Port Areas - Part 1: Preparation - Part 2: Implementation**

Two 22-minute videos, pt.1 showing how goods, especially dangerous goods, are handled from the receipt into the port area to being loaded onto the ship; pt. 2 covering the readiness of a port to deal with an emergency and the formation of an emergency plan. Intended for freight forwarders, truck drivers, port and shipping personnel. (Producer: Videotel International, Ramillies House, 1-2 Ramillies Street, London W1V 1DF, United Kingdom [in English]. [INFO-GUID00304])

**0763 Handling Glass in the Flat Glass Industry**

27 minute video (VHS) dealing with safe handling of flat glass and necessary safety precautions. Intended to supplement job instruction. (Responsible organization: Lakeside Training Services for Glass Training; Producer: Glass Training Ltd.(distr.), BGIRA Building, Northumberland Road, Sheffield,S10 2UA, United Kingdom (1987) [in English]. [INFO-GUID00285])

**0764 Hazard Communication: Learning the System**

17-minute video introduction to the Operational Safety and Health Administration (OSHA) Hazard Communications Act (United States) for employers from the employee's point of view. Training the employee in chemical hazard awareness, and stresses the employee's responsibility for making the system work. Discusses how to determine which chemicals are dangerous, labelling and physical effects. Also stresses protective equipment and locating and using emergency equipment. Accompanied by manuals and employee handbooks. (Producer: Edward Patterson Associates Ltd. (distr.), Treetops, Cannongate Road, Hythe, Kent CT21 5PT, United Kingdom (1989) [in English]. [INFO-GUID00329])

**0765 Hearing Protection**

10-minute video informing on various forms of hearing protection and methods of selection. Intended for industrial audiences. (Producer: ROSPA, Film Library, Head Office, Cannon House, Priory Queensway, Birmingham B4 6BS, United Kingdom (1987) [in English]. [INFO-GUID00296])

**0766 Hygiene and the Engineer**

23-minute video aimed specifically at engineers in the food processing industry. (Producer: Voss Training Services, 3 Price Street, Birkenhead, Wirral L41 6JN, United Kingdom (1987) [in English]. [INFO-GUID00306])

**0767 In Partnership with Earth**

One-hour show with John Denver and Environmental Protection Agency (EPA) Administrator Bill Reilly, dealing with the emerging effort to change the emphasis from pollution control to pollution prevention; produced in collaboration between EPA, industry and environmental groups. In addition, a series of 60-second Public Service Announcements with John Denver on environmental concerns. (Responsible organization: Environmental Protection Agency; Producer: Versar Inc., 6850 Versar Center, Springfield, VA 22151-9946, United States (1990) [in English]. [INFO-GUID00330])

**0768 Inherent Safety**

35-minute video with accompanying colour slides and book, arguing the case for incorporating safety considerations at planning stage rather than as post-design additions. Intended for designers and engineers at chemical process plants. (Responsible organization: Institution of Chemical Engineers; Producer: Institution of Chemical Engineers, 165-171 Railway Terrace, Rugby CV21 3HQ, United Kingdom (1987) [in English]. [INFO-GUID00299])

**0769 Lead: Power and Protection**

10-minute video (VHS) describing the historical role of lead as one of the most important metals, production and refining processing, health and safety measures, environmental issues and major uses of lead. Intended for general audiences. (Responsible organization: Lead Development Association; Producer: Lead Development Association, 34 Berkely Square, London W1X 6AJ, United Kingdom (1987) [in English]. [INFO-GUID00305])

**0770 Machine Hazard Awareness**

18-minute video, teaching awareness of machine hazards in a workplace and necessary safety precautions. (Responsible organization: Industrial Accident Prevention Association; Producer: Edward Patterson Associates Ltd.(dist.), Treetops, Cannongate Road, Hythe, Kent CT21 5PT, United Kingdom (1988) [in English]. [INFO-GUID00286])

**0771 Money Grows on Trees**

25-minute video examining the effects of commercial forestry

on the wild landscapes of the UK and to explain who the forestry interests are. Follows a group of future investors and forestry managers into the countryside as they map out future investment, and contrasts their views and objectives with conservationists and those who live in and enjoy the countryside. Shown on Channel Four in their "Diverse reports" Series. (Producer: Team Video Productions, Canalot, 22 Kensal Road, London W10 5B1, United Kingdom (1984) [in English]. [INFO-GUID00319])

**0772 Our Chemical Future**

25-minute video, shown on Channel Four, United Kingdom, in the series *Worldwide Report* under the title "What's the Use of Chemicals?". Examines the effects of pesticide manufacture and use on the environment. 3 parts: "Making pesticides" (8 mins.) visits the ICI factory at Huddersfield and examines the implications of the company's wish to begin production of Paraquat; "Pesticide use in Hertfordshire" (5 mins.) examines an ecosystem and the effects of intensive farming using chemicals and pesticides; "The corporate v. conservationist view" (5 mins.) discusses whether it is possible to have effective, safe and beneficial use of pesticides in the environment. (Producer: Team Video Productions (distr.), Canalot, 222 Kensal Road, London W10 5 BNU, United Kingdom [in English]. [INFO-GUID00300])

**0773 Perspective: Acid Rain**

28-minute film about the work of British scientists on the causes and effects of acid rain and new solutions to it. (Responsible organization: Central Office of Information, Foreign and Commonwealth Office; Producer: CFL Vision, P.O.Box 35, Wetherby, Yorks LS23 7EX, United Kingdom (1987) [in English]. [INFO-GUID00310])

**0774 Perspec. yday! Mayday!**

28-minute film or video dealing with the training of offshore oil rig personnel in hazard prevention and protection. (Responsible organization: Central Office of Information, Foreign and Commonwealth Office; Producer: CFL Vision, P.O.Box 35, Wetherby, Yorks LS23 7EX, United Kingdom (1987) [in English]. [INFO-GUID00287])

**0775 Pollution - Who Cares?**

19-minute film or video, following an average family on a typical day to illustrate how much they contribute to the pollution problem. Illustrates the fact that many pollutants are created because of consumer demand upon modern producers of materials, food and energy. Compares domestic pollution with that produced by industry. Intended for schools, colleges and general audiences. (Responsible organization: British Gas; Producer: British Gas Film & Video Library, c/o Viscom Ltd., Park Hall Road Trading Estate, Dulwich, London SE21 8FL, United Kingdom (1988) [in English]. [INFO-GUID00307])



**0776 Q.E.D.: Invisible Killer**

30-minute video, investigating dioxin pollution, which is thought to have caused deaths and deformities among cattle in farming areas in the United Kingdom and Ireland. (Responsible organization: BBC Television; Producer: BBC Enterprises Ltd., Non-Theatric Film Sales, Woodlands, 80 Wood Lane, London W12 0TT, United Kingdom (1988) [in English]. [INFO-GUID00301])

**0777 Roving Report 8818B: "UK Waste"**

7-minute video reporting on a controversial proposal to convert disused tin mines in Cornwall into underground disposal sites for waste imported from the United States. Advocates for the plan claim it will bring prosperity and work to the impoverished South West of Britain. Opponents warn that the system is not safe, and could cause long-term damage to the environment. (Producer: WTN Library (distr.), ITN House, 48 Wells Street, London W1, United Kingdom (1988) [in English]. [INFO-GUID00312])

**0778 Roving Report 8829A: North Sea: Price of Oil**

7-minute video, reporting on the explosion on board the Piper Alpha platform in the North Sea, in which more than 160 men lost their lives. (Producer: WTN Library, ITN House, 48 Wells Street, London W1, United Kingdom (1988) [in English]. [INFO-GUID00298])

**0779 Roving Report 8915B: Alaska: Oil Spill**

7-minute video reporting on the running aground of the tanker, Exxon Valdez in Prince William Sound, Alaska, at the end of March 1989, which caused at least 10 mill. gallons of petroleum to spill into the sound, with devastating effects on wildlife. (Producer: WTN Library (distr.), ITN House, 48 Wells Street, London W1, United Kingdom (1989) [in English]. [INFO-GUID00327])

**0780 Safe Handling of LPG: No.1: Pressurized Bulk Storage and Road and Rail Loading.**

43-minute video showing how to limit the hazards of storage and handling of liquefied petroleum gas (LPG). Promotes good operational procedures, effective training and installation of safety equipment. (Responsible organization: Institution of Chemical Engineers; Producer: Institution of Chemical Engineers, 165-171 Railway Terrace, Rugby CV21 3HQ, United Kingdom (1987) [in English]. [INFO-GUID00297])

**0781 The Safe Use of Cranes in the Offshore Industry**

22-minute film or video dealing with the safe operation of hoisting machinery in offshore industry, demonstrating safe crane operation and illustrating, with diagrams some of the fundamental theory. (Responsible organization: Department of Energy; Producer: Videntel International (dist.), Ramillies House, 1-2 Ramillies Street, London W1B 1DF, United Kingdom (1988) [in English]. [INFO-GUID00288])

**0782 Safety in the Meat Retail Industry**

14-minute video (VHS) aiming to assist in accident prevention, focusing on housekeeping, safe use of equipment and machinery, lifting and carrying and emergency and accident procedures. Intended for management, staff or enforcing authorities. (Responsible organization: Arun District Council; Producer: Arun District Council, Arun Civic Centre, Maltravers Road, Littlehampton, W. Sussex BN17 5LF, United Kingdom (1988) [in English]. [INFO-GUID00289])

**0783 Safety on the Job: Working with Machinery**

17-minute video teaching safety from the perspectives both of protecting the worker and safeguarding the machinery. Description of available safety equipment. Intended for secondary schools and adults. (Producer: Educational Media International, 235 Imperial Drive, Rayners Lane, Harrow, Middx HA2 7HF, United Kingdom (1986) [in English]. [INFO-GUID00290])

**0784 So It Won't Happen Again**

15-minute dramatized video programme, dealing with safety aspects of work in a sawmill. Follows a fictitious accident investigation. (Responsible organization: ; Producer: Educational Media International (distr.), 235 Imperial Drive, Rayners Lane, Harrow, Middx HA2 7HF, United Kingdom (1985) [in English]. [INFO-GUID00291])

**0785 Survival: A Sheltered Existence**

26-minute film looking at the marine life of the Laguna Madre on the coast of Texas now threatened by the oil industry. (Producer: Survival Anglia, Survival Hire Library, Brook House, 113 Park Lane, London W1Y 4DX, United Kingdom (1983) [in English]. [INFO-GUID00311])

**0786 Timber!**

25-minute video in three parts, using the exploitation and use of timber as case study to examine the distribution and transfer of wealth and resources on a global scale. Part 1 - "In New Guinea" - describes the cutting of lowland rain forests by a multinational company and the opposition of local people. Part 2 - "In England" - shows the availability of a wide range of consumer goods from the rain forest and asks whether it is possible to use the rain forest without destroying them. Part 3 - "From forest to factory" - examines whether the uncontrolled cutting of tropical rain forests is preventable. Shown in Channel Four's "Worldwide Reports" series. (Producer: Team Video Production, Canalot, 222 Kensal Road, London W10 5BN, United Kingdom (1987) [in English]. [INFO-GUID00320])

**0787 To See or Not to See**

18-minute video with accompanying booklet, demonstrating various industrial operations typically hazardous to sight, using such substances as metal, wood and hot or toxic liquids; lists of processes where eye protection is necessary and of

protective equipment available. (Responsible organization: British Aerospace Aircraft Group; Producer: Guild Sound and Vision, 6 Royce Road, Peterborough PE1 5YB, United Kingdom (1987) [in English]. [INFO-GUID00302])

**0788 Watch Your Waste**

20-minute video aiming to alert industry to the potential savings to be made from waste reclamation. Shows a variety of successful processes and demonstrates that the UK has a reclamation industry with a turnover in excess of 2 billion pounds a year. Encourages people to find out if waste produced by their company could be economically recycled and to think about using reclaimed secondary materials instead of primary ones. (Responsible organization: Department of Trade & Industry; Producer: CFL Vision, P.O.Box 35, Weatherby, Yorks. LS23 7EX, United Kingdom (1987) [in English]. [INFO-GUID00313])

**0789 What Goes Up Must Come Down**

30-minute video looking at the problem of air pollution, particularly acid rain and its effect on buildings, forests and freshwater. (Producer: Central Independent Television, Video Resource Unit (Insight), Broad Street, Birmingham B1 2JP, United Kingdom (1984) [in English]. [INFO-GUID00325])

**0790 The World of Economics No. 12: Economics of the Environment**

18-minute video examining aspects of political economy in relation to environmental problems, where liability is often difficult to establish and property rights are vague. Prof. Richard Stroup discusses how economists have proposed non-governmental solutions for such problems. Accompanied by discussion guide. (Responsible organization: Institute of Economic Affairs; Producer: Guild Sound & Vision (distr.), 6 Royce Road, Peterborough PE1 5YB, United Kingdom (1988) [in English]. [INFO-GUID00321])

**Acid rain**

- 746 Acid Rain - "What Have They Done to the Rain?" [Film]
- 749 The Ark: Wet Weather Burns [Film]
- 773 Perspective: Acid Rain [Film]
- 789 What Goes Up Must Come Down [Film]

**Advanced technology**

- 499 The Impact of New Technologies on the Environment [Handbook]
- 638 Czechoslovakia. Low-Waste Technology in Selected Chemical Processes. Terminal Report. [Technical report]

**Agri-product processing**

- 197 Institute for Storage and Processing of Agricultural Products [National organization]

**Agricultural wastes**

- 512 Manual de los Derivados de la Cana de Azúcar [Handbook]
- 646 Activated Carbon from Agricultural Wastes. [Technical report]

**Agriculture**

- 003 Commonwealth Agricultural Bureau [International organization]
- 121 Technology Consultancy Centre [National organization]
- 159 Agricultural Institute [National organization]
- 162 Environmental Engineering Research Centre [National organization]
- 191 Centre for Agricultural Publishing and Documentation [National organization]
- 240 Institut des Régions Arides [National organization]
- 352 Institute of Information and Technical Research [National organization]
- 358 Documentation and Scientific Information Centre [National organization]
- 379 Food and Agriculture Organization of the United Nations [United Nations organization]
- 442 Agricultural and Environmental Policies [Handbook]
- 498 Ill Winds: Airborne Pollution's Toll on Trees and Crops [Handbook]
- 734 PASCAL. [Database]

**Agro-chemicals**

- 005 Groupement International des Associations Nationales de Fabricants de Produits Agrochimiques [International organization]
- 041 Agriculture Canada. Research Station Vancouver [National organization]
- 049 Forest Pest Management Institute [National organization]
- 106 Fraunhofer-Institut für Umweltchemie und

**Ökotoxikologie [National organization]**

- 141 Indian Agri Research Institute [National organization]
- 250 British Agrochemicals Association Ltd. [National organization]
- 271 Environmental Research Group [National organization]
- 278 Hazelton UK [National organization]
- 348 Western Agricultural Chemicals Association [National organization]
- 460 DDT and its Derivatives: Environmental Aspects [Handbook]
- 692 AGPAT [Database]

**Agro-industry**

- 068 Centro de Desarrollo Industrial del Ecuador [National organization]
- 239 Thai Institute of Science and Technical Research [National organization]
- 301 Natural Resources Institute [National organization]
- 632 Ecuador. Assistance in Establishing an Environmental Laboratory to Control the Agro-Industrial Development in the Eastern Part of the Country. Terminal Report. [Technical report]

**Air pollution**

- 013 International Union of Air Pollution Prevention Associations [International organization]
- 029 Department of Environment [National organization]
- 037 Fundacao Estadual de Engenharia do Meio Ambiente [National organization]
- 057 Petro Canada [National organization]
- 058 Pulp & Paper Research Institute of Canada [National organization]
- 073 Air Quality Agency [National organization]
- 074 Association for Air Pollution Prevention (Association pour la Prevention de la Pollution Atmospherique) [National organization]
- 087 Institut Francais de l'Energie [National organization]
- 108 Goepfert, Reimer & Partner [National organization]
- 113 Lurgi GmbH [National organization]
- 113 Universität Karlsruhe [National organization]
- 123 Technical Chamber of Greece [National organization]
- 148 M/S Travancore Titanium Products Ltd. [National organization]
- 155 Steam Boilers & Smoke Nuisances, Maharashtra State [National organization]
- 160 Institute for Industrial Research and Standards [National organization]
- 233 Swedish Environmental Research Institute [National organization]
- 245 Allott and Lomax, Consulting Engineers [National organization]
- 252 British Glass Manufacturers Confederation [National organization]
- 263 Chatfield Applied Research Laboratories Ltd. [National organization]
- 266 Coal Research Establishment [National organization]
- 299 National Power [National organization]

300 National Society for Clean Air [National organization]  
 319 Air and Waste Management Association [National organization]  
 337 National Council of the Paper Industry for Air & Stream Improvement [National organization]  
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071 Institute of Oceanography and Fisheries [National organization ]  
 089 National Bureau for Data on Oceanology (Bureau National des Données Oceanologiques) [National organization]

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**Arid zone**

240 Institut des Régions Arides [National organization]

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 338 National Geophysical and Solar-Terrestrial Data Centre [National organization]  
 351 Institute of Hydrometeorological Information [National organization]  
 353 Institute of Scientific Research for Hydrometeorological Information [National organization]  
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199 Intron B.V. [National organization]

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- 483 Exposure Monitoring of Lead and Cadmium - an International Pilot Study [Handbook]

**Canada**

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454 Climate and Energy: the Feasibility of Controlling CO<sub>2</sub> Emissions [Handbook]  
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**Carcinogen**

- 096 Biochemisches Institut für Umweltcarcinogene [National organization]

**Casting**

- 311 Steel Castings Research and Trade Association [National organization]

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738 SILICA [Database]

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505 Le Ciel Déchiré: Pouvons-Nous Sauver la Couche d'Ozone? [Handbook]

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**Chemical analyses**

278 Hazelton UK [National organization]

**Chemical analysis**

106 Fraunhofer-Institut für Umweltchemie und Ökotoxikologie [National organization]

107 Gesellschaft fuer Strahlen- und Umweltforschung, Institut fuer Oekologische Chemie [National organization]

161 Analyst Ltd. [National organization]

241 Governmental Analytical Laboratory [National organization]

260 Central Scientific Laboratories [National organization]

263 Chalfield Applied Research Laboratories Ltd. [National organization]

289 John Ashworth & Partners [National organization]

**Chemical industry**

046 Corporation of the City of Windsor [National organization]

068 Centro de Desarrollo Industrial del Ecuador [National organization]

193 DSM Research Ltd. [National organization]

279 IAI, Consultants Ltd. [National organization]

286 Institution of Chemical Engineers [National organization]

325 Chemical Industry Institute of Toxicology [National organization]

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372 European Council of Federations in the Chemistry Industry [Regional organization]

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491 Guidelines for Vapor Release Mitigation [Handbook]

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144 Indofil Chemicals Ltd. [National organization]

169 Environmental Engineering Department [National organization]

185 Centro Mexicano de Información Química [National organization]

259 Burgoyne Consultants Ltd. [National organization]

264 Chem Systems International Ltd. [National organization]

276 Grace Service Chemicals: Grace Dearborn Ltd. [National organization]

278 Hazelton UK [National organization]

291 Kodak Ltd [National organization]

305 Royal Society of Chemistry [National organization]

306 Royal Society of Chemistry [National organization]

321 American Petroleum Institute [National organization]

326 Chemical Information Branch [National organization]

339 National Institute for Occupational Safety and Health [National organization]

367 Centre of Ecology and Toxicology of the European Chemistry Industry [Regional organization]

375 Research Centre of the European Communities [Regional organization]

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- 458 Control Systems for the Introduction of Chemical Substances for Use in the Steel Industry [Handbook]
- 480 EPA Chemical Profiles for Extremely Hazardous Substances [Handbook]
- 507 Learning from Accidents in Industry [Handbook]
- 508 Local Preparedness for Chemical Accidents [Handbook]
- 523 Polychlorinated Biphenyls (PCB) - Fate and the Effect in the Canadian Environment [Handbook]
- 545 Use and Disposal of Wastes from Phosphoric Acid and Titanium Dioxide Production [Handbook]
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- 558 Chemical and Engineering News [Journal]
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- 562 Chemosphere [Journal]
- 573 European Chemical News [Journal]
- 582 IRPTC Bulletin - International Register of Potentially Toxic Chemicals [Journal]
- 627 Risk Assessment of Chemicals in the Environment [Proceedings]
- 655 Environment Impact Analysis of the Manufacture of .....(series) [Technical report]
- 680 Storage of Hazardous Materials [Technical report]
- 700 CASREACT [Database]
- 701 Chemical Abstracts - CA [Database]
- 703 CHI [Database]
- 707 DECHEMA [Database]
- 708 DEQUIP [Database]
- 713 Environmental Chemicals Data and Information Network - ECDIN [Database]
- 714 Environmental Fate - ENVIROFATE [Database]
- 718 HEILBRON [Database]
- 721 Information Systems for Hazardous Organics in Water - ISHOW [Database]
- 725 International Register of Potentially Toxic Chemicals Data Base - IRPTC [Database]
- 727 LHB [Database]
- 732 Oil and Hazardous Materials Technical Assistance Data System - OHM-TADS [Database]
- 737 Registry of Toxic Effects of Chemical Substances - RTECS [Database]
- 742 Toxlist [Database]
- 751 The Challenge of Survival: Chemicals [Film]
- 753 Chemicals in the Community: On the Move [Film]
- 759 A Drop in the Ocean [Film]
- 776 Q.E.D.: Invisible Killer [Film]

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- 242 Institute of Public Health [National organization]
- 249 Borax Research Ltd. [National organization]
- 290 John Wilkinson [National organization]
- 470 Environmental Chemistry of Herbicides [Handbook]
- 527 Pulp and Paper Chemistry and Chemical Technology [Handbook]
- 561 Chemistry and Industry [Journal]
- 690 Abstract Bulletin of the Institute of Paper Chemistry - PAPERCHEM [Database]

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- 342 Oak Ridge National Laboratory [National organization]
- 351 Institute of Hydrometeorological Information [National organization]
- 454 Climate and Energy: the Feasibility of Controlling CO<sub>2</sub> Emissions [Handbook]
- 455 Climate Change: Meeting the Challenge [Handbook]
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- 486 The Formation of Stable Components in the Atmosphere due to Energy Production [Handbook]
- 488 Greenhouse: Planning for Climate Change [Handbook]
- 505 Le Ciel Déchiré: Pouvons-Nous Sauver la Couche d'Ozone? [Handbook]
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- 604 Energy Technologies for Reducing Emissions of Greenhouse Gases [Proceedings]
- 622 Ozone Depletion, Greenhouse Gases and Climate Change [Proceedings]
- 626 Preparing for Climate Change [Proceedings]

**Coal**

- 140 Harcourt Butler Technological Institute [National organization]
- 207 Volker Stevin Roads and Asphalt B.V. [National organization]
- 266 Coal Research Establishment [National organization]

- 344 Pittsburgh Energy Technology Center [National organization]  
 518 Nuclear Gasification of Coal for Control of Carbon Dioxide Emissions. [Handbook]  
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 704 Coal Data Base [Database]  
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**Coal gasification**

- 540 Toxicology of Coal Conversion Processing [Handbook]

**Coal liquefaction**

- 251 British Coal Corporation [National organization]  
 540 Toxicology of Coal Conversion Processing [Handbook]

**Coast**

- 514 Metals in Coastal Environments of Latin America [Handbook]  
 541 Training Manual of the Quantity and Type of Land Based Pollutant Discharges into the Marine and Coastal Environment [Handbook]

**Cocoa**

- 120 Cocoa Research Institute [National organization]

**Combustion**

- 281 Institute of Energy [National organization]

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- 444 Apeil - Awareness and Preparedness for Emergencies at Local Level - a Process for Responding to Technological Accidents [Handbook]

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- 384 United Nations Centre for Human Settlements [United

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**Consumers**

- 243 AFRC Institute of Food Research [National organization]  
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- 026 N.S.W. Dairy Corporation [National organization]  
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- 119 Untersuchungsstelle für Umwelttoxikologie Schleswig-Holstein [National organization]

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**Desertification**

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**Detergents**

260 Central Scientific Laboratories [National organization]

**Developed countries**

014 Organisation for Economic Co-operation and Development [International organization]

**Developing countries**

- 301 Natural Resources Institute [National organization]
- 453 Cleaning Up: United States Waste Management Technology and Third World Development [Handbook]
- 475 Environmental Impact Assessment (EIA) - Basic Procedures for Developing Countries [Handbook]
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**Development aid**

- 080 Centre Technique Forestier Tropical [National organization]
- 520 Plan of Action for Strengthening Environmental Aspects in Danish Development Assistance: the Overall Strategy [Handbook]

**Dyeing**

320 American Association of Textile Chemists and Colorists [National organization]

**Dyes**

- 209 Universum Enterprises Consultants on Environmental Controls [National organization]
- 327 Ecological & Toxicological Association of Dyestuffs Manufacturers Industry [National organization]

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- 194 Foundation for Applied Ecology [National organization]
- 408 Essential Whole Earth Catalogue [Directory]
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- 064 Centro de Documentación Rafael M. Salas [National organization]
- 088 International Research Centre on Environment and Development (Centre International de Recherche sur l'Environnement et le Développement [National organization]
- 137 Environmental Information Systems [National organization]
- 179 Arab Development Institute [National organization]
- 366 South-Pacific Bureau for Economic Co-operation [Regional organization]
- 377 Economic and Social Commission for Asia and the Pacific [United Nations organization]
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**Economic planning**

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**Effluent treatment**

025 Australian Newsprint Mills Limited [National organization]  
 052 Lakefield Research. (a Division of Falconbridge Ltd.) [National organization]  
 063 Hydrobiology Institute Academia Sinica [National organization]  
 079 Centre Technique du Papier [National organization]  
 131 Atul Consultants Private Limited [National organization]  
 134 Bombay Textile Research Association [National organization]  
 144 Indofil Chemicals Ltd. [National organization]  
 148 M/S Travancore Titanium Products Ltd. [National organization]  
 196 Industrial Products and Services TNO [National organization]  
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 043 Alberta Environmental Centre [National organization]  
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 055 Ministry of Environment of Quebec [National organization]  
 062 Beijing Central Engineering & Research Incorporation of

Iron and Steel Industry [National organization]  
 217 National Institute of Hygiene [National organization]  
 245 Allott and Lomax, Consulting Engineers [National organization]  
 261 Centre for Environmental Management and Planning [National organization]  
 274 EW Bank Preece Limited [National organization]  
 292 L.G. Mouchel & Partners, Consulting Engineers Ltd. [National organization]  
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669 Algeria. Mercury Cell Restoration Compared with Replacement by Membrane Cells [Technical report]

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564 CODATA Bulletin [Journal]

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- 439 Accidental Chemical Releases and Local Emergency Response: Analysis Using the Acute Hazardous Events Data Base [Handbook]
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- 465 Emergency Planning for Industrial Crisis: an Overview [Handbook]
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- 508 Local Preparedness for Chemical Accidents [Handbook]
- 603 Emergency Planning for Industrial Hazards [Proceedings]

**Emissions**

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- 087 Institut Français de l'Énergie [National organization]
- 101 Fachinformationszentrum-Energie, Physik, Mathematik, GMBH [National organization]
- 113 Lurgi GmbH [National organization]
- 143 Indian Institute of Technology [National organization]
- 220 Energy Research and Modernising Institute [National organization]
- 281 Institute of Energy [National organization]
- 321 American Petroleum Institute [National organization]
- 694 APIIT [Database]
- 695 APIPAT [Database]

**Energy conservation**

- 104 Fichtner GmbH & Co. KG [National organization]
- 156 TATA Energy Research Institute [National organization]
- 276 Grace Service Chemicals: Grace Dearborn Ltd. [National organization]
- 281 Institute of Energy [National organization]
- 298 National Industrial Fuel Efficiency Service Ltd. [National organization]
- 579 INECA Journal [Journal]
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- 129 State Authority for Energy Management and Safety [National organization]

**Energy management**

- 218 Polish Academy of Sciences [National organization]

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- 405 Energy and Environmental Terms: a Glossary [Directory]

**Energy saving**

- 297 Moldow Ltd. [National organization]

**Engineering**

- 022 Centro Argentino de Referencia en Ingeniería Sanitaria y Medio Ambiente [National organization]
- 187 Instituto de Ingeniería [National organization]
- 212 Papua New Guinea University of Technology [National organization]
- 286 Institution of Chemical Engineers [National organization]
- 290 John Wilkinson [National organization]
- 292 I.G. Mouchel & Partners, Consulting Engineers Ltd. [National organization]
- 294 Manderstam Consulting Services (ENG.) [National organization]
- 328 Engineering Index Inc [National organization]
- 383 Pan American Health Organization [United Nations organization]
- 397 ACEC Engineering Services Directory for Waste Management [Directory]
- 558 Chemical and Engineering News [Journal]
- 591 Process Engineering [Journal]
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**Engineers**

281 Institute of Energy [National organization]

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**Environmental auditing**

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**Environmental effects**

016 Scientific Committee in Charge of Environment Programmes [International organization]  
 027 Packaging Council of Australia [National organization]  
 028 Versuchsanstalt fuer Lederindustrie [National organization]  
 054 Manitoba Environment [National organization]  
 076 Centre of Nuclear Studies in Saclay (Centre d'Etudes Nucléaires de Saclay) [National organization]  
 085 Information and Research Centre on Pollution (Centre d'Information et de Recherche sur les Nuisances) [National organization]  
 088 International Research Centre on Environment and Development (Centre International de Recherche sur l'Environnement et le Développement) [National organization]  
 101 Fachinformationszentrum-Energie, Physik, Mathematik, GMBH [National organization]  
 104 Fichtner GmbH & Co. KG [National organization]  
 105 Forschungsvereinigung Automobiltechnik [National organization]  
 106 Fraunhofer-Institut für Umweltchemie und Ökotoxikologie [National organization]  
 177 Environment Protection Centre [National organization]  
 178 National Scientific and Technical Information Centre [National organization]  
 185 Centro Mexicano de Información Química [National organization]  
 264 Chem Systems International Ltd. [National organization]  
 280 ICT Agrochemicals [National organization]  
 293 Lead Development Association [National organization]  
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 047 Department of the Environment of the Province of Alberta [National organization]  
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 174 National Institute for Environmental Studies [National

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 221 Centro Nacional de Información y Documentación [National organization]  
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 249 Borax Research Ltd. [National organization]  
 256 British Steel plc [National organization]  
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 135 Central Inland Capture Fisheries Research Institute [National organization]  
 145 Industrial Effluents and Environmental Pollution Control Division [National organization]  
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**Information centre**

167 Clean Japan Center [National organization]  
 175 Osaka City Institute of Public Health & Environmental Sciences [National organization]  
 368 Commission of European Communities [Regional organization]  
 375 Research Centre of the European Communities [Regional organization]

**Information exchange**

373 Group for the Development of the European Market of Information [Regional organization]

**Information service**

047 Department of the Environment of the Province of Alberta [National organization]  
 186 Innovacion-Informacion-Tecnologia [National organization]  
 203 Netherlands Organization for Applied Scientific Research (Nederlandse Organisatie for Toegepast-Natuur-

wetenschappelijk Onderzoek) [National organization]  
 343 Oak Ridge National Laboratory [National organization]  
 414 INFOTERRA International Directory of Sources [Directory]

**Information system**

004 Commonwealth Scientific and Industrial Research Organization [International organization]  
 396 ACCIS Guide to United Nations Information Sources on the Environment [Directory]  
 437 A Survey of Information Systems on OECD Member Countries Covering Accidents Involving Hazardous Substances. [Handbook]  
 602 Final Report of a Meeting on Computer-Aided Tools of Environmental Impact Assessment for Industrial Planning [Proceedings]

**Instrumentation industry**

040 Institute for Instrument Design [National organization]

**Insulation**

099 Deutsche Gesellschaft für Holzforschung [National organization]

**International**

621 One Earth - One World [Proceedings]

**Iran (Islamic Republic of)**

640 Iran (Islamic Republic of). Pharmaceutical Industrial Waste Treatment [Technical report]

**Iron and steel industry**

062 Beijing Central Engineering & Research Incorporation of Iron and Steel Industry [National organization]  
 195 Hoogovens Group B.V. - Ijmuiden [National organization]  
 256 British Steel plc [National organization]  
 458 Control Systems for the Introduction of Chemical Substances for Use in the Steel Industry [Handbook]  
 516 Noise and the Steel Industry. [Handbook]

**Jute**

147 Jute Technological Research Laboratories [National organization]

**Kenya**

631 Kenya. Advisory Service Mission by UNIDO to Chandaria Industries, Nairobi, Regarding the Proposed Paper Mill Project [Technical report]

**Laboratory**

- 487 GLP directives [Handbook]
- 632 Ecuador. Assistance in Establishing an Environmental Laboratory to Control the Agro-Industrial Development in the Eastern Part of the Country. Terminal Report. [Technical report]
- 727 I.HB [Database]

**Latin America**

- 514 Metals in Coastal Environments of Latin America [Handbook]

**Lead**

- 054 Manitoba Environment [National organization]
- 293 Lead Development Association [National organization]
- 468 Environmental and Health Controls on Lead [Handbook]
- 483 Exposure Monitoring of Lead and Cadmium - an International Pilot Study [Handbook]
- 506 Lead: Environmental Aspects [Handbook]
- 629 Secondary Lead and Zinc [Proceedings]
- 769 Lead: Power and Protection [Film]

**Leather industry**

- 028 Versuchsanstalt fuer Lederindustrie [National organization]
- 077 Centre Technique Cuir Chaussure Maroquinerie [National organization]
- 206 TNO Leather and Shoe Research Institute [National organization]
- 253 British Leather Confederation [National organization]
- 360 Leather Institute of Zimbabwe [National organization]
- 415 International Leather Guide [Directory]
- 595 World Footwear [Journal]
- 596 World Leather [Journal]

**Legal aspects**

- 224 National Chemical Laboratories [National organization]
- 369 Conseil International du Droit de l'Environnement [Regional organization]

**Legislation**

- 100 Environmental Law Information System [National organization]
- 331 Environmental Studies Institute [National organization]
- 332 Environmental Study Conference [National organization]
- 389 United Nations Environment Programme [United Nations organization]

**Liquid petroleum gas**

- 780 Safe Handling of L.P.G. No.1: Pressurized Bulk Storage and Road and Rail Loading. [Film]

**Low and non-waste technology (LNWT)**

- 452 Selected Topics on Clean Technology [Handbook]
- 457 Compendium on low- and non-waste technology. [Handbook]
- 563 Cleaner Production [Journal]
- 667 Low Waste Technologies in Selected Industries [Technical report]
- 668 Low-Waste Technology in Selected Chemical Processes [Technical report]
- 685 US EPA Shifts its Priorities to Pollution Prevention [Technical report]
- 767 In Partnership with Earth [Film]

**Location of industry**

- 132 Bhilai Steel Plant [National organization]

**Lubricants**

- 476 Environmental Impact of Used Motor Oil [Handbook]

**Machinery**

- 429 Who Makes Machinery and Plant (Wer baut Maschinen) [Directory]
- 770 Machine Hazard Awareness [Film]
- 783 Safety on the Job: Working with Machinery [Film]

**Management**

- 438 Acceptable Risk? - Making Decisions in a Toxic Environment. [Handbook]
- 635 India. Environmental Control Management at Four Fertilizer Manufacturing Companies and Assistance with Environmental Problem Solving at Four others. Technical Report [Technical report]

**Manganese**

- 511 Manganese in the Canadian Environment [Handbook]

**Manufacturing**

- 421 Directory of Pollution Control Equipment Companies in Western Europe [Directory]

**Marine pollution**

- 082 Documentation, Research and Experimentation Centre on Hazardous Water Pollution (Centre de Documentation de Recherche et d'Experimentation sur les Pollutions Accidentelles des Faux) [National organization]
- 086 Information Centre for Problems related to the Marine Environment (Centre d'Information pour les Problèmes de l'Environnement Marin) [National organization]
- 089 National Bureau for Data on Oceanology (Bureau Na-

tional des Données Océanologiques) [National organization]  
 202 Netherlands Institute for Fishery Investigations [National organization]  
 381 International Maritime Organization [United Nations organization]  
 490 Guidelines for the Baltic Monitoring Programme for the Third Stage [Handbook]  
 531 State Responsibility and the Marine Environment: the Rules of Decision [Handbook]  
 541 Training Manual of the Quantity and Type of Land Based Pollutant Discharges into the Marine and Coastal Environment [Handbook]  
 608 The Evaluation of the Hazards of Harmful Substances Carried by Ships [Proceedings]  
 628 Scientific Aspects of Marine Pollution (GESAMP) [Proceedings]  
 759 A Drop in the Ocean [Film]  
 778 Roving Report 8829A: North Sea: Price of Oil [Film]  
 785 Survival: A Sheltered Existence [Film]

**Marketing**

559 Chemical Marketing Reporter [Journal]

**Materials technology**

579 INECA Journal [Journal]  
 699 British Non-Ferrous Metals Abstracts - BNF METALS [Database]

**Mathematical analysis**

462 Design of an Air-Pollution Monitoring Network [Handbook]  
 486 The Formation of Stable Components in the Atmosphere due to Energy Production [Handbook]  
 515 Natural Resource and Environmental Policy Analysis: Cases in Applied Economics [Handbook]  
 620 Natural and Man-Made Hazards [Proceedings]

**Mauritius**

653 Economic Development with Environmental Management Strategies for Mauritius [Technical report]

**Meat industry**

782 Safety in the Meat Retail Industry [Film]

**Medium scale industry**

051 Industrial Research Centre of Quebec [National organization]  
 619 Proceedings of the National Training Course on Industrial Pollution Control for Small and Medium Scale Industries [Proceedings]

**Mercury**

513 Mercury: Environmental Aspects [Handbook]  
 669 Algeria. Mercury Cell Restoration Compared with Replacement by Membrane Cells [Technical report]

**Metal scrap**

334 Institute of Scrap Recycling Industries Inc. [National organization]  
 639 China. Modernization of Copper and Copper Alloy Scrap Processing in Shanghai. Final Report. [Technical report]

**Metallurgy**

335 Minerals, Metals & Materials Society [National organization]  
 728 MATBUS [Database]  
 729 METADEX [Database]

**Metals**

446 Biotechnology of Metals Manual [Handbook]

**Metallworking industry**

279 IAL Consultants Ltd. [National organization]

**Meteorology**

394 World Meteorological Organization [United Nations organization]  
 395 World Meteorological Organizations [United Nations organization]

**Methane**

448 Carbon Dioxide Emissions in a Methane Economy [Handbook]

**Microbiology**

598 Zentralblatt fuer Microbiologie [Journal]  
 730 Microbiology Abstracts Section A: Industrial and Applied Microbiology [Database]

**Mineral water**

688 Syrian Arab Republic. Assistance in Water and Waste Water Treatment in the Food Industry. Part 4. Drekish Water Filling Factory. Final Report [Technical report]

**Mining**

046 Corporation of the City of Windsor [National organization]  
 052 Lakefield Research (a Division of Falconbridge Ltd.)

[National organization]

**Models**

- 462 Design of an Air-Pollution Monitoring Network [Handbook]
- 486 The Formation of Stable Components in the Atmosphere due to Energy Production [Handbook]
- 515 Natural Resource and Environmental Policy Analysis: Cases in Applied Economics [Handbook]
- 620 Natural and Man-Made Hazards [Proceedings]

**Modernization**

- 639 China. Modernization of Copper and Copper Alloy Scrap Processing in Shanghai. Final Report. [Technical report]

**Natural gas**

- 234 Swedish Gas Association [National organization]

**Natural resources**

- 003 Commonwealth Agricultural Bureau [International organization]
- 012 International Union for Conservation of Nature and Natural Resources [International organization]
- 019 World Resources Institute [International organization]
- 021 Ministère de l'Hydraulique, des Forêts et de la Pêche [National organization]
- 036 Fundação Centro Tecnológico de Minas Gerais [National organization]
- 037 Fundação Estadual de Engenharia do Meio Ambiente [National organization]
- 060 Centro de Información y Documentación [National organization]
- 077 Bundesanstalt für Geowissenschaften und Rohstoffe [National organization]
- 102 Federal Institute for Geosciences and Natural Resources [National organization]
- 127 Institute for Environmental Protection [National organization]
- 154 Society for Clean Environment [National organization]
- 170 Environmental Pollution Research Centre [National organization]
- 179 Arab Development Institute [National organization]
- 191 Centre for Agricultural Publishing and Documentation [National organization]
- 213 National Office for Natural Resources Evaluation (Oficina Nacional de Evaluación de Recursos Naturales) [National organization]
- 225 Science and Technology Research Unit [National organization]
- 229 National Environmental Protection Board (Statens Naturvårdsverk) [National organization]
- 236 Federal Office for Environmental Protection (Office Fédéral de la Protection de l'Environnement) [National organization]

- 288 International Institute for Environment and Development [National organization]
- 307 Scientific Documentation Centre Ltd [National organization]
- 329 Environment Information Centre [National organization]
- 349 Instituto Nacional para la Preservación del Medio Ambiente [National organization]
- 352 Institute of Information and Technical Research [National organization]
- 361 Centre de Documentation Pour le Programme de Développement du Bassin du Fleuve Sénégal [Regional organization]
- 371 European Centre of Information for Nature Conservation [Regional organization]
- 377 Economic and Social Commission for Asia and the Pacific [United Nations organization]
- 432 World Environment Handbook - a Directory of Government Natural Resource Management Agencies and Non-Governmental Environment Organizations in 145 Countries [Directory]
- 515 Natural Resource and Environmental Policy Analysis: Cases in Applied Economics [Handbook]

**New materials**

- 103 Federal Institute for Materials Research and Testing (Bundesanstalt für Materialforschung und -prüfung) [National organization]
- 335 Minerals, Metals & Materials Society [National organization]

**Noise**

- 252 British Glass Manufacturers Confederation [National organization]
- 516 Noise and the Steel Industry. [Handbook]
- 534 Noise & Vibration Bulletin [Journal]
- 765 Hearing Protection [Film]

**Nonferrous metals**

- 254 British Non-Ferrous Metals Federation [National organization]
- 699 British Non-Ferrous Metals Abstracts - BNF METALS [Database]

**North America**

- 418 IWED Guide to Waste Equipment Distributors [Directory]
- 433 World Environmental Directory, North America [Directory]

**Nutrition**

- 607 Essential and Toxic Trace Elements in Human Health and Disease [Proceedings]

**Occupational disease**

- 380 International Labour Organisation [United Nations organization]
- 407 Essential Publications on Occupational Safety and Health [Directory]
- 637 Philippines. Findings and Recommendations on Occupational Health Aspects of the Pesticide Regulatory Programme [Technical report]
- 731 NIOSH Exposure Data - NEDA [Database]
- 747 Air Sampling [Film]
- 755 Controlling Exposure to Toxic Substances [Film]
- 765 Hearing Protection [Film]

**Oceania**

- 599 Proceedings of the UNEP/ESCAP/FAO Workshop on Agricultural and Agroindustrial Residue Utilization in the Asian and Pacific Region [Proceedings]

**Oil spills**

- 779 Roving Report 8915B: Alaska: Oil Spill [Film]

**Ores**

- 446 Biotechnology of Metals Manual [Handbook]
- 649 Bacterial Leaching of Copper Ores - the Chilean Experience. [Technical report]

**Ozone layer**

- 006 Industry Cooperative for Ozone Layer Protection [International organization]
- 440 Action on Ozone [Handbook]
- 505 Le Ciel Déchiré: Pouvons-Nous Sauver la Couche d'Ozone? [Handbook]
- 519 Ozone Crisis: the 15-year Evolution of a Sudden Global Emergency [Handbook]
- 529 Scientific Assessment of Atmospheric Ozone [Handbook]
- 532 Stones in a Glass House: CFCs and Ozone Depletion [Handbook]
- 535 Technical Progress on Protecting the Ozone Layer [Handbook]
- 622 Ozone Depletion, Greenhouse Gases and Climate Change [Proceedings]
- 654 Economic Panel Report [Technical report]
- 658 Environmental Effects Assessment Report [Technical report]
- 671 The Ozone Layer [Technical report]
- 676 Scientific Assessment of Stratospheric Ozone [Technical report]

**Packaging**

- 027 Packaging Council of Australia [National organization]
- 205 Plastics and Rubber Research Institute TNO [National organization]

- 255 British Plastics Federation [National organization]
- 733 PAKLEGIS - PAKI. [Database]

**Paints and varnishes**

- 205 Plastics and Rubber Research Institute TNO [National organization]
- 302 Paint Research Association [National organization]
- 745 World Surface Coatings Abstracts [Database]

**Pakistan**

- 651 Pakistan. Consultation in Environmental Toxicology Related to Pesticides. Technical Report [Technical report]

**Paper**

- 631 Kenya. Advisory Service Mission by UNIDO to Chandaria Industries, Nairobi. Regarding the Proposed Paper Mill Project [Technical report]

**Patents**

- 321 American Petroleum Institute [National organization]
- 692 AGPAT [Database]
- 695 APIPAT [Database]
- 722 INPADOC [Database]
- 723 INPAMONITOR [Database]

**Pest control**

- 049 Forest Pest Management Institute [National organization]
- 152 Pesticides India Ltd. [National organization]
- 301 Natural Resources Institute [National organization]
- 464 Ecological Approach to Pest Management [Handbook]
- 692 AGPAT [Database]

**Pesticides**

- 005 Groupement International des Associations Nationales de Fabricants de Produits Agrochimiques [International organization]
- 041 Agriculture Canada Research Station Vancouver [National organization]
- 098 Bundesforschungsanstalt fuer Getreide- und Kartoffelverarbeitung [National organization]
- 144 Indofil Chemicals Ltd. [National organization]
- 152 Pesticides India Ltd. [National organization]
- 271 Environmental Research Group [National organization]
- 280 ICI Agrochemicals [National organization]
- 348 Western Agricultural Chemicals Association [National organization]
- 517 Normes pour les Pesticides Utilisés en Santé Publique: Insecticides, Molluscicides, Répulsifs, Méthodes d'Examen [Handbook]
- 585 Pesticides Abstracts [Journal]
- 609 Field Methods for the Study of Environmental Effects of



Pesticides [Proceedings]  
 623 Pesticide Residues in Food [Proceedings]  
 624 Pesticides: Food and Environmental Implications [Proceedings]  
 630 Technical Report of the Seminar on Environmental Aspects of Production and use of Pesticides [Proceedings]  
 637 Philippines. Findings and Recommendations on Occupational Health Aspects of the Pesticide Regulatory Programme [Technical report]  
 643 Poland. Toxicological and Environmental Aspects of Pesticide Registration [Technical report]  
 651 Pakistan. Consultation in Environmental Toxicology Related to Pesticides. Technical Report [Technical report]  
 661 Egypt. Establishment of a Multipurpose Pesticide Pilot Plant. Findings and Recommendations. Technical Report. [Technical report]  
 735 Pesticidal Literature Documentation - PESTDOC [Database]  
 748 The Ark: Missile Kills Hamlet [Film]  
 751 The Challenge of Survival: Chemicals [Film]  
 772 Our Chemical Future [Film]

**Petrochemical industry**

085 Information and Research Centre on Pollution (Centre d'Information et de Recherche sur les Nuisances) [National organization]  
 491 Guidelines for Vapor Release Mitigation [Handbook]

**Petrochemicals**

321 American Petroleum Institute [National organization]

**Petroleum**

063 Hydrobiology Institute Academia Sinica [National organization]  
 209 Unversum Enterprises Consultants on Environmental Controls [National organization]

**Petroleum industry**

009 International Petroleum Information for Environment and Conservation of Nature [International organization]  
 045 Canadian Petroleum Products Institute [National organization]  
 061 Empresa Nacional del Petroleo [National organization]  
 374 Oil Companies International Study Group for Conservation of Clean Air and Water - Europe [Regional organization]  
 399 Arab Oil and Gas Directory [Directory]  
 471 Environmental Code of Practice [Handbook]  
 476 Environmental Impact of Used Motor Oil [Handbook]  
 575 Hydrocarbon Processing [Journal]  
 694 APII.IT [Database]  
 695 APIPAT [Database]  
 758 Do You Ever Stop to Think [Film]  
 774 Perspective: Mayday! Mayday! [Film]  
 779 Rowing Report 8915B: Alaska: Oil Spill [Film]

781 The Safe Use of Cranes in the Offshore Industry [Film]  
 785 Survival: A Sheltered Existence [Film]

**Petroleum products**

264 Chem Systems International Ltd. [National organization]  
 321 American Petroleum Institute [National organization]

**Petroleum refinery**

165 Oil Refineries Ltd. [National organization]  
 683 Tools for Ambient Air Quality Management. Training Series on Environmental Technologies Promotion No. 1 [Technical report]

**Pharmaceutical industry**

640 Islamic Republic of Iran. Pharmaceutical Industrial Waste Treatment [Technical report]

**Pharmaceuticals**

139 Haffkine Institute for Training, Research and Testing (Pharmaceuticals) [National organization]  
 235 WHO Collaborating Centre for International Chemical Reference Substances [National organization]  
 278 Hazelton UK [National organization]  
 655 Environment Impact Analysis of the Manufacture of ....(series) [Technical report]

**Philippines**

637 Philippines. Findings and Recommendations on Occupational Health Aspects of the Pesticide Regulatory Programme [Technical report]

**Pilot plant**

661 Egypt. Establishment of a Multipurpose Pesticide Pilot Plant. Findings and Recommendations. Technical Report. [Technical report]

**Planning**

478 Environmental Perspective to the Year 2000 and Beyond [Handbook]  
 603 Emergency Planning for Industrial Hazards [Proceedings]

**Plastic foam**

536 Technical Progress on Protecting the Ozone Layer - Flexible and Rigid Foams - Technical Options Report [Handbook]

**Plastics**

205 Plastics and Rubber Research Institute INO [National

organization ]  
 583 Modern Plastics International [Journal]  
 586 Plastics and Rubber International [Journal]  
 587 Plastics World [Journal]  
 642 China. Recycling System for Plastic Wastes. Final Report.  
 [Technical report]  
 728 MATBUS [Database]

**Plastics industry**

255 British Plastics Federation [National organization]  
 279 IAL Consultants Ltd. [National organization]

**Poland**

643 Poland. Toxicological and Environmental Aspects of Pesticide Registration [Technical report]

**Pollutants**

492 Haushalt ohne Chemie [Handbook]  
 503 Krebswelt [Handbook]  
 670 Yugoslavia. Organic Toxic Pollutants. Mission Report  
 [Technical report]

**Pollution control**

013 International Union of Air Pollution Prevention Associations [International organization]  
 021 Ministère de l'Hydraulique, des Forêts et de la Pêche [National organization]  
 025 Australian Newsprint Mills Limited [National organization]  
 028 Versuchsanstalt fuer Lederindustrie [National organization]  
 029 Department of Environment [National organization]  
 032 Groupement Belge des Techniques et Equipements de Lutte Contre les Nuisances [National organization]  
 033 Information and Documentation Centre on Environment [National organization]  
 039 Commission on Environment Protection [National organization]  
 040 Institute for Instrument Design [National organization]  
 048 Environment Canada [National organization]  
 055 Ministry of Environment of Quebec [National organization]  
 057 Petro Canada [National organization]  
 067 Teknologisk Institut (Technology Institute) [National organization]  
 068 Centro de Desarrollo Industrial del Ecuador [National organization]  
 093 Training and Documentation Centre on Industrial Environment (Centre de Formation et de Documentation sur l'Environnement Industriel [National organization]  
 100 Environmental Law Information System [National organization]  
 108 Goepfert, Reimer & Partner [National organization]  
 116 Tuev Bayern Holding GmbH [National organization]

119 Untersuchungsstelle für Umwelttoxikologie Schleswig-Holstein [National organization]  
 123 Technical Chamber of Greece [National organization]  
 127 Institute for Environmental Protection [National organization]  
 133 Birla Research Institute for Applied Science [National organization]  
 138 Gujarat State Fertilizers Co. Ltd. [National organization]  
 139 Haffkine Institute for Training, Research and Testing (Pharmaceuticals) [National organization]  
 140 Harcourt Butler Technological Institute [National organization]  
 142 Indian Association for Water Pollution Control [National organization]  
 151 National Productivity Council [National organization]  
 152 Pesticides India Ltd. [National organization]  
 153 Regional Research Laboratory, Jorhat [National organization]  
 154 Society for Clean Environment [National organization]  
 155 Steam Boilers & Smoke Nuisances, Maharashtra State [National organization]  
 165 Oil Refineries Ltd. [National organization]  
 170 Environmental Pollution Research Centre [National organization]  
 175 Osaka City Institute of Public Health & Environmental Sciences [National organization]  
 181 Malta Human Environmental Council Library [National organization]  
 195 Hoogovens Group B.V. - IJmuiden [National organization]  
 201 Netherlands Central Bureau of Statistics [National organization]  
 204 Nutrition and Food Research TNC [National organization]  
 207 Volker Stevin Roads and Asphalt B.V. [National organization]  
 215 Environmental Pollution Abatement Centre [National organization]  
 219 Sulphur Industry [National organization]  
 220 Energy Research and Modernising Institute [National organization]  
 227 Consulting Engineers Ltd. [National organization]  
 228 Kjessler & Mannerstrale AB [National organization]  
 244 Agricultural and Food Research Council [National organization]  
 246 BCIRA: Environmental Consultancy Services [National organization]  
 254 British Non-Ferrous Metals Federation [National organization]  
 257 British Textile Technology Group [National organization]  
 258 British Textile Technology Group [National organization]  
 275 Foster Wheeler Energy Ltd. [National organization]  
 279 IAL Consultants Ltd. [National organization]  
 295 Mass Transfer International [National organization]  
 298 National Industrial Fuel Efficiency Service Ltd. [National organization]  
 311 Steel Castings Research and Trade Association [National organization]  
 313 Warren Spring Laboratory [National organization]

322 The Asphalt Institute [National organization]  
 324 Cambridge Scientific Abstracts [National organization]  
 374 Oil Companies International Study Group for Conservation of Clean Air and Water - Europe [Regional organization]  
 388 United Nations Environment Programme [United Nations organization]  
 402 Best's Safety Directory [Directory]  
 409 Directory of Federal Contacts on Environmental Protection [Directory]  
 416 International Pollution Control Directory: Eco-Technics [Directory]  
 420 National Society for Clean Air - Members' Handbook [Directory]  
 421 Directory of Pollution Control Equipment Companies in Western Europe [Directory]  
 422 Pollution Engineering - Environmental Yearbook and Product Reference Guide Issue [Directory]  
 423 Pollution Equipment News - Catalogue and Buyer's Guide Issue [Directory]  
 501 Innovative Strength of Indian Industry - Case of Environmental Technologies [Handbook]  
 548 Abstract Newsletter: Environmental Pollution & Control [Journal]  
 549 Air & Water Pollution Control [Journal]  
 551 Air Pollution Control Association Journal [Journal]  
 556 Asbestos Control Report [Journal]  
 565 Current Bibliography on Science and Technology: Environmental Pollution (Kagaku Gijutsu Bunken Sokuho Kankyo Kogai-Hen) [Journal]  
 566 Eco-Log Week [Journal]  
 588 Pollution Abstracts [Journal]  
 589 Pollution Equipment News [Journal]  
 590 Pollution Technology Review [Journal]  
 605 Environmental Contamination [Proceedings]  
 614 International Agenda for the 1990s [Proceedings]  
 618 Mediterranean Health-Related Environmental Quality Criteria [Proceedings]  
 619 Proceedings of the National Training Course on Industrial Pollution Control for Small and Medium Scale Industries [Proceedings]  
 631 Kenya Advisory Service Mission by UNIDO to Chandana Industries, Nairobi: Regarding the Proposed Paper Mill Project [Technical report]  
 632 Ecuador Assistance in Establishing an Environmental Laboratory to Control the Agro-Industrial Development in the Eastern Part of the Country. Terminal Report. [Technical report]  
 634 Yugoslavia Effect of Coal Composition on SO<sub>2</sub> Emissions from Kosovian Power Plants. Mission Report [Technical report]  
 635 India Environmental Control Management at Four Fertilizer Manufacturing Companies and Assistance with Environmental Problem Solving at Four others. Technical Report [Technical report]  
 636 India Environmental Simulation Models for Industrial Pollution Control. Technical Report [Technical report]  
 638 Czechoslovakia Low-Waste Technology in Selected Chemical Processes. Terminal Report [Technical report]  
 647 India Air Pollution Control. Technical Report [Technical report]

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 648 Applications of In-Line Flocculation-Ultra (Micro) Filtration [Technical report]  
 662 Syrian Arab Republic. High Level Consultancies and Training. Fertilizer Industry Pollution Control [Technical report]  
 669 Algeria. Mercury Cell Restoration Compared with Replacement by Membrane Cells [Technical report]  
 672 India. Pollution Control in Boilers [Technical report]  
 673 Proposal for Clean Technology Digest [Technical report]  
 677 SIPscope: Environmental Reporting (special issue) [Technical report]  
 678 India. Software Engineering in Environmental Pollution Control. Technical Report [Technical report]  
 683 Tools for Ambient Air Quality Management. Training Series on Environmental Technologies Promotion No. 1 [Technical report]  
 684 Republic of Korea. Toxicology Research Center. Animal Pathology. Technical Report [Technical report]  
 708 DE:QUIP [Database]  
 709 DE:TEQ [Database]  
 726 JICST File on Science and Technology: Environmental Pollution [Database]  
 739 Sludge Newsletter [Database]  
 744 World Environment Report [Database]

**Population**

016 Scientific Committee in Charge of Environment Programmes [International organization]  
 019 World Resources Institute [International organization]  
 177 Environment Protection Centre [National organization]  
 178 National Scientific and Technical Information Centre [National organization]

**Poverty**

524 Poverty and the Environment: Reversing the Downward Spiral [Handbook]

**Power generation**

486 The Formation of Stable Components in the Atmosphere due to Energy Production [Handbook]  
 625 Photovoltaic Safety [Proceedings]

**Product safety**

078 Centre Technique du Bois et de l'Ameublement [National organization]  
 103 Federal Institute for Materials Research and Testing (Bundesanstalt für Materialforschung und -prüfung) [National organization]  
 217 National Institute of Hygiene [National organization]  
 226 Association of Swedish Chemical Industries [National organization]  
 234 Swedish Gas Association [National organization]  
 243 AFRC Institute of Food Research [National organization]

325 Chemical Industry Institute of Toxicology [National organization]  
 327 Ecological & Toxicological Association of Dyestuffs Manufacturers Industry [National organization]  
 348 Western Agricultural Chemicals Association [National organization]

**Project evaluation**

665 First Guide for UNIDO Officers in Evaluating the Environmental Impact of Industrial Projects [Technical report]

**Public administration**

409 Directory of Federal Contacts on Environmental Protection [Directory]  
 425 Directory of Principal Governmental Bodies Dealing with the Environment [Directory]  
 426 Directory of State Environmental Agencies [Directory]  
 432 World Environment Handbook - a Directory of Government Natural Resource Management Agencies and Non-Governmental Environment Organizations in 145 Countries [Directory]  
 571 EPA Journal [Journal]

**Public relations**

309 Sheffield Centre for Environmental Research [National organization]

**Pulp and paper industry**

025 Australian Newsprint Mills Limited [National organization]  
 058 Pulp & Paper Research Institute of Canada [National organization]  
 079 Centre Technique du Papier [National organization]  
 080 Centre Technique Forestier Tropical [National organization]  
 115 Technische Hochschule Darmstadt Institut für Papierfabrikation [National organization]  
 133 Birla Research Institute for Applied Science [National organization]  
 196 Industrial Products and Services TNO [National organization]  
 276 Grace Service Chemicals: Grace Dearborn Ltd. [National organization]  
 333 Institute of Paper Science and Technology [National organization]  
 337 National Council of the Paper Industry for Air & Stream Improvement [National organization]  
 447 Biological Waste Water Treatment in the Finnish Pulp and Paper Industry [Handbook]  
 527 Pulp and Paper Chemistry and Chemical Technology [Handbook]  
 581 IPPFA Journal [Journal]  
 593 TAPPI Journal [Journal]  
 690 Abstract Bulletin of the Institute of Paper Chemistry -

**PAPERCHEM [Database]**

**Quality control**

487 GLP directives [Handbook]

**Raw material**

631 Kenya. Advisory Service Mission by UNIDO to Chandaria Industries. Nairobi, Regarding the Proposed Paper Mill Project [Technical report]

**Recovery**

002 Bureau International de la Récupération [International organization]

**Recycling**

002 Bureau International de la Récupération [International organization]  
 027 Packaging Council of Australia [National organization]  
 031 Belgian Solid Waste Association [National organization]  
 105 Forschungsvereinigung Automobiltechnik [National organization]  
 109 Hessische Landesanstalt für Umwelt [National organization]  
 115 Technische Hochschule Darmstadt Institut für Papierfabrikation [National organization]  
 164 Israel Desalination Engineering [National organization]  
 167 Clean Japan Center [National organization]  
 193 DSM Research Ltd. [National organization]  
 253 British Leather Confederation [National organization]  
 291 Kodak Ltd [National organization]  
 334 Institute of Scrap Recycling Industries Inc. [National organization]  
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 639 China. Modernization of Copper and Copper Alloy Scrap Processing in Shanghai. Final Report. [Technical report]  
 642 China. Recycling System for Plastic Wastes. Final Report. [Technical report]  
 664 Thailand. Advisory Assistance in Formulating a Programme for Waste Oil Recycling. Terminal Report. [Technical report]  
 752 Chemicals in the Community: Chemicals and the Environment [Film]  
 788 Watch Your Waste [Film]

**Regional cooperation**

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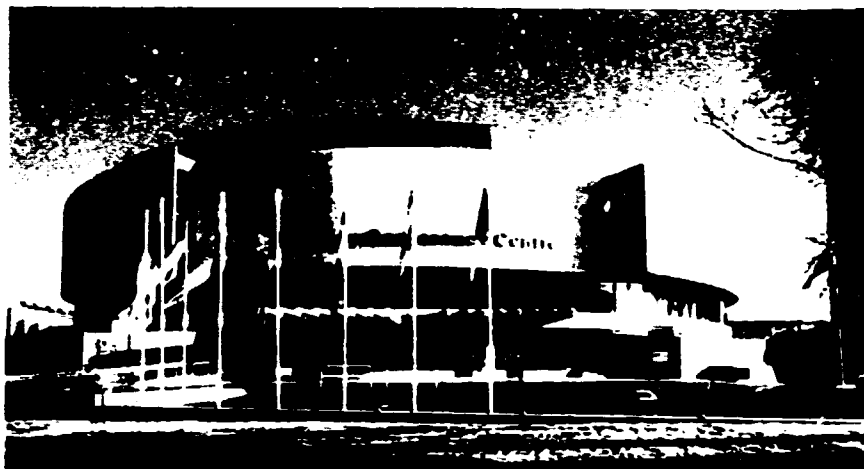
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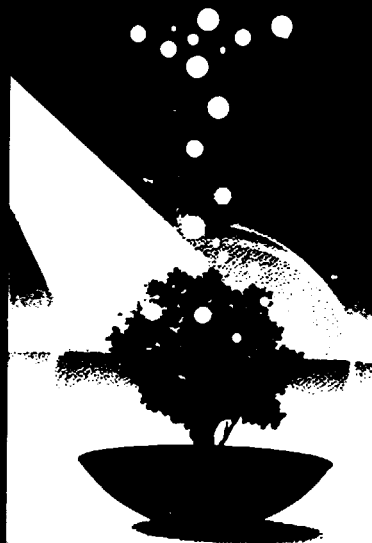
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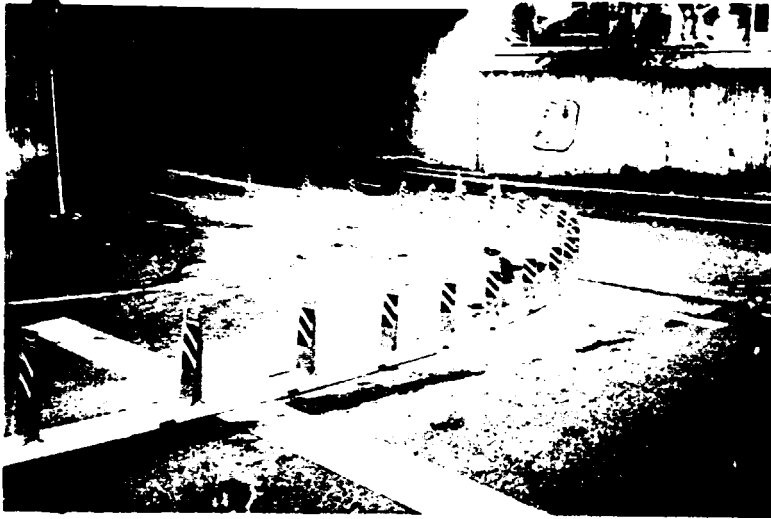
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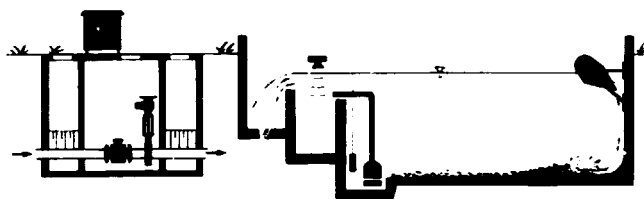
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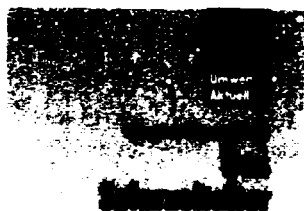
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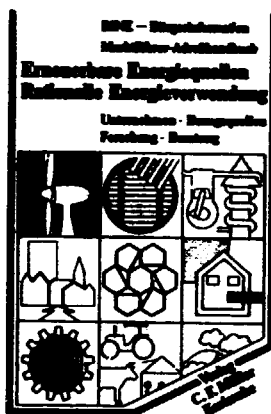
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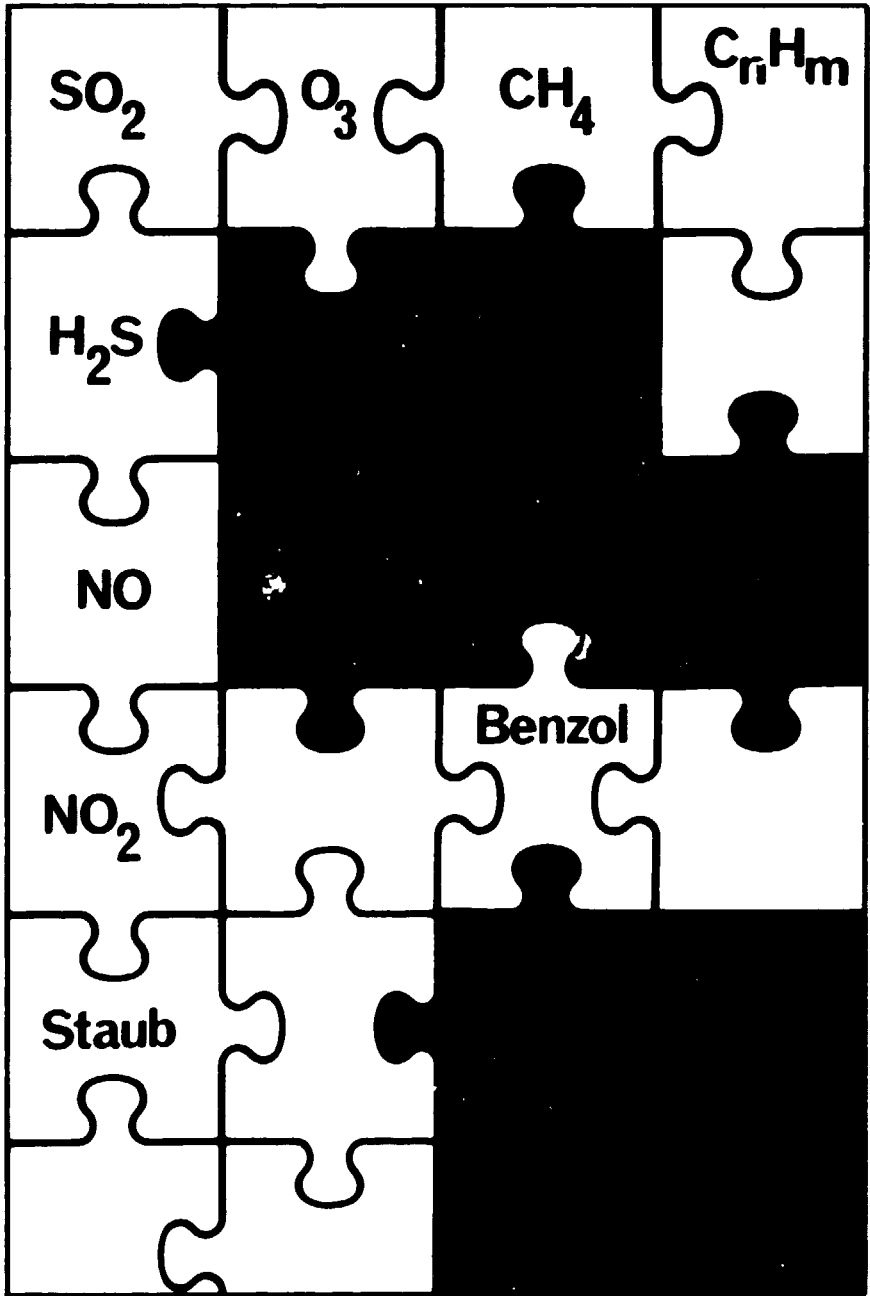
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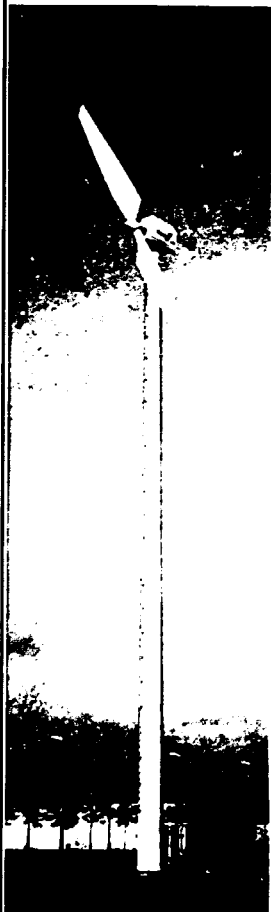
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B. A. U. M.'s work is based on the Integrated System of Environmental Management which incorporates all aspects of environmental management. This system is based on practical experience and has been published at the recommendation of the EC-Commission (Winter Ewers Gege, Business and the Environment, McGraw-Hill, Maidenhead UK, 1988). The book is also available in the original German, in French, Spanish and Swedish and is presently being translated into Danish, Norwegian, Polish and Portuguese.

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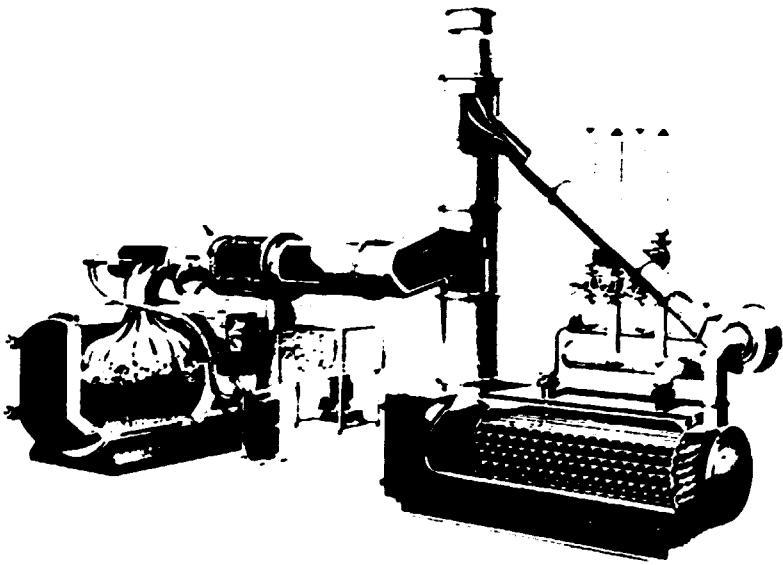


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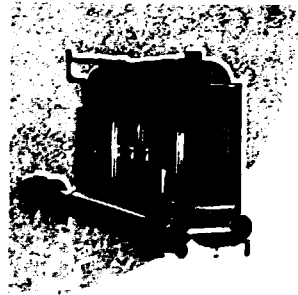
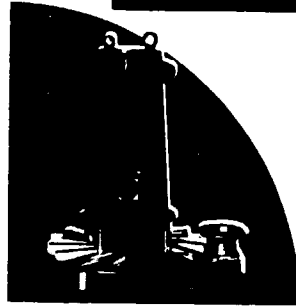
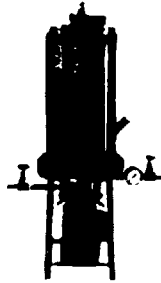
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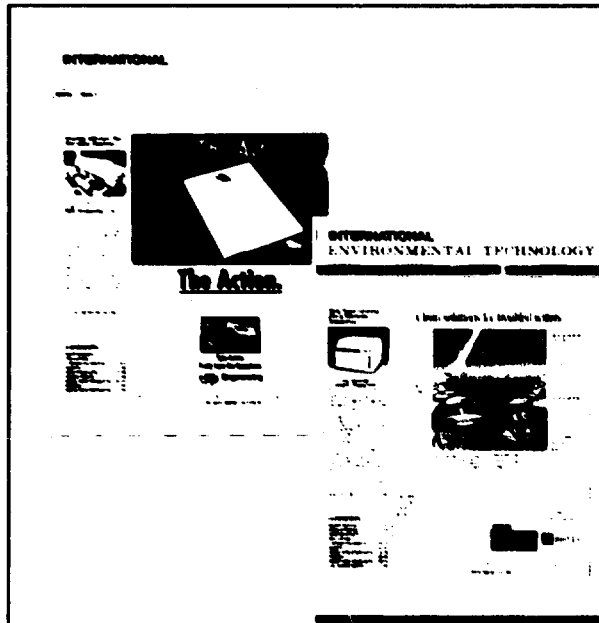
Our vegetable oil based lubricants, especially those based on rapeseed oil have the name "PLANTO". The PLANTO series offers the following advantages over mineral oils: The same quality as mineral oil based products, biodegradability and as a rule, non-water polluting. At present the series comprises of 13 different products including hydraulic oils, 2 stroke oils and various greases.



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