

THE STATE OF THE ENVIRONMENT COOKBOOK

A cartoon summary

*Recipes for popular,
visually appealing and
indicator-based state
of the environment
reports that motivate
readers to act*





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The State of the Environment Cookbook. A cartoon summary. Recipes for popular, visually appealing and indicator-based state of the environment reports that motivate readers to act.

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INTRODUCTION

ENVIRONMENTAL information is more relevant and necessary today than it was twenty years ago when the 1992 United Nations Conference on Environment and Development in Rio de Janeiro stimulated the rise of official national and international reporting on the environment. In the days before the Internet, finding official reports, facts and figures on the state of the environment was not always easy, but today we face the opposite problem – information overload and an overabundance of sources. Even so, environmental information is not always presented in a clear and visually appealing way and may not be up-to-date and credible. This situation is a pity because information presented in environmental reports might be useful for a variety of purposes from motivating citizens to take action to the development of strategic governmental policies.

In order to have a quality environmental report that meets the expectations of its readers, it is important to establish who those readers are. After identifying the target audiences, the report developers can establish contacts with the main users and holders of the relevant environmental information. Regular communication among colleagues and with the target audiences is essential, as is engagement with the public.

The preparation of the report entails the identification of contributors and collaborators, and the development of a suitable cooperation process such as regular meetings of a working group or the periodic collection of information from key data suppliers. In some cases, high-level approval of report preparation processes and contents may be needed.

The report preparation team should include specialists in environmental issues, data processing and analysis and graphic design as well as a manager to assign and supervise work tasks and to coordinate the compilation and editing of the report. Although some tasks may be outsourced, your team should have its own specialists with competencies in environmental analysis and data synthesis, and in graphic design.

The needs of your audience should determine the contents of your state of the environment report: what environmental problems in your country are of greatest interest to your audiences? The availability of data may limit the report to a certain extent but should not determine the scope or focus of the report. In any case, the preparation of the report will reveal any data gaps and guide the improvement of environmental monitoring and the compilation of statistics.

Comparisons with neighbouring countries and the region as a whole are useful, and much easier if the structure of the report follows international practice and contains commonly accepted indicators.

The report should be concise, easy to read and user-friendly, and present key messages that non-specialists will find easy to grasp. For experts interested in specific questions or raw data, provide annexes with more detailed information, links to Internet sources and the contact details of data holders.

Content and structure

SOME countries strictly regulate the content of state of the environment reports, but even in such cases the reports should remain dynamic, evolving along with the environmental conditions, challenges and needs of the users. Use a conventional set of environmental themes as the core of the report, and adjust the themes to local priorities and the availability of data. Include chapters devoted to economic sectors that have a significant impact on the environment and that may be instrumental in solving environmental problems.

Indicators are widely used in the development of state of the environment reports. The changes in indicator values are representative of changes in environmental conditions, and the presentation of these values can offer a visual demonstration of what is happening in the environment. Where changes in the indicator values are the result of human activity, the analysis of these changes can put parameters on the significance of their impact and may point the way to the development of response measures.

Develop and keep a description of each indicator including information about the source of data, characteristics on the data quality and volume, other reference features, real and standard values of the indicators and ideas for graphic design.

As far as possible present indicators as ratios: emissions per unit of GDP, per capita and per area provide a better understanding of an emission source than just total emissions for that source. Similarly, the proportion of a population with centralized water supply is a much more informative indicator than simply the volume of treated water.

Use existing sets of indicators and propose specific ones for your country, river basin or locality. In general, the report should follow the DPSIR cause-and-effect scheme.

Having completed a detailed outline of the report, start collecting data from published sources and directly from the data holders and suppliers of environmental information. Many countries have made significant progress in the use of shared environmental information systems and in the publication of indicators in internationally accepted formats online. Such systems make data collection much easier. Where these systems are unavailable, find out what data are available and where they are stored.

The editing team and experts should develop a text that will become the electronic and printed versions of the report. As a rule, each chapter should contain:

- A clear and concise evaluation and analysis of the state and trends of the problem, supported with visual material when possible
- Sections on DPSIR consisting of text, indicators, illustrations and links to source data and other sections

The online version

WHEN viewing Internet websites, a user's attention is often drawn first to the visuals and headlines and then to the main text. Editors and publishers understand the power of an image, and invest in the development of high quality graphics that can attract the attention of readers. Clear graphics, maps and diagrams help readers grasp the main points. Carefully thought through and well-designed graphics may not only convince the user of the authoritativeness of the information being presented, but spark an interest in studying the text in more detail. The success of the visuals is dependent on following the basic principles of graphic design and on maintaining consistency in graphical representation.

Once data are collected and analysed they are passed over to a specialist on graphic design and cartography for further interpretation and visual presentation. Data and other information should be transformed into clear images with straightforward messages, and contain about 4-5 elements. In some cases maps will be the most suitable option, and in others graphics might be more appropriate. The graphical presentation of information varies according to the nature and type of data being visualized.

Examples include:

- Trends over time: line graph
- Proportions of various features: pie graph or bar chart
- Comparisons of absolute values: block diagrams
- Maps with absolute values: proportional figures (circles or squares)
- Maps with relative values: shading or colour options

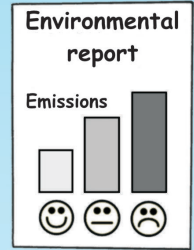
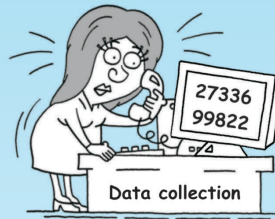
The success of the online version of your report will to a large extent be determined by how well the qualitative presentation of information matches the expectations and the technical capacities of the users. A logical website structure facilitates navigation. The organization of the sections, headlines and visuals should be consistent, clear and attractive. Simple, yet informative and well-prepared visuals and brief textual overviews will help users navigate confidently through the large amounts of information. In the modern world of mobile access to the Internet, it is essential to have website versions adapted to mobile devices that have small displays.

PREPARING THE REPORT: STAGES AND PARTICIPANTS

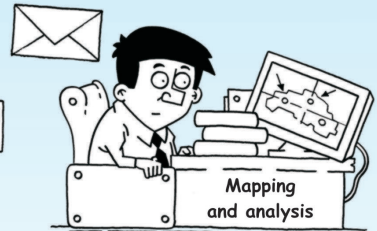
Data suppliers



Analysis and report preparation

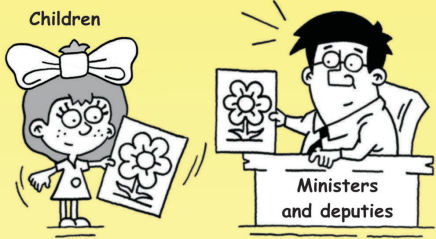


Quality control

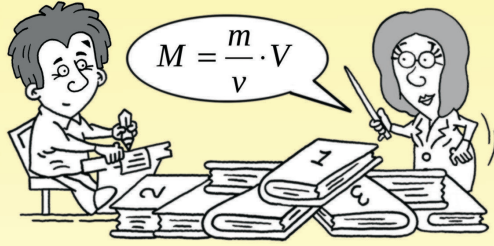


Report users

Children



Officials and experts

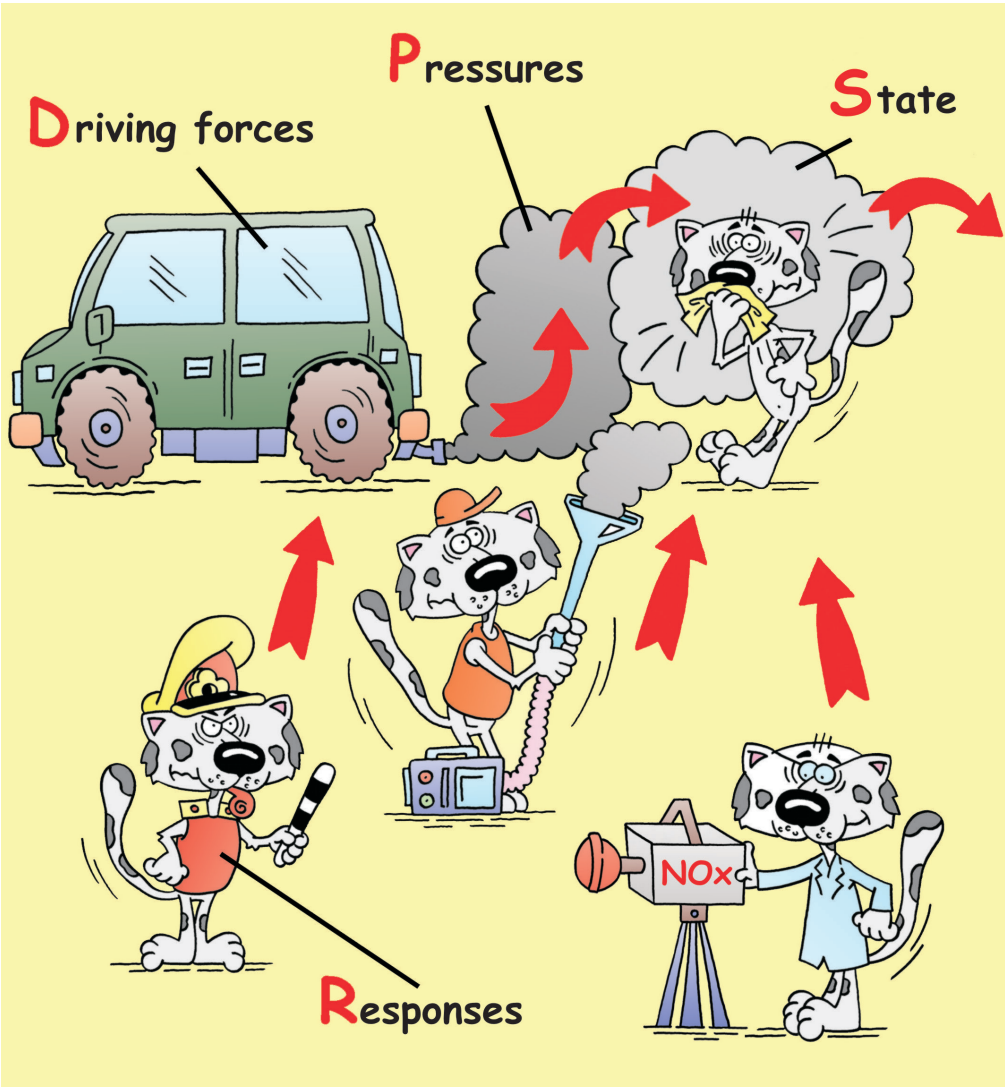


Scientists and students

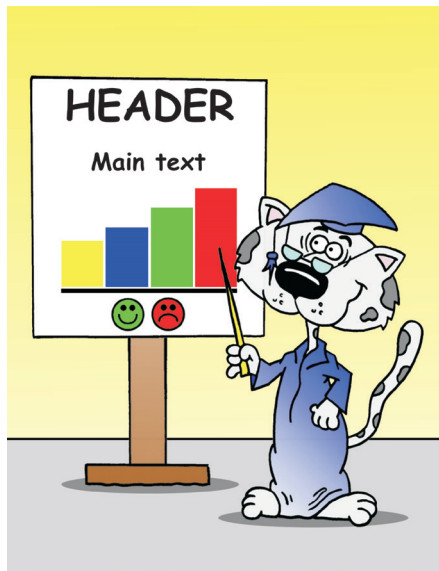
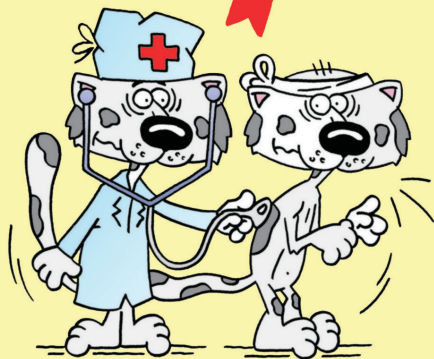
Report applications



THE CAUSE-AND-EFFECT PRINCIPLE AND REPORT CONTENTS

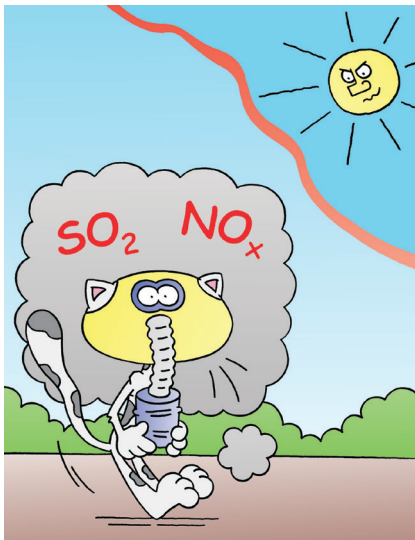


Impacts



- ✓ Use the cause-and-effect principle to describe key environmental themes: Driving Forces – Pressures – State – Impacts – Response
- ✓ Make sure that sections and key themes are easy to find, and reflect local and international priorities regarding the use of indicators, summaries, links and additional information
- ✓ Present the information in several layers with a good balance between the text and illustrations

ENVIRONMENTAL THEMES AND INDICATORS



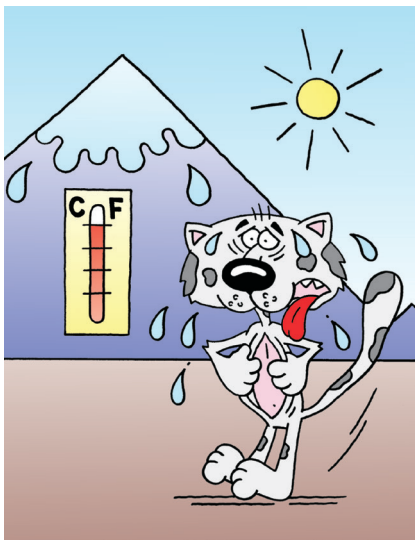
Air pollution and ozone depletion

A1. Emissions of pollutants into the atmospheric air: SO_2 , NO_x , CO, ammonia, hydrocarbons, heavy and toxic metals and other pollutants: emissions per area, per capita and per unit of GDP

A2. Ambient air quality in urban areas: Concentrations of dust (PM10), ozone, SO_2 , NO_x , and other pollutants; and number of days exceeding daily limit value

A3. Consumption of ozone-depleting substances: Chlorofluorocarbons (CFC) and other substances listed in the Montreal Protocol

Other indicators: Population in the urban area exposed to air pollution, air pollution index (API)

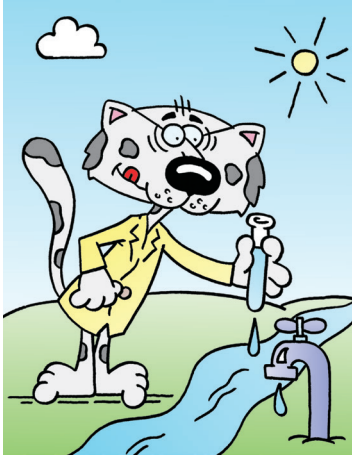


Climate change

B1. Air temperature: Norm 1961 – 1990, average annual temperature, deviation of average annual temperatures from the norm, minimum monthly average temperature, maximum monthly average temperature – country as a whole and for specific stations

B2. Atmospheric precipitation: Norm 1961-1990, annual precipitation, deviation of the annual precipitation from the norm in per cent, minimum monthly precipitation, maximum monthly precipitation – country as a whole and for specific stations

B3. Greenhouse gas emissions: By gas, expressed in CO_2 equivalents - CO_2 , N_2O , CH_4 , HFC, PFC, SF_6 , absorption in land use and forests; by categories – energy, industrial processes, agriculture, land use and forestry, waste; emissions per area, per capita and per unit of GDP



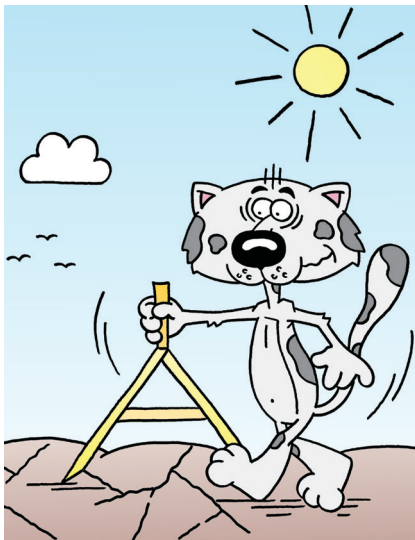
Water

- C1. Renewable freshwater resources:** Balance of water resources
C2. Fresh water abstraction: Abstraction from surface and ground sources
C3. Total water use: Consumption of available water resources in total and by types of economic activity – industry, agriculture, household, other
C4. Household water use per capita
C5. Water supply industry and population connected to water supply industry
C6. Connection of population to public water supply
C7. Water losses
C8. Reuse and recycling of freshwater
C9. Drinking water quality: Number of samples exceeding chemical and bacteriological pollution standards
C10. BOD and concentration of ammonium in rivers: Names of rivers and sampling sites, number of samples per year, maximum, minimum and mean concentrations
C11. Nutrients in fresh water: Names of rivers and sampling sites, number of samples per year, maximum, minimum and mean concentrations
C12. Nutrients in coastal seawaters: Names of coastal areas and sites of sample collection, number of samples, minimum, maximum and mean concentrations
C13. Concentrations of pollutants in coastal seawater and sediments: Number of samples and mean concentrations of organic pollutants, pesticides, heavy metals, etc.
C14. Population connected to wastewater treatment
C15. Wastewater treatment facilities: Number of wastewater treatment facilities, their design and actual capacity for primary, secondary and tertiary wastewater treatment; overall volume of treated wastewaters
C16. Polluted (non-treated) wastewaters



Biodiversity

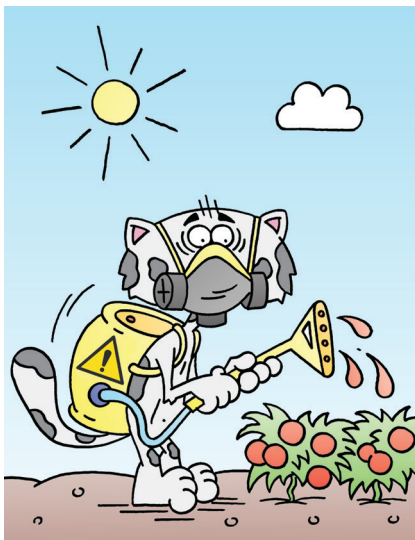
- D1. Protected areas:** Area of various types of protected areas according to IUCN categories (I–VI) and national categories; share of protected areas of country's territory
D2. Biosphere reserves and wetlands of international importance
D3. Forests and other wooded land: Area of forests and other wooded lands, total area of forest plantations, share of forests of country's territory; area and share of primary and planted forests; forests within protected areas; other protected forests with soil and water conservation functions
D4. Threatened and protected species: Number of species by vulnerability groups and classes mammals, birds, fish, reptiles, insects
D5. Trends in the number and distribution of selected species: Number of individuals for flagship, endemic and other species
D6. Invasive alien species



Land and soil

E1. Land uptake: Area of land uptake for various activities (mining and quarrying, waste disposal, recreation, etc.) and total

E2. Area affected by soil erosion: Extent of water and wind erosion



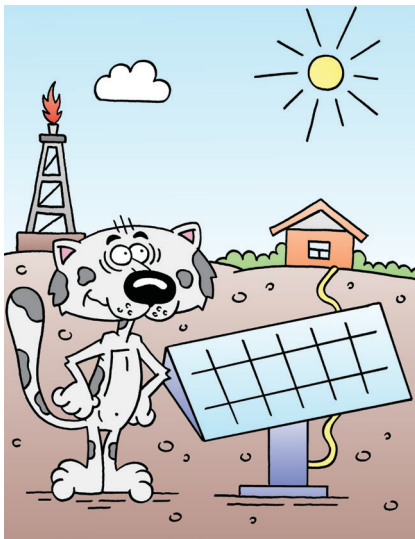
Agriculture

F1. Irrigation

F2. Fertilizer consumption: Consumption of mineral (nitrogen, phosphate and potassium) and organic fertilizers in total and by types of crops

F3. Gross nitrogen balance

F4. Pesticide consumption: Consumption of agrochemicals in tonnes and kilo per hectare of cultivated land in total and by types (insecticides, herbicides, etc.)



Energy

G1. Final energy consumption: Consumption in tonnes of oil equivalent in total and by main sectors (industry, transport, residential sector)

G2. Total primary energy supply: Production, import, export, total and by type of energy source (coal, oil, gas, hydropower, etc.)

G3. Energy intensity: Per unit of GDP

G4. Renewable energy consumption: Share in total energy consumption and consumption volume by type of energy source (solar, wind, hydro, etc.)

G5. Final electricity consumption

G6. Gross electricity production



Transport

H1. Passenger transport demand: Total and by transport type

H2. Freight transport demand: Total and by transport type

H3. Composition of road motor vehicle fleet by fuel type

H4. Age of road motor vehicle fleet



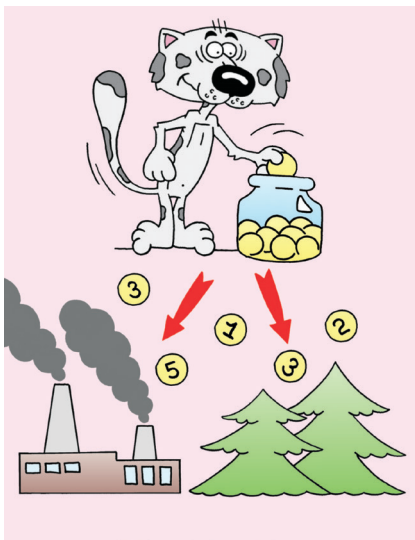
Waste

11. Waste generation: Total and by type of economic activity in tonnes; generation of household waste per capita and waste generated by economic activity per unit of GDP

12. Management of hazardous waste: Amount of accumulated hazardous waste, annual generation of hazardous waste, import and export; disposal options

13. Waste reuse and recycling: Total and by waste type – household, non-toxic, industrial, hazardous industrial

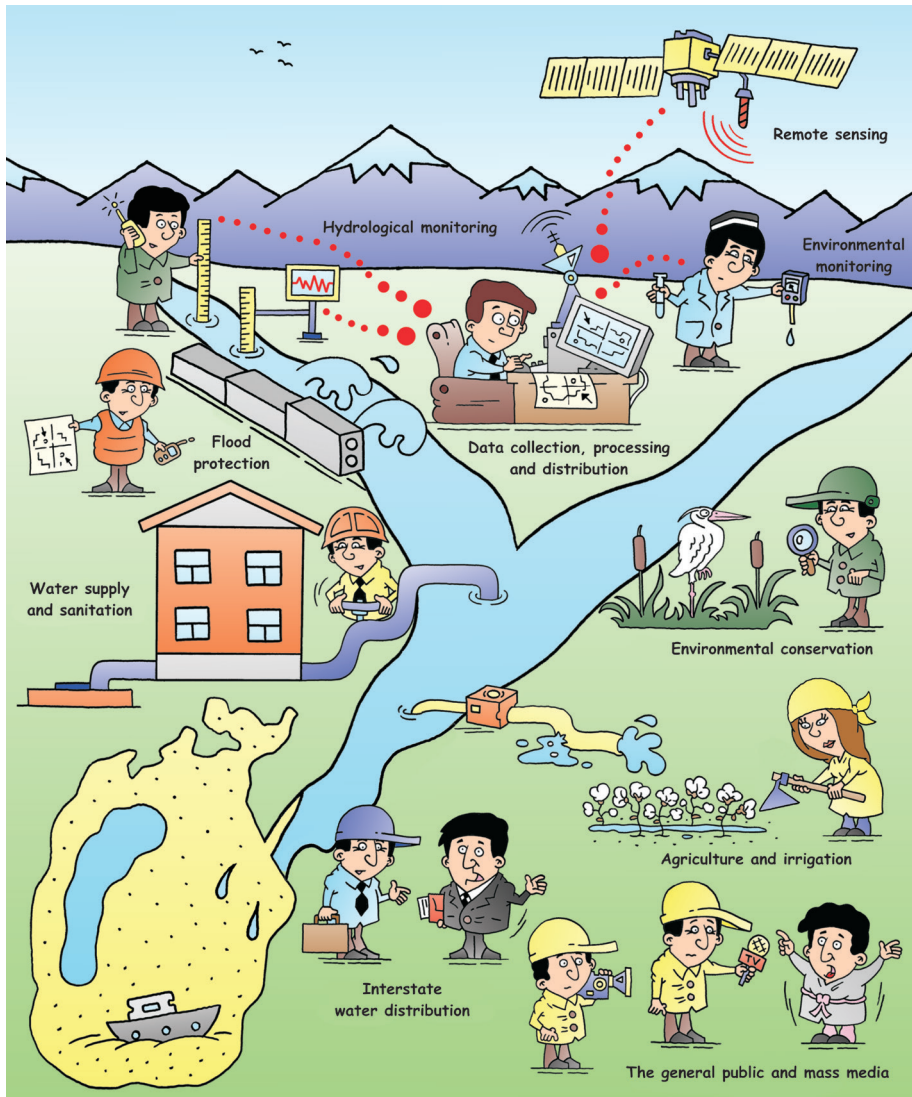
14. Final waste disposal: By type – recycling, composting, incineration with energy recovery, disposal at landfills and uncontrolled dumps



Environmental protection expenditures

The expenditures by enterprises and the state related to environmental protection: treatment and remediation of pollution, investments in environmental protection, maintenance of protected areas, protection of wildlife, forests, environmental education, and other environmental expenditures

INFORMATION FLOW: FROM DATA PRODUCERS TO DATA USERS (WATER RESOURCES EXAMPLE)



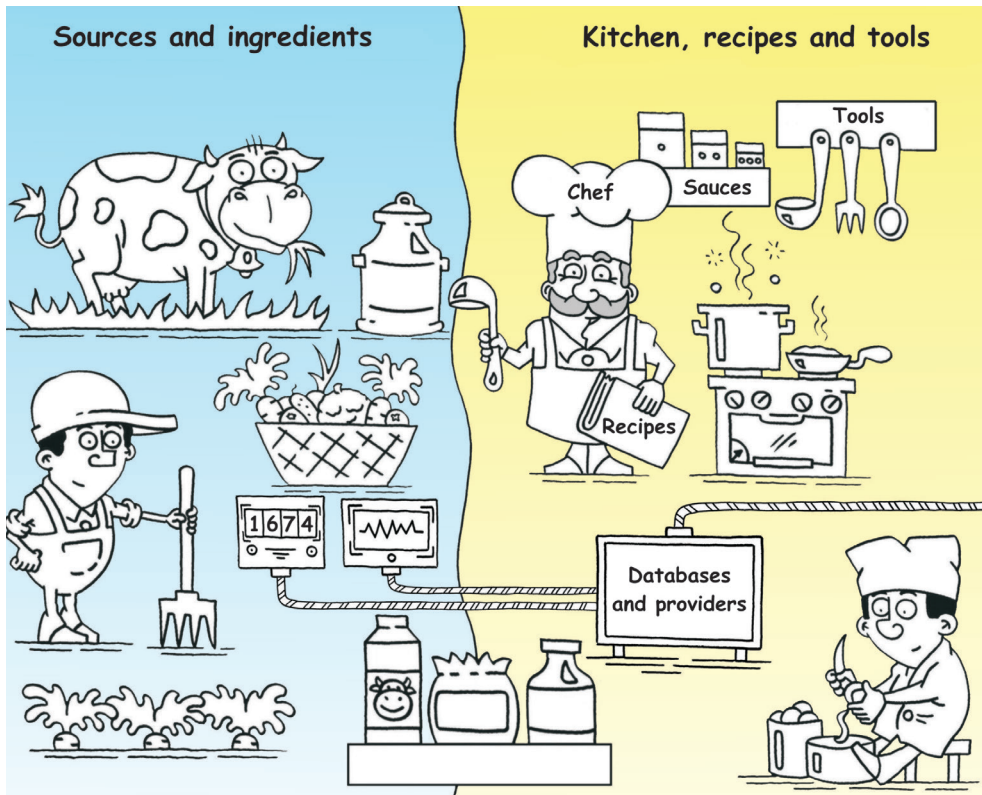
SOE KITCHEN: PRODUCTION ASSIGNMENTS

Describe the report's target groups and their expectations:

- Who are your readers and users?
- What are your products?
- What are the appropriate levels of sophistication in the language and supporting illustrations?

Produce a detailed list of activities and responsibilities for the production of the report:

- What are the roles and responsibilities?
- What skills are needed?
- What are methodologies, procedures and tools will be used?
- What indicators and data will be used?
- What maps and graphics are needed



Select partners and define any outsourcing needs for production tasks:

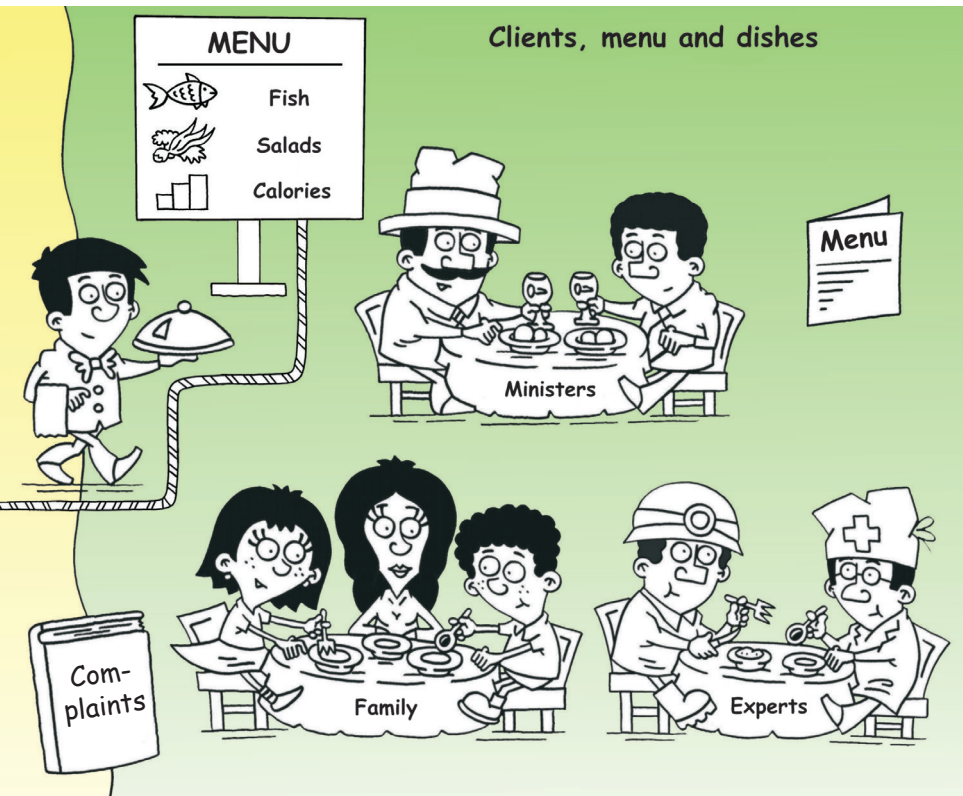
- What services and products might you need from outside your “kitchen”?
- What professional or technical skills do you want to add to your team?

Set up review procedures and quality controls:

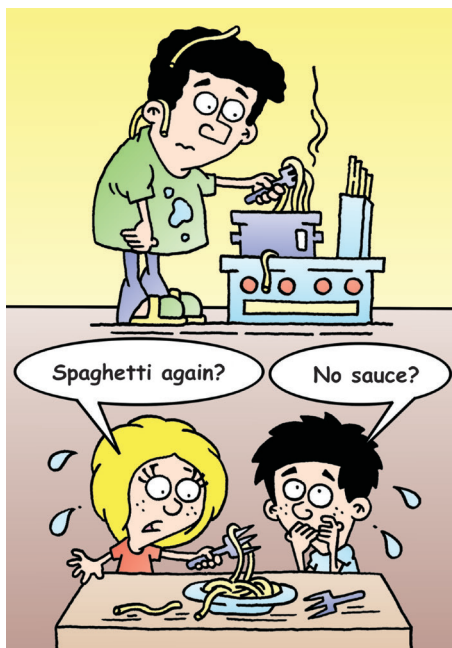
- Are your ingredients fresh and tasty?
- Who supervises quality control in your kitchen?

Find out how target groups are using the report, and hold consultations to improve the next version:

- Are your customers happy with the products from your kitchen?
- Do you track, compile, analyse and use customer complaints and feedback?



What to cook and how to serve: Content and structure



✔ Ensure that key environmental themes are easily identifiable and that the themes reflect local, national and global priorities and scales of coverage

✔ For each environmental theme, ensure that the chapter contains enough information on:

- The analysis of trends
- Progress towards targets
- Key messages and projections for decision-making or societal responses

✔ Develop more forward-looking assessments that ask what may happen in the future, and that explore possible responses



✔ Consider chapters that cover:

- Key economic sectors
- The various forces affecting environmental conditions and trends
- Community and institutional responses

✔ Highlight the main findings, and explain connections, important definitions and trends with informative headings and information boxes throughout the report

Making the presentation appealing



- ✔ Maintain a balance among text, visuals and tables
- ✔ Provide visuals in the context of specific themes
- ✔ Support indicators, visuals and tables with information and links to data sources
- ✔ Use understandable, easy-to-read language



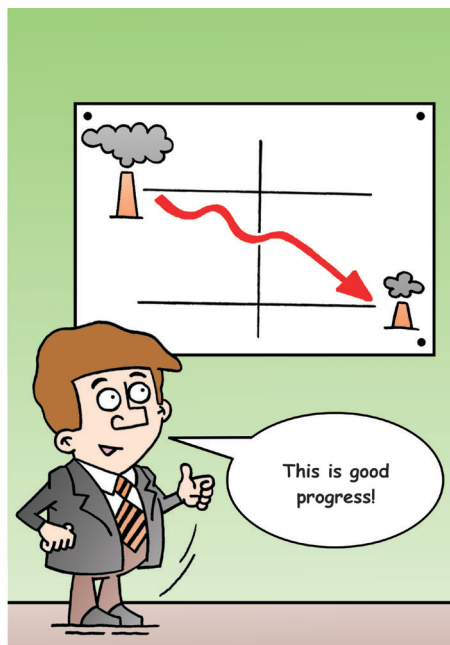
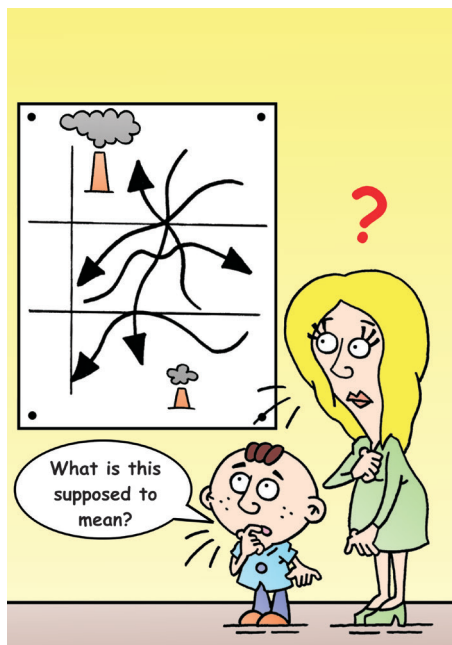
- ✔ Use locally designed cartoons and drawings to explain complex or sensitive issues that may be difficult to illustrate with conventional graphics, maps or schemes
- ✔ Prepare short versions and spin-off products such as videos and posters organized by user group or theme

Table settings: User friendliness and online convenience



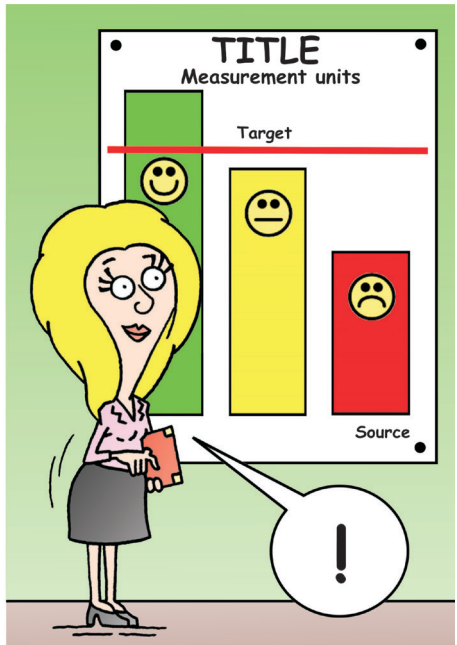
- ✔ Structure the information in several layers so that readers can take in the headlines and summaries of issues and then zoom in on details and features
- ✔ Use appealing yet simple web design allowing users to get the information they want with 2-3 mouse clicks
- ✔ Employ navigation that allows quick searches by environmental theme, indicator and visual, and find ways to “animate” spatial data and time series
- ✔ Limit the length of web pages and balance the contents to include visuals, multimedia and links to data sources, downloads and “Read more about ...”
- ✔ Ensure that the fonts in the visuals and the text are compatible and easy to read
- ✔ Avoid vertically oriented titles and elements to the extent possible

Cooking secrets: Clear interpretations and illustrations



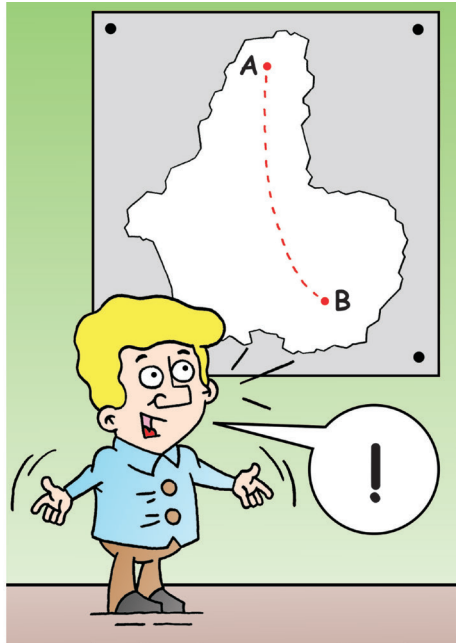
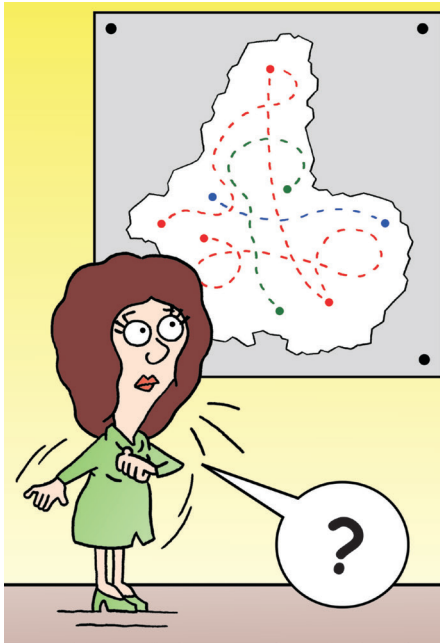
- ✔ Use professionals to interpret and annotate trends and to provide commentary
- ✔ Choose illustrations and multimedia materials to match the issues and the narrative
- ✔ Explain to the extent possible how the country reached specific targets – an economic slowdown, the application of new technology or policy or other development
- ✔ Select photos with good composition and resolution from professionals or from locally available sources
- ✔ Encourage users to adapt the report to their own specific purposes – to develop videos, posters or other creative applications
- ✔ Design visuals that give a clear message and can be understood without a caption

Sauces and condiments: Graphics and layout



- ✔ Create templates for consistency in graphic design and in the appearance of reports
- ✔ Use professional graphic designers for graphics and for layout of publications and online editions
- ✔ Carefully check computer-generated graphs to select the appropriate type of visuals:
 - Use pie charts for share comparison and bar charts for absolute numbers
 - Select colours that are intuitively clear – high temperatures in red/warm colours; low temperatures in blue/cold colours
- ✔ Make sure that each illustration contains a title, measurement units, a legend and the data source
- ✔ For indicators, use both the units of measurement commonly used in the country and the internationally recommended units

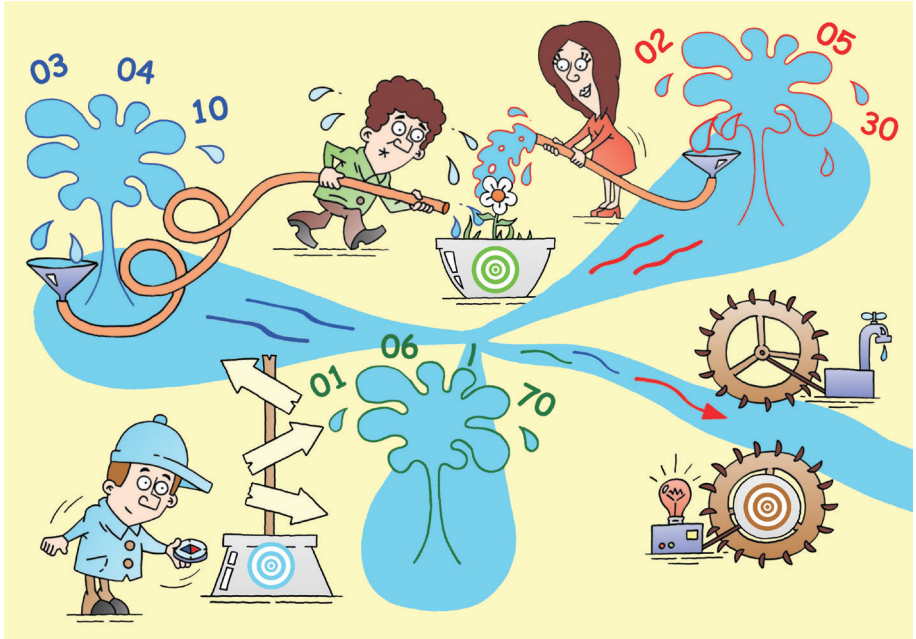
Dessert: Maps



- ✔ Limit maps to 4-5 easily distinguished elements or categories
- ✔ Use colour schemes and symbols that are balanced and intuitively match the theme or element displayed:
 - Wet and cold conditions in bluish cold colours; drought and heat in orange-to-yellow gradients
 - Biodiversity protection sites in green or with wildlife symbols; water issues in blue
- ✔ Ensure that GIS maps match the graphic style of the publication, include only basic geographic references and avoid overloading with computer-generated noise
- ✔ Use maps to present such spatial information as networks of protected areas, pollution hotspots, monitoring locations, emission loads and climate change patterns


Shared Environmental Information System principles – 1

Information should be:



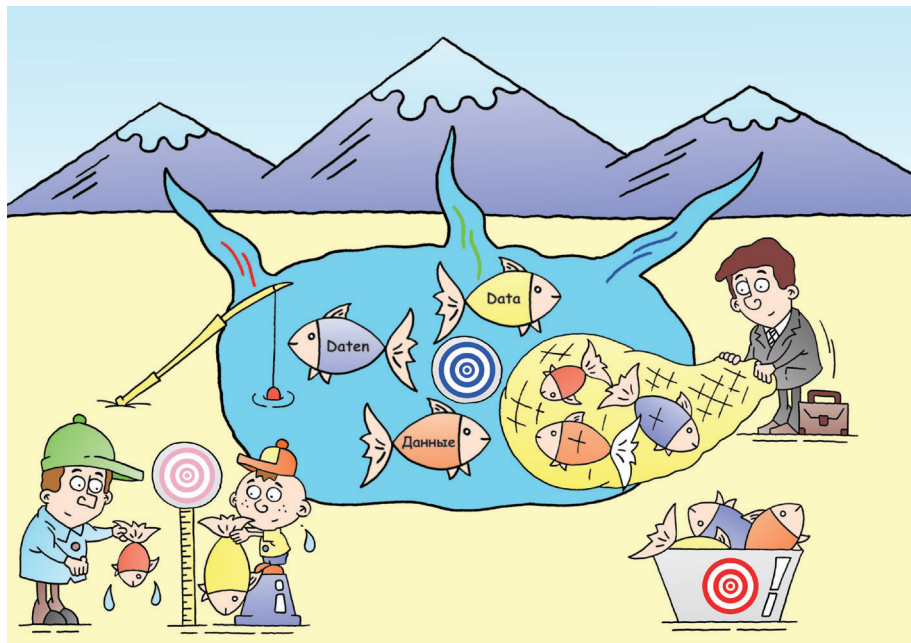
 Readily available to easily fulfil reporting obligations

 Managed as close as possible to its source

 Collected once, and shared with others for many purposes

Shared Environmental Information System principles – 2

Information should be:



Accessible to enable comparisons at the appropriate geographical scale, and citizen participation

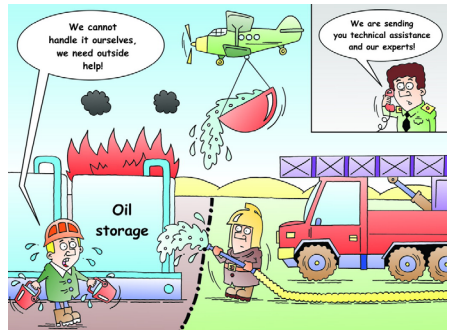
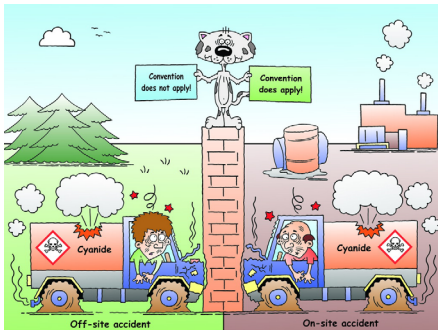
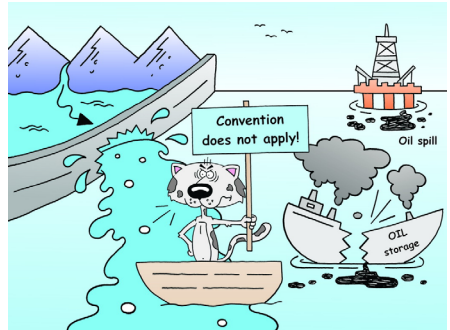
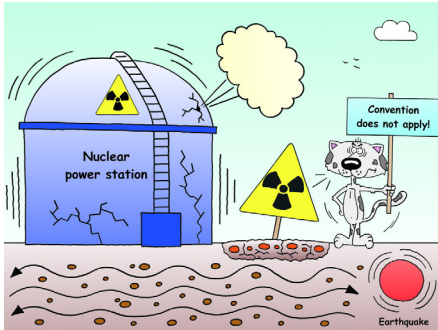


Fully available to the general public, and at the national level in the relevant national language(s)



Easily accessible to all users

Samples of cartoons to illustrate applications of the UNECE TEIA Convention



The Cookbook is designed for specialists working in organizations that produce environmental information, and is intended to help those preparing reports make their products more accessible, useful and of better quality. It is not a comprehensive guide to the development of state of the environment reports. Each reporting stage requires specific knowledge, familiarity with the application of environmental indicators and expertise in design and cartography.

The authors hope that the recipes will inspire ideas for practical applications, and will be grateful for any suggestions that will make their recipes simpler or clearer, and the finished dishes and reports tastier and more useful.

