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Interpreting & Implementing

ISO 14001:2004

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These documents provide an outline of a presentation, and are incomplete without the accompanying oral commentary and discussion.

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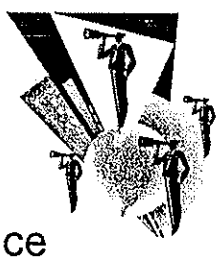
Interpreting & Implementing ISO 14001:2004

Why set-up an EMS



- Cost reduction
- Image enhancement
- Customer / Client demand
- Investors' demands
- Insurance
- Demonstration of due diligence



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Benefits of ISO 14001 EMS

- ☑ Lower operating cost
- ☑ Lower insurance premiums
- ☑ Minimize waste
- ☑ Reduce the risk of litigation
- ☑ Promote energy conservation
- ☑ Utilisation and recoverable resources
- ☑ Improve operational efficiency





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What you can do to protect the environment?

- ➤ Turn off lights, air-con, equipment when not in use.
- ➤ Save water.
- ➤ Use as little of everything as possible.
- ➤ Buy products that use less packaging (e.g. re-fill).
- ➤ Avoid disposable items (e.g. paper plates).
- ➤ Try to reduce waste. Buy what you need.
- ➤ Dispose of waste at the right segregated bin.
- ➤ Use less chemicals.
- ➤ Use less, and re-use paper.
- ➤ Give your best in your work – reduce scrap and waste.





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Terms & Definitions

- **Auditor**
  Person with the competence to conduct an audit.

- **Continual improvement**
  Recurring process of enhancing the environmental management system in order to achieve improvements in overall environmental performance consistent with the organisation's environmental policy.

- **Corrective action**
  Action to eliminate the cause of a detected nonconformity.

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Terms & Definitions

- **Document**
  Information and its supporting medium.

- **Environment**
  Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

- **Environmental aspect**
  Element of an organisation's activities or products or services that can interact with the environment.

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Terms & Definitions

- **Environmental impact**
  Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.

- **Environmental Management System**
  Part of an organisation's management system used to develop and implement its environmental policy and manage its environmental aspects.

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Terms & Definitions

- **Environmental Objective**
  Overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.

- **Environmental Performance**
  Measurable results of an organisation's management of its environmental aspects.

- **Environmental Policy**
  Overall intentions and direction of an organisation related to its environmental performance as formally expressed by top management.

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Terms & Definitions

- **Environmental Target**
  Detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
- **Interested Party**
  Person or group concerned with or affected by the environmental performance of an organisation.
- **Internal Audit**
  Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the environmental management system audit criteria set by the organisation are fulfilled.

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Terms & Definitions

- **Nonconformity**
  Non-fulfilment of a requirement.
- **Organization**
  Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.
- **Preventive Action**
  Action to eliminate the cause of a potential nonconformity.

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Terms & Definitions

- **Prevention of Pollution**
  Use of processes, practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts.
- **Procedure**
  Specified way to carry out an activity or a process.
- **Record**
  Document stating results achieved or providing evidence of activities performed.

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ISO 14001 EMS Model



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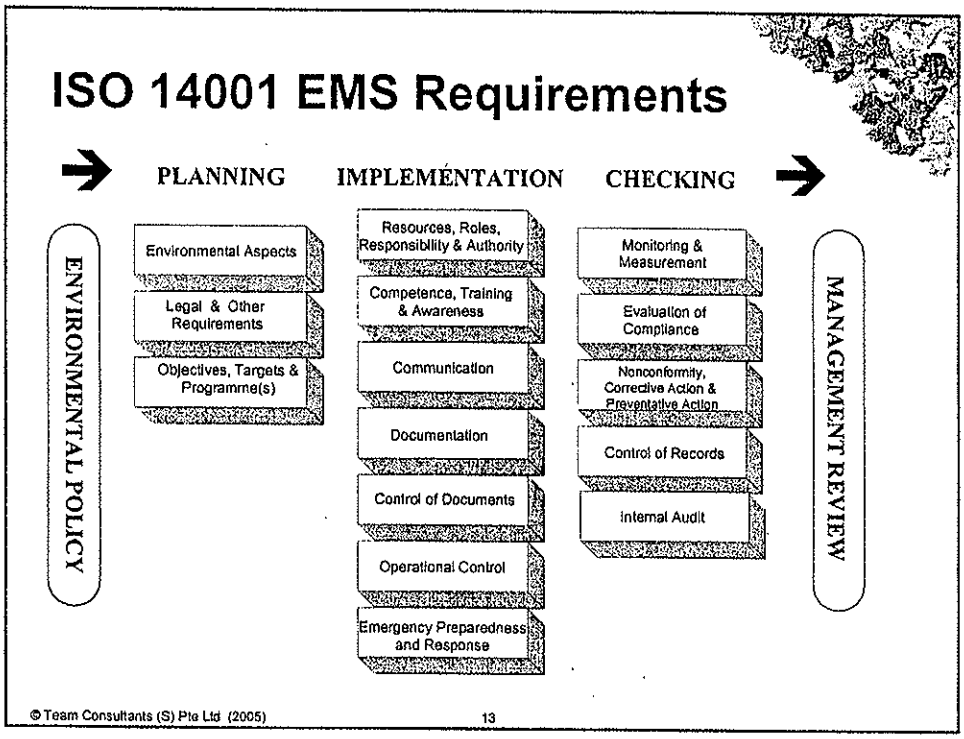

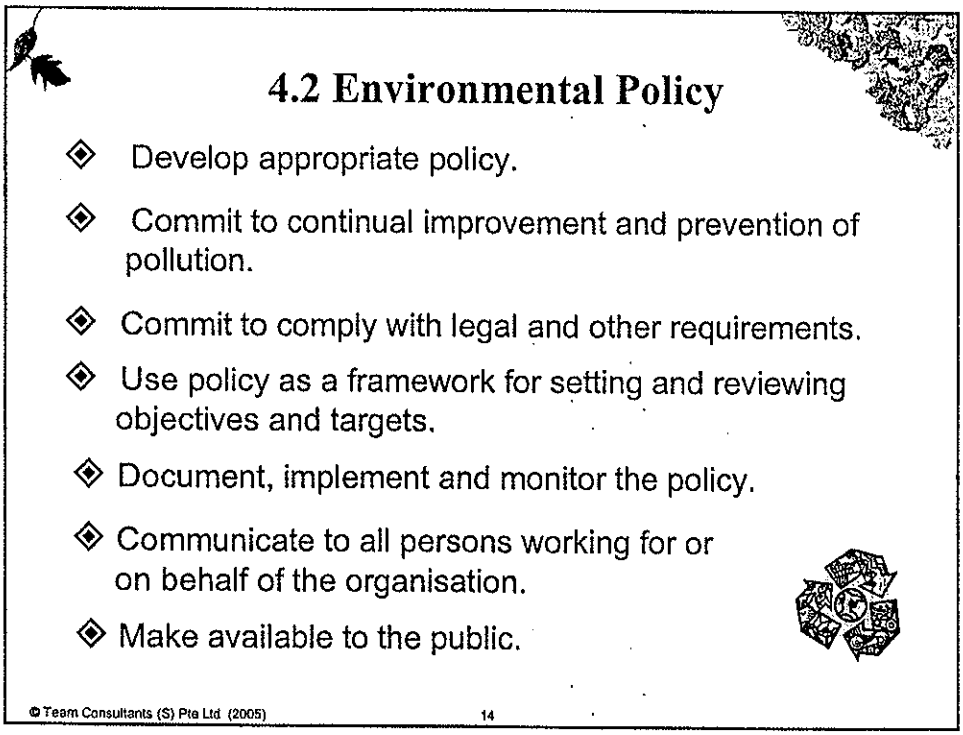

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4.3 Planning
4.3.1 Environmental Aspects

⇨ Identify environmental aspect of activities, products & services within the defined scope of the EMS taking into account planned or new developments or new or modified activities, products & services.

⇨ Determine those that have or can have a significant impact on the environment.

⇨ Keep information documented and up-to-date.

⇨ Ensure significant aspects are taken into account when establishing, implementing and maintaining the EMS.



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4.3 Planning
4.3.2 Legal & Other Requirements

⇨ Identify and have access to legal and other requirements to which the organization subscribes related to its environmental aspects.



⇨ Determine how the requirements apply to its environmental aspects.

⇨ Take into account legal and other requirements when establishing, implementing and maintaining the EMS.



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4.3 Planning
4.3.3 Objectives, Targets & Programme (s)

- Establish, implement and maintain at relevant functions and levels.



- Ensure objectives and targets are measurable and consistent with the environmental policy.
- Define responsibility for achieving objectives & targets.
- Define the means and time-frame.





Consider relevant :
- Legal requirements
- Other requirements
- Technological options
- Financial requirements
- Operational requirements
- Business requirements
- Environmental aspects
- Views of interested parties

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4.4 Implementation & Operation
4.4.1 Resources, Roles, Responsibility & Authority

- Ensure availability of resources, including human resources and specialized skills, organisational infrastructure, technology & financial resources.
- Define, document & communicate roles, responsibilities & authorities.
- Appoint a Management Representative to ensure:
  - EMS establishment, implementation & maintenance according to the International Standard
  - Reporting the EMS performance and recommendations for improvement.



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4.4 Implementation & Operation
4.4.2 Competence, Training and Awareness

- Ensure personnel performing tasks for or on behalf of the organization are competent on the basis of education, training or experience and associated records are retained.
- Identify and provide training or take other action, and retain associated records.
- Ensure employees know the importance of conformity with the environmental policy, procedures and EMS requirements.



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4.4 Implementation & Operation
4.4.2 Competence, Training and Awareness

- Ensure employees know the significant environmental aspects and related actual or potential impacts associated with their work.
- Ensure employees know their roles & responsibilities.
- Ensure personnel know the potential consequences of departure from specified procedure.



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4.4 Implementation & Operation
4.4.3 Communication

- Establish procedures for internal communication among various levels and functions.
- Establish procedures to receive, document and respond to relevant communications from external interested parties.
- Decide whether to communicate externally about its significant environmental aspects, and document its decision.



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4.4 Implementation & Operation
4.4.4 Documentation



- **EMS Documentation** shall:
  - Include environmental policy, objectives and targets.
  - Describe the scope of the EMS.
  - Describe the main elements of the EMS, their interaction and reference to related documents.
  - Include documents required by the ISO 14001 Standard.



  - Include documents necessary to ensure effective planning, operation and control of processes.

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4.4 Implementation & Operation
4.4.5 Control of Documents

- **Establish, implement and maintain procedures** to:
  - Approve documents for adequacy prior to use.
  - Review and update as necessary and re-approve documents.
  - Ensure changes and current revision status of documents are identified.
  - Ensure relevant versions of applicable documents are available at points of use.
  - Ensure documents are legible & identifiable.
  - Identify and control the distribution of documents of external origin.
  - Prevent the unintended use of obsolete documents.

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4.4 Implementation & Operation
4.4.6 Operational Control

- Identify operations with significant environment aspects.
- Establish, implement and maintain a documented procedure(s) to control situations.
- Stipulate operating criteria in procedures.
- Identify significant aspects goods & services used by the organisation.
- Communicate applicable procedures & requirements to suppliers, including contractors.

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4.4 Implementation & Operation
4.4.7 Emergency Preparedness & Response

- Identify potential emergency situations & potential accidents.
- Respond to actual emergency situations and accidents and prevent or mitigate adverse impacts.
- Review and, where necessary, revise the procedure, in particular, after the occurrence of accidents or emergency situations.
- Test such procedure(s) where practicable.



Emergency

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4.5 Checking
4.5.1 Monitoring & Measurement

- Monitor & measure key process characteristics of operations that can have a significant impact.
- Document information to monitor performance, applicable operational controls and conformity with objectives and targets.
- Ensure calibrated or verified monitoring and measurement equipment is used and associated records are retained.



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4.5 Checking
4.5.2 Evaluation of Compliance

- Evaluate compliance with applicable legal and other requirements
- Keep records of evaluation



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4.5 Checking
4.5.3 Nonconformity, Corrective Action & Preventive Action

- Establish, implement and maintain procedures defining requirements that:
  - Identify and correct nonconformities and take action to mitigate their environmental impacts.
  - Investigate and determine cause of nonconformity.
  - Evaluate the need for action(s).
  - Record results of corrective and preventive action(s) taken.
  - Review effectiveness of actions taken.
- Ensure necessary changes are made the EMS documentation.



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4.5 Checking
4.5.4 Control of Records

- Establish and maintain records to demonstrate conformity to requirements of the EMS, the International Standard and the results achieved.
- Establish procedures for identification, storage, protection, retrieval, retention and disposal of records.
- Ensure records are legible, identifiable & traceable





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4.5 Checking
4.5.5 Internal Audit

- Establish & maintain programme & procedures for audits at planned intervals.
- Ensure EMS conforms to planned arrangements.
- Ensure EMS is properly implemented & maintained.
- Provide information on results of audits to management.
- Prepare audit programme, showing schedule, scope, frequency & responsibilities taking into consideration the importance of operations(s) and the results of previous audits.
- Ensure the objectivity and impartiality of the audit process.



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4.6 Management Review



- Determine intervals for review.
- Ensure continuing suitability, adequacy & effectiveness.
- Assess opportunities for improvement & the need for changes to the EMS.
- Retain records of management review.

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4.6 Management Review

Input to management reviews shall include:

- results of internal audits and evaluations of compliance with legal and other requirements.
- communication(s) from external parties.
- environmental performance.
- extent to which objective and targets have been met.
- status of corrective and preventive actions.

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4.6 Management Review

Input to management reviews shall include:

- follow-up actions from previous management reviews.
- changing circumstances, including developments in legal and other requirements related to its environmental aspects.
- recommendations for improvement.

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4.6 Management Review

Output to management reviews shall include:

- any decisions and actions related to possible changes to environmental policy.
- objectives, targets and other elements of the EMS, consistent with the commitment to continual improvement.

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FOR YOUR ATTENTION



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APPENDIX

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Ecological Circle 自然界中的循环

- Everything on Earth is linked.

  自然万物息息相关
- Environmental threats will break the links unless we do something about it.

  人类应采取行动防止环境破坏

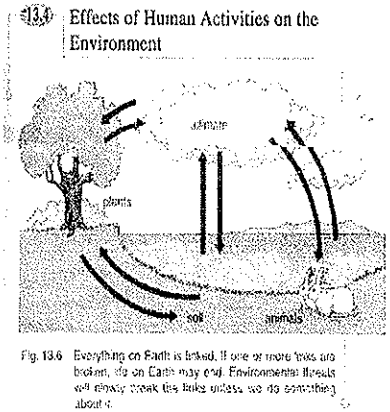

Fig. 13.6 Everything on Earth is linked. If one or more links are broken, life on Earth may end. Environmental threats will slowly break the links unless we do something about it.

Composition of Air 大气的组成

- **Many years ago, there were very little Oxygen on Earth.**

  远古时代，大气中仅含微量氧气
- **Over the years, photosynthesis has greatly increased the amount of Oxygen in the air.**

  植物的光合作用才使得氧气增加

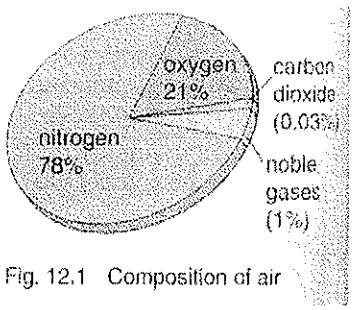

Fig. 12.1 Composition of air

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Thinning of the Ozone Layer
臭氧层变薄

- **Ozone layer absorbs harmful ultraviolet rays of the Sun.** 臭氧层可以吸收有害的紫外光
- **CFCs are broken down by ultraviolet rays to release free halogen which react with ozone and make its layer thinner.** 氟利昂在紫外线作用下产生的卤素自由基会破坏臭氧层

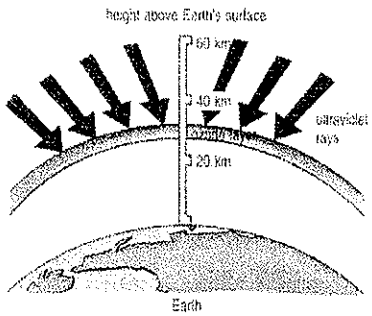
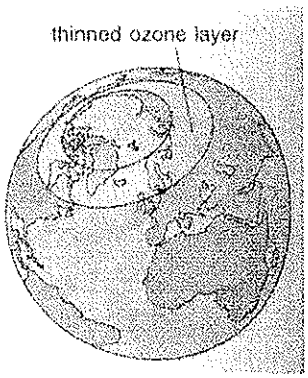


Fig. 13.10 The ozone layer prevents most of the ultraviolet rays from entering the Earth.

Ozone Layer Over the Antarctica
南极洲上空的臭氧层

- **When ozone layer becomes thinner, more ultraviolet rays from the Sun reaches Earth.** 臭氧层变薄使近地层紫外线增加
- **Ultraviolet rays damage crops and plants, and cause skin cancer and cataracts.** 紫外线会损伤农作物和植物，还会引发皮肤癌



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Air Pollutants 大气污染物

Main pollutants produced by **HUMAN ACTIVITIES** are:
人类活动产生的主要污染物：

- Sulphur dioxide **SO_2**
- Oxides of nitrogen **NO_x**
- Carbon monoxide **CO**
- Carbon Dioxide **CO_2**
- Particles 颗粒物
- Lead compounds **Pb** 铅
- Chlorofluorocarbons **CFCs**

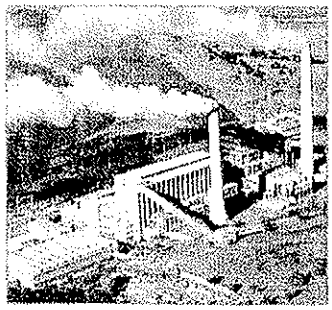
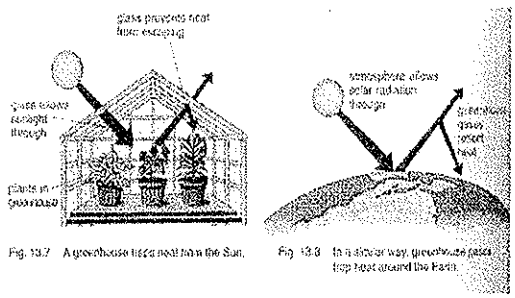


Fig. 13.2 Smoke from power stations usually contains sulphur dioxide.

Greenhouse Effect and Global Warming
温室效应与全球气候变暖

- **A greenhouse is made of glass. It traps heat from the Sun to keep plants warm.**
  温室的玻璃起到对植物保温的效果



- **Greenhouse Effect : Greenhouse gases in the atmosphere act like the glass of a greenhouse by letting in sunlight and preventing the heat given off from escaping back into space.**
  温室效应：温室气体在大气中起到类似温室 玻璃的效果，使得进入地表的阳光难以返回 大气空间。

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Greenhouse Gases 温室气体

- **Greenhouse gases may be generated from natural source, e.g. volcano.**

温室气体可以由自然活动产生，如火山喷发。

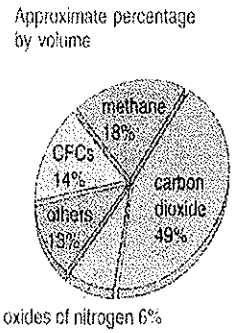


Fig. 13.9 Greenhouse gases in the atmosphere

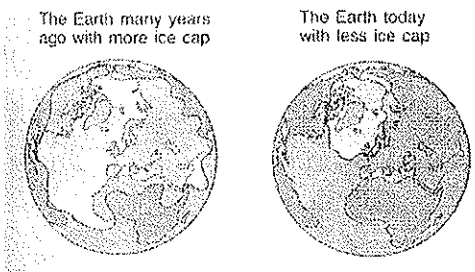
- **Human activities are upsetting the balance of these gases, causing global warming.**

人类活动破坏了自然中气体的平衡，引起全球变暖。

Global Warming 全球变暖

- **Large quantities of CO_2 are generated when fossil fuels are burnt.**

燃烧矿物能源可以产生大量CO_2



- **Average temperature of the Earth rises up which has resulted in the melting of the ice cap.**

地球平均气温的升高已经引起冰盖融化

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Acid Rain 酸雨

- **Acidic gases (SO_x, NO_x) emitted from burning of fossil fuels and motor vehicle exhausts may cause Acid Rain when dissolved by rain water.**

燃烧矿物能源及机车尾气排放的酸性气体(SO_x, NO_x)溶于雨水中可形成酸雨



Fig. 13.11 The effects of acid rain

- **Acid rain may do harm to fish, trees and buildings.**

酸雨可对鱼类，树木，建筑等造成伤害

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