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Approaches to Sustainability I

Environmental Auditing and Management

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6.1 Management approaches

(based on the manual for MEA, see p. 38-39)

Tools to help improve the environmental situation in human settlements have been developed in many different contexts. These include both *analytical tools* such as Environmental Impact Analysis EIA; Life Cycle Assessment LCA; Eco-Management and Audit Scheme EMAS; and the use of *indicators* to monitor environmental impacts of many kinds, for sustainability as well as health. In addition to these there are also more straightforward *management tools*, such as ISO 14000, to which some ecovillages try to adapt and, again, the audit schemes.

Together they are a part of the systematic, predictive and preventive environmental work, which received a push forward in the report of the Brundtland Commission and the Agenda 21 documents.

There is a wide variety of *audit schemes* currently in use. The Union of Baltic Cities, UBC, to which some 70 cities in the Baltic Sea region now belong, has recently worked out methods and principles for a municipal environmental audit (MEA). The UBC audit scheme is based on the work of the World Bank which in turn originates from the Eco-Management and Audit Scheme (EMAS) within the European Union.

The basic form of auditing, that is, compliance auditing, where performance is audited against legislation, regulation and codes of conduct, is typical for companies. In the UBC manual, the focus is on environmental management and the auditing is done against self-determined targets. But it may change as municipal environmental management systems are currently subject to international standardization (Anon, 1995). These standards were published in Finland and Estonia in spring 1997.

The audit is typically performed against: 1) legislation; 2) environmental effects of production processes; 3) management and administration activities; 4) environmental economy, investment related to environment, and planning and 5) communication of results to the public. In MEA, specifically, 'non-polluting' environmental performance such as regulation of environmental health and, for example, safety in transport and storage of hazardous material should also be given attention.

6.2 Improving health

The origin of the ecological movement was clearly connected to concern about health effects from environmental pollution. Although the agenda has widened considerably, the concern for health is still present. This is especially true for planning and habitation. The healthy cities programme of the World Health Organization, WHO, is perhaps the most systematic effort to improve the public health situation in cities in the world. Not only pollution but, in general, parameters that influence health in cities are studied in this programme. Health is not only the absence of disease but a positive concept: 'well-being'.

The World Health Organization (WHO) Healthy Cities Project (HCP) began in January 1986 with eleven cities initially participating. Since then, the project has developed into a major public health movement at the local level, involving networks of over 500 cities throughout Europe and another 300 cities in other

Figure 6.1 Traffic and urban transport are important parts of municipal environmental auditing. Better opportunities to use bikes, as here at the youth theatre at Ekeby in Uppsala, is one way to reduce the environmental impact of traffic.

Municipal Environmental Audit (MEA)

A manual for MEA in Baltic cities has been published by the Commission for the Environment of the Union of Baltic Cities, UBC. The manual was tested in a MEA process in Tallinn during 1996/97 under the guidance of the city of Turku/Åbo. Training workshops are being held for participants from UBC cities in Latvia, Lithuania, Russia and Poland. The MEA project in Tallinn is a demonstration project as it is the first extensive MEA conducted in the Baltic area. The text below is based on the manual.

WHY MUNICIPAL ENVIRONMENTAL AUDIT?

In the audit, answers are given to questions specific to a city, such as: How is the city affecting the environment? How healthy is its environment? What are the environmental monitoring parameters/indicators and what do they tell us? In other words, we are asking: Is the city performing in an environmentally sound way, and do we get the right answers to environmental questions? This question is usually answered by 'state of the environment reports', which most cities produce regularly. UBC is willing to go one step ahead in this by asking questions about the environmental performance of the city. After performing the MEA, a city should realize its weak points in environmental performance and be able to point out the relevant things to change in order to improve the quality of its environment.

STEPS OF THE AUDIT

Auditing is usually visualised as progressing stepwise.

Step one: Preparatory work. Introducing the audit methods and principles to city officials is crucial in order to achieve the commitment and to secure the final success of the audit. Being audited may be threatening and the auditors should make every effort to achieve a positive approach and commitment. Desirable characteristics for the audit team member are a thorough knowledge of municipal environmental issues and, as far as possible, independence from the management system.

Step two: Collecting the data. After the field missions are completed, each auditor should prepare a preliminary list of findings and make sure that he or she has put the right questions to the right persons.

Step three: Analysis of data. The data should be collected in a way that will demonstrate the strengths and weaknesses of the management procedures. Reliability of environmental monitoring systems should be addressed. For example, control values, such as maximum permissible concentrations (MPCs), should be used and time-series changes variation analyzed and shown. Some kind of cost/benefit analysis should be possible after the MEA.

Step four: Reporting, recommendations and dissemination of auditing. The audit report has three basic purposes: 1) to provide management information; 2) to initiate corrective action and 3) to provide documentation of the audit and its findings. The report should include hints on technical solutions. All the findings, suggestions and conclusions from the audit must be mediated to both the governing bodies, management as well as to the public.

Step five: Follow-up and the audit cycle. The nature of auditing is repetitive, which means that unfavourable findings are followed in the subsequent audits until they are eliminated. If the reporting is properly done, it should initiate corrective actions.

INITIAL ENVIRONMENTAL REVIEW

An environmental review report is to have the following parts: 1) current state of the environment and its monitoring; 2) listing of the most important factors stressing the environment; 3) evaluation of the situation and recommendations for future activities. The following is intended as a rough guideline showing only which activities and sectors at least should be considered in MEA.

Water quality, consumption, protection and emissions to water. Water protection legislation; map and categorize industrial water pollution to sources (different type of industry) and volumes; Connections of industry to municipal water purification systems; Diffuse water pollution, riverine water pollution the use of fertilizers in agriculture, and aquaculture.

Air quality, pollution and emissions. Air pollution and emissions of major pollutants from various sources (for example, traffic, industry, power plants and heating centres, private heating, waste incineration, etc.); critical issues involved in abating air pollution; raw material for production energy production; nature of emissions and the role of district heating; the role of traffic in emissions of NO_x and other components of exhaust gases.

Contamination of soils. Typical suspected places are abandoned military areas and garages and gasoline stations. Responsibilities concerning mapping and treatment of contaminated soils should be described.

Solid wastes. Sources of household and commercial municipal solid waste, hospital waste, industrial waste, hazardous waste (oil, used batteries) and radioactive waste; waste generation, waste management (minimization, recycling, composting, collection, transfer, treatment and disposal), expenditure involved in waste management and policy, and regulation implementation and enforce-

ment. Also forestry, mining, use of sand, gravel and stones are to be considered when causing waste build-up.

Noise. Legislation, decisions and recommendations; sources of largest noise and smell and the population subject to them.

Natural, nature protection and green areas. Nature protection and green areas belong to the state of the environment review, but as activities they also belong in the environmental performance, that is, actions that are taken in order to improve the quality of the living environment.

THE ENVIRONMENTAL PERFORMANCE

Institutions and management. The auditors should have clear minds about which bodies comprise the municipality and how they are set up. For example, in Tallinn the City Council is a representative body elected by voters among the city inhabitants and the City Government is the executive body formed by the City Council and additionally the city is divided into eight City Districts.

Environmental programmes. For example, in Tallinn the environmental programme is called: "The Environmental Concept of the General Plan of the City of Tallinn". In this concept, environmental protection is one of the priorities of the development, at the same level of importance as the economy. The environmental concept is closely linked with the economy, construction (including architecture and planning), municipal services and transport concepts.

City service effects by boards and departments. Usually the cities provide the inhabitants with a variety of services: for example, cultural, social and environmental issues are taken care of by their own boards as well as energy, construction and communications activities having their respective departments.

Water distribution network and related activities should be analyzed when they have significant environmental effects. Information should be gathered on all issues concerning present and future water resources such as water supply, sewage, sanitation services, industrial effluent and pollution control, concentration of pollutants, water quality monitoring and evaluation of its coverage as well as publishing and making available to the public reports on water pollution policy.

Land use and its planning should be analyzed when they have significant environmental effects, as well as the protection of the cultural and natural environment, historical buildings, monuments and archaeological sites.

Energy production and network should be analyzed when they produce significant environmental effects through the services of the operational unit producing the service. A description of energy production and consumption is needed, including heating systems, industry and traffic (diesel and gasoline consumption of cars). Total yearly energy consumption (kWh) should be estimated and a breakdown should be done to show the proportions consumed by heating, cooling and electricity in small houses and industry; types of energy, such as oil, gas, district heating, gasoline, diesel, ethanol (in transport) and renewable energy should be indicated.

Traffic is a topic which should be given attention in several places; it is connected at least to air quality, energy consumption, noise, city planning, environmental health and contamination of soils.

Green areas, nature and biodiversity protection. The effects of local urban development, tourism, industrial development and agriculture on green and nature protection areas should be included. Biodiversity should be given special attention as an emerging concept of international nature protection activity.

Environmental health issues. Human health issues, such as occupational health, noise and quality of drinking water and food may belong to health care organizations and not to the environmental office and therefore they are usually not included in traditional 'state of the environment' reports. They should be part of an audit however.

Environmental budgeting and savings. An important means of understanding the importance of environmental issues in the city is the analysis of environmental expenditure in the government and city budgets and financial systems.

Environmental awareness. Municipal purchasing, general regulations and recommendations in, for example, the traffic department are an important aspect and should be given special attention. Other planning as well as production development should also be infused with life-cycle and sustainability attitudes. It may concern new processing techniques, placing of new plants or buildings and choice of transportation. It should also concern, for example, the buying of new interiors in offices and magazines, new equipment such as computers, copiers, heaters and ventilation as well as paper and light bulbs. Questions to be asked from citizens are: Is the environmental decision-making made public and do citizens have access to it? What kind of environmental training, education, guidance and information have they received?

(Manual for Municipal Environmental Auditing (MEA) in the Baltic Cities by Ilppo Vuorinen, Mikko Jokinen and Olli Madekivi, UBC Commission on the Environment, Linnankatu 61, 20100 Turku, Finland; fax +358-2-230 3518; E-mail mikko.jokinen@turku.elisa.fi)

parts of the world. A number of project cities, such as Copenhagen and Glasgow have already produced excellent examples of comprehensive city health plans and the 1995 'Healthy and Ecological Cities' Conference in Madrid produced a constellation of reports on local initiatives – from insulating tower blocks in Sheffield to restoring a deprived area of Barcelona, from transforming Krakow's environment to working towards 'child-friendly' cities in Italy.

One project has been to develop a set of health indicators (See box). The aim of collecting such data is to facilitate policy-making and priority-setting in relation to health, development of city health profiles and city health plans.

6.3 Social and economic aspects

Sustainable development of habitations has three clearly different dimensions: 1) environmental health and use of natural resources; 2) economic life and 3) social life. Each of them has negative and positive aspects. Examples of negative parameters are, for example, pollution of air, use of fossil fuel, poverty and crime rate. Positive examples are clean water, high employment and functioning child care.

Each of these many parameters has been developed into sustainability indicators to be used by cities in their efforts to improve the management of their cities. The challenge of the indicators is to reduce the more than a hundred, different indicators into a few that will be good measures of the state of the city. Developments to achieve such combined indicators are going on.

Aspects that are not so easily measured by indicators, but that still are crucial are the democratic and participatory character of sustainability. It is also interesting to see that cities that have started the task of approaching sustainability may change their economy by, for example, the ordering of products, so as to stimulate and favour their own community. It reminds us that sustainability has not only a technical aspect but also a ethical one; perhaps this is close to solidarity.

Internet addresses

In the era of information society internet has become a powerful source of text, voice, pictures, and movies. It is very possible that in the future more and more interaction between people will be via internet. This also means that those people who have no access to internet will stay as 'silent voices' and some of those who have the access will become a certain kind of gatekeepers of electronic information. In any case below there are examples of internet addresses (world wide web sites) which are in a way or another concerning sustainability or sustainable urban development.

http://www.fa.stuba.sk/kat/keevt/sudvl.html The World Wide Web Virtual Library. Resources containing lists of www sites and other sources relevant to sustainable urban development.

http://www.tidepool.com/alliance/aft9.html Electronic newspaper 'Auto Free Time Issue' - two examples of articles of issue 9: Ecological Cities "Yes"; Electric Cars "No" (by Richard Register) Traffic Calming: Taming the Traffic Beast (by Tom Samuels).

http://solstice.crest.org/ The site for energy efficiency, renewable energy, and sustainable technology, information and connections. Three main menues are available: energy efficiency, renewable energy and sustainable living (environment, green products and practices, planning, case studies).

http://solstice.crest.org/sustainable/index.html The category of 'environment' includes environmental impacts of building materials, recyclable materials, composting, solid waste etc; and 'planning' includes integrated transportation planning in Curitiba; case studies are mainly concerning the renewal projects in different communities and cities of the United States.

http://www.gaia.org/ Eco-village information service. An eco-village is a human scale, full-featured settlement which integrates human activities harmlessly into the natural environment, supports healthy human development, and can be continued into the indefinite future. This site offers an eco-village directory (like The Farm, USA; Lebensgarten, Germany; Ladakh, India; Findhorn, Scotland; 20 communites, from Russia to Argentina), eco-village resources (like Links to eco-villages around the world; Electronic resources; Eco-village classified ads), and events calendar (like Conferences, workshops, sorted into relevant categories).

http://www.sustainable.doe.gov/ The home site of Center of Excellence for Sustainable Development (a project of the US Department of Energy's Office of Energy Efficiency and Renewable Energy). Plenty of information and links concerning the projects of sustainable use of energy.

http://kaos.erin.gov.au/portfolio/esd/nsesd/Agenda21.html This is a hypertext index to Agenda 21, providing links to the full text of each chapter.

http://iisd1.iisd.ca/ic/info/ss9504.html This site is presenting a large list of books which are concerning sustainable development indicators: Sustainable development indicators measure sustainability or sustainable development performance. As most environmental indicators have a sustainable development framework in which environmental, economic and social indicators are linked they have been included.

http://www.eastend.com.au/~ecology/index.shtml The Adelaine EcoCity Site. This site is home to: The Halifax EcoCity Project: the first detailed design for an Ecopolis in Australia, in the centre of the city of Adelaide, where ECOPOLIS = Ecologically Responsible and Sustainable Urban Settlement. Site offers link to Halifax Project (How the Ecopolis Development Principles are realised in a community development) and links to other Future-Responsible sites.

http://www.cedar.univie.ac.at/data/habitat The site of Habitat II conference (The Second United Nations Conference on Human Settlements), which was held from June 3 - 14, 1996 in Istanbul, Turkey. The Structure of the Habitat II database includes 12 topics (links).

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