

## Chapter IV: Structural and Process Indicators of Environmental Health

### A. General Considerations

Human rights indicators may be categorized in several ways. The approach proposed by Paul Hunt, the UN Special Rapporteur of the Commission on Human Rights on the right of everyone to enjoy the highest attainable standard of physical and mental health, while specifically directed to indicators for the right to health, is relevant to other economic, social and cultural rights.<sup>5</sup> Hunt distinguishes between three types of indicators: structural indicators, process indicators, and outcome indicators:

- *Structural indicators* address whether or not appropriate infrastructures are in place that are considered necessary for, or conducive to, the realization of a specific human right. Specifically, structural indicators evaluate whether a country has established the proper institutional framework and adopted public policies and constitutional provisions, and whether it has enacted relevant legislation and regulatory standards that are required to implement those rights. Most structural indicators are qualitative in nature and therefore are not based on the acquisition of detailed statistical data; thus, a number of structural indicators may be evaluated by a simple yes or no answer. However, in many instances such a simple evaluation may not be appropriate for deciding whether to conduct an environmental health monitoring project. In such cases, a more thorough capacity assessment of a region's environmental laws and regulatory infrastructure should be evaluated before commencing a monitoring project
- *Process indicators* assess the degree to which activities that are necessary to attain specific rights-related objectives are being implemented and the progress of these activities over time. The types and amounts of governmental input are one important kind of process indicator. Process indicators are variable and require statistical data.
- *Outcome indicators* assess the status of the population's enjoyment of a right. They show the "facts" and measure the results achieved. Many of the Millennium Development Goal indicators are outcome indicators. Like process indicators, outcome indicators are variable and require statistical data.

### B. Structural and Process Indicators: Pre-Project Screen

Before commencing a field-level project with the help of this guidance manual, community-based groups and human rights organizations should undertake a preliminary assessment of the national, regional and/or local government's capacity to carry out legislative directives and monitor regulatory laws and standards. We recommend that a survey of legislative and regulatory laws in the field of environmental protection and public health be carried out, including developing an inventory of resources, personnel and administrative infrastructures that are available to implement and monitor regulatory guidelines and standards. For instance, a pre-project screening questionnaire should be developed, in which information should be obtained on a set of structural indicators (as outlined below) that assists in evaluating the current ability of government agencies to implement and/or collect monitoring data on environmental health indicators and benchmarks as presented in this manual.

Structural and process indicators on environmental health may be divided into the following categories of constitutional mandates, legislative and regulatory laws, and administrative and infrastructure capabilities:

**1. Is there a Constitutional Mandate?**—To assess whether there are provisions in the national constitution of a country that sets forth goals and rights of individuals and communities to a safe, clean and healthy environment.

For instance, the Indian Constitution, which was adopted in 1949, sets forth two overarching principles: (a) fundamental rights and (b) fundamental duties. Under fundamental rights, the Indian Constitution provides the "right to constitutional remedies", which allows matters of highest public concern to be brought directly to India's Supreme Court, and under fundamental duties, the Constitution requires specific obligation to "protect and improve the natural environment."<sup>6</sup>

<sup>5</sup> Paul Hunt, *Interim report of the Special Rapporteur of the Commission on Human Rights on the right of everyone to enjoy the highest attainable standard of physical and mental health*, United Nations General Assembly, Fifty-eighth session, Agenda item 117 (c), 10 October 2003, United Nations General Assembly, paragraphs 14-29.

<sup>6</sup> Indian Constitution website: [http://www.legalserviceindia.com/constitution/const\\_india1.htm](http://www.legalserviceindia.com/constitution/const_india1.htm)

Similarly, the South African Constitution, which was adopted in 1996, provides each citizen of the country the right to a clean and healthy environment. Under Section 24 of the Constitution, it states:<sup>7</sup>

Everyone has the right: (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—(i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

In addition, under Section 27 of the South African Constitution, every citizen has a right to “health care services” and “sufficient food and water”; and, further, “. . . the state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realization of each of these rights.”

In general, structural indicators on constitutional mandates should assess provisions to:

- (1) Protect individuals and communities from harmful agents in the environment;
- (2) Provide a clean, safe and healthy environment—air, water and land;
- (3) Allow redress of grievances when harm occurs.

**2. Is there Sufficient Legislative Authority?**—To assess whether legislative laws and statutory authority by national, state (provincial) and local (county, municipal) governments have been enacted to protect the natural environment and safeguard human health.

In general, structural indicators on legislative authority should determine whether statutory authority has been conferred on administrative and regulatory agencies to carry out programs on protecting human communities from adverse impacts of a degraded environment and harmful products in the following areas:

- **Clean Air legislation**—with legally enforceable provisions on (i) widespread, common air pollutants, (ii) highly hazardous substances, (iii) long-range and transboundary pollutants, (iv) indoor air pollutants, (v) control of air emissions from industries and motor vehicles
- **Clean Water legislation**—with legally enforceable provisions on (i) safe drinking water, (ii) restoration of recreational water uses, (iii) microbial and toxic substances, (iv) program to curtail water effluent discharges
- **Toxic Substances and Hazardous Wastes**—with legally enforceable provisions on (i) priority list of toxic substances, (ii) health-based environmental standards and guidelines, (iii) clean-up of spills and hazardous wastes, (iv) control on imports and exports of harmful substances and products, (v) toxicity testing of old and new chemicals, (vi) risk assessment and risk management
- **Agricultural Chemicals and Pesticides**—with legally enforceable provisions on (i) safety evaluation and registration of toxic agricultural products and pesticides, (ii) guidelines on consumption and use, (iii) storage and disposal of agricultural products and pesticides

**3. Are there Adequate Administrative Infrastructure and Regulatory Capacity?**—Here determination of whether government agencies at the national, regional or local level have necessary financial and human resources, technical expertise and monitoring facilities, and public education and community outreach programs to fulfill their regulatory duties and responsibilities as delegated to them by legislative assemblies as legally binding statutory authority. Structural indicators on the administrative and regulatory responsibilities and duties should examine the infrastructure and capacities of government agencies as follows:

- **Budget Appropriations of Regulatory Agencies**—which should include review of (i) annual allocation of funds to implement regulatory programs on environmental health, (ii) salary structure of administrative and technical staff, (iii) funds allocated for monitoring and surveillance programs, (iv) funds for education and training of agency personnel, (v) funds for public participation and community outreach.
- **Human Resources of Regulatory Agencies**—which should include review of a number of personnel involved in regulating environmental health programs: (i) assignment of administrative and support staff, (ii) full- or part-time agency scientists, engineers and other technical professionals, (iii) retention of outside consultants, specialists and academic experts, (iv) composition and size of advisory bodies and technical review panels.

<sup>7</sup> South African Constitution website:  
<http://thor.sabinet.co.za/netlawpdf/netlaw/CONSTITUTION%20OF%20THE%20REPUBLIC%20OF%20SOUTH%20AFRICA%20ACT.htm>

- Level of Scientific and Technical Expertise—which includes a review of (i) level of education and training of in-house scientific and technical staff, (ii) mid-career training opportunities and educational sabbaticals, (iii) production of technical reports, manuals and journal articles, (iv) assistance from outside experts and advisory bodies.
- Monitoring Facilities, Field Stations and Laboratories—which includes a detailed examination of an agency’s implementation program with respect to: (i) establishment of monitoring and surveillance network at the national, regional or local level, (ii) numbers and types of monitoring units and field stations, (iii) adequate scientific laboratories and equipment, (iv) cooperative monitoring programs with academic institutions and research organizations.
- Public Education and Outreach Programs—which include a review of an agency’s involvement in establishing: (i) public education and information programs on environmental health issues, (ii) inclusion of public members on advisory committees and local review boards, (iii) funds allocated for community outreach program, such as public meetings, educational seminars, grants to grass-root organizations, etc

**4. Additional Information:** Although environmental health structural indicators primarily examine the legal authority, administrative infrastructure and overall capacity of government agencies to carry out their responsibilities and duties, they should be placed within the larger context of other public policy and good governance indicators, such as:

- Legal and Regulatory Implementation Indicators

For more information, see website of the International Network on Environmental Compliance and Enforcement: <http://www.inece.org/>

- Good Governance and Public Participation Indicators

For more information on this critical set of public policy indicators, see website of the World Resources Institute: <http://www.wri.org>

## **C. Ability to Carry Out Monitoring Program: Practical Considerations**

In reviewing information obtained in the pre-screening questionnaire on structural and process- related indicators, several practical factors should be kept in mind in order to assess the ability of community-based organizations in a region to conduct an environmental health monitoring project with the use of this guidance manual:

- (1) Accessing data on Primary Indicators or Benchmarks—To assess whether the manual’s recommended environmental health primary indicator and benchmark data are accessible from existing governmental and non-governmental monitoring sources. These include regulatory bodies, public health agencies, hospitals, clinics, agricultural extension services and other academic and medical institutions, which collect, analyze, process and store environmental and public health data at the local, regional or national level. Such data should include environmental exposure data on ambient concentrations of air and water pollutants, microbial contaminant levels in drinking water, acute and chronic disease incidence and prevalence data, and information on malnutrition, food safety factors and agricultural chemical use.
- (2) Obtaining relevant information for developing Secondary Indicators and Benchmarks—To assess whether relevant background information required to construct surrogate secondary indicators and benchmarks are available from government regulatory agencies, academic or research institutions, and private sector business or manufacturing industries. For instance, in order to determine the risk of childhood lead poisoning from exposure to motor vehicles emissions in urban regions, it is necessary to obtain data on the percentage of sales of leaded gasoline in a region, which are derived principally from regulatory agencies and/or oil refineries and commercial retail outlets. As recommended in the guidance manual, market sales and distribution information of leaded gasoline provides critical information in developing surrogate (or indirect) indicators or benchmarks for monitoring childhood lead poisoning at the local or national level.
- (3) Assessing internal capacity for planning and implementing monitoring program—Before undertaking the planning phase of the self-conducted monitoring program, community-based organizations should assess their internal capacities—both legal and scientific—to carry out the tasks of the program. In some instances, a working partnership may be necessary between local, regional or national organizations with complementary levels of expertise, such as having staff members (or outside consultants) who are well-

versed in legal, regulatory, scientific or engineering fields of knowledge. The ability of entering into such symbiotic partnerships may be an important consideration before planning and implementing the monitoring program.

- (4) Obtaining adequate funds and technical resources for conducting long-term monitoring program—A crucial factor in carrying out a self-conducted monitoring program is to assess whether adequate funds and technical resources are available over the long term, i.e., over a 3 to 5 year period. In order to assess changes in environmental health trends in a region, a monitoring program should not be carried out over a short (one to two year) time frame, since monitoring data collected over such a time period provides only a brief snapshot of overall progress or lack of progress in the health status of a community. However, if long-term funds cannot be initially assured or guaranteed it is best to commence the project with the understanding that such financial and technical resources may reasonably become available in the future.
- (5) Developing a quality control and quality assurance system in the monitoring program—A necessary and crucial factor in developing the monitoring program is to delineate a well thought out quality control and quality assurance system. Such a system would include such features as the proper tagging and handling of environmental sample, identifying its chain of custody, placing it in proper storage, etc. Similarly, good laboratory practices for analyzing environmental samples, based on national or international guidelines, should be adhered to in all circumstances. If the data on environmental indicators and benchmarks are primarily obtained from government agencies, it may be necessary to ascertain whether the monitoring body itself followed a well- established quality control and quality assurance program.