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SOCIAL INDICATORS AND ENVIRONMENTAL DIMENSIONS

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SOCIAL INDICATORS AND ENVIRONMENTAL DIMENSIONS

A SURVEY OF WORK ON SOCIAL INDICATORS DEVELOPED UNDER THE UNITED NATIONS WORK PROGRAMME

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PREFACE

This report is a survey of work on social indicators developed under the United Nations Work Programme aiming at determining environmental dimensions on social indicators. The demand for both social and environmental indicators have been recognized, and the inter-relationship between the man-made and the social environment is discussed in terms of the role of sociology in environmental concerns.

The report is a reprint of a paper presented to the Statistical Commission and Economic Commission for Europe in march 1983.

Central Bureau of Statistics, Oslo, april 1984

Arne Øien

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1. INTRODUCTION

The aim of the study has been to determine environmental dimensions of social indicators included in previous work under the Programme of the United Nations (UN) Statistical Commission.

The approach has been to look at the need for social indicators and the interrelationship between social and environmental indicators and producing a check-list as to environmental dimensions of social indicators.

A preliminary list of social indicators with environmental dimensions is thus presented in table 2, and table 3 presents social concerns of environmental indicators. Based on the evaluation of the two tables, table 4 presents environmental dimensions of environmental elements derived from a complete human ecosystem. Potential concerns are discussed in terms of environmental dimensions needing focusing, and special attention has been given to the example of noise.

The basis for the check-list produced in the tables 2, 3 and 4 have been derived from previous work under the UN Programme and a preliminary list of environmental indicators produced under the ECE Task Force on the Study of Environmental Indicators[1)].

2. THE NEED FOR INDICATORS

The objective of developing indicators is to provide quantitative expressions of information on interacting elements and issues of common interest within a system. The adaption and use of indicators thus will enable a comparison of elements in the system within time and space, and indeed in practise will provide a common format so as to harmonize definitions, methods of measurement and evaluation criteria as far as possible. The selection of indicators is, however, largely dependant on the actual costs involved in data collection.

2.1 Environmental indicators

The need for environmental indicators has been defined as (1) - "a system of environmental statistics should clearly reflect interactions between its elements and should make it possible to trace the influence of changes in one field of the system exerted on the other sub-systems".

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1) The Task Force was set up by the Senior Advisers to ECE Governments on Environmental Problems - to study questions of environmental indicators.

The Task Force on the Study of Environmental Indicators roughly grouped the environmental indicators as follows:

(i) State of the environment

(ii) Interaction between the environment and social, economic and cultural environment

(iii) Instruments of environmental policy.

2.2 The need for social indicators within a framework of environmental statistics

When developing environmental indicators attention has been/ should be paid to building links to and the inter-relationship with social indicators.

The UN Framework for environmental statistics[1] has a two-dimensional structure which relates the sequence of human interference with the environment to a breakdown of the environmental field. The framework reflecting one of the conclusions arrived at a by national and international organizations when reviewing environmental statistics, stating: "natural phenomena, human activities and living conditions, their impact on the environment and effects on human welfare, as well as private and public/policy/responses to these impacts need to be covered".

The structure of the UN Framework for environmental statistics was roughly grouped as follows:

(i) Natural environment

(ii) Man-made environment - human settlements

(iii) Ecosystems

3. THE INTERRELATIONSHIP BETWEEN THE NATURAL AND THE SOCIAL ENVIRONMENT

3.1 The role of sociology in environmental concerns

Environmental concerns have - so far - mainly been focused on aspects of technology and biology. Important environmental problems within society as well lie in the inter-relationship between the two aspects caused by the so-called technical economical development as opposed to the natural environment itself. Practical environmental concerns thus have been the question of water and air quality, the protection of flora and wildlife and to prevent consumption of agricultural land and of non-renewable resources.

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1) Draft document 0107 A, Statistical office of the UN Environment Statistics Section, June 1982 (2).

However, implicit in most scientific theories, there will exist human concerns and theories concerning man and his wellbeing. Such theories are rarely explicitly apparent, although they might be developed in ways of social reasoning, evaluation and final decision-making.

Accordingly, implicit in natural resource planning and policies is a philosophy concerning the human being thus implying environmental concerns being justified by:

(i) Environmental concerns being important to the human wellbeing,

(ii) The responsibility for "nature" being justified by nature's values on their own.

Environmental concerns have in a way been dominated by man being defined as a biological phenomena, which implies that life quality has been defined within a human biological ecosystem. Problem areas of environmental concerns thus imply chemical, physical and biological pressures, and the question of for instance dust, gas, noise, smell, toxic emissions and man-made impacts on the environment. Furthermore the important issue will be measuring pollution levels, regulations and obtaining technical-economical solutions to the problems.

The role of sociology in such environmental concerns will constitute an important dimension to the issue, in fact as man as a human being and not only biologically defined. To ensure a biologically safe environment for man to live in will thus be necessary, although not enough as an environmental concern on its own. The human wellbeing will as well be dependant on needs more directly connected to the fulfillment of happiness, social comfort and personal well-being.

The introduction of sociology in environmental policies and concerns is based on a realization of the environment being basic as to how people live. The point of human ecosystems is that there is a mutual interaction between society and the environment which enables society to exist. The environment comprises the resource base of many of society's most basic activities, and people manipulate and mold it in an effort to meet their needs.

3.2 Dimensions of a human ecosystem

A human ecosystem can be divided into three main interacting parts:

(i) The environmental

(ii) The individual-management

(iii) The policy-making

In shorthand one usually refer to the first part as "the environment" and the other two collectively as "society". Important characteristics of such interacting parts can be summarized in table 1.

T A B L E 1 CHARACTERISTICS OF INTERACTING PARTS IN A HUMAN ECOSYSTEM

	Environmental	Individual-Management	Policy-Making
Representative Actors,	Animals Plants	Farmers Fishermen	Government International organizations
Phenomena	Soil Water	Industries Nature organizations	
Characteristics	Phenomena obey laws of natural ecosystems	Decisions directed internally, to affect own actions	Decisions directed externally, to affect actions of others
Representative Actions	Individual growth Interactions among populations Soil formation Atmospheric, water chemistry Noise, waste generation	Land use decisions Capital formation Marketing decisions Management of animal and plant populations	Taxation and subsidies Coordination of different sectors of society Regulations Education, policy
Disciplines: Background of Practitioners	Ecology Applied physics and chemistry Engineering	Microeconomics Engineering Business	Macroeconomics Business Law Policy sciences

Source: "Human ecosystems", W.B. Clapham, Jr.

The environmental part will comprise those system components that react according to the laws of natural ecosystems. Here are the geobiological phenomena of plant and animal growth, population and community dynamics, and the flow of nutrients and energy.

The individual-management part comprises the behaviour of those people and institutions who interact directly with the environment and manipulate it deliberately or unintentionally. The policy-making part comprises the mechanism by which society generates economic and policy signals.

The division in table 1 points out the different kinds of actors that have a role in molding the human environment. Each part is accordingly characterized by one or more relatively well-defined sets of phenomena, as well as a set of disciplinary approaches, and these views can be intergrated into some sort of meaningful overview.

There is a mutual interaction with feedback from the environment to society. The behaviour of the environment affects the behaviour of the manager, and vice versa. Policies influence management, and vice versa. Indeed, environmental problems can lead to change in policies, and government can ultimately influence environmental health and stability. The domains constitute a system whose parts can usefully be looked at separately and indeed have been separated, but the system is not meaningful until its different parts are viewed together.

Conclusively, a human ecosystem can be treated as a geographic and social overlay for a framework for environmental elements.

4. THE INTERRELATIONSHIP BETWEEN SOCIAL AND ENVIRONMENTAL ELEMENTS

Table 1 showed the complexity and multiple dimensions of a human ecosystem, which can be portrayed as an ordered set of processes connected by a network of flowing information. The management of various facets of the environment will for instance monitor particular geobiological phenomena in return, indeed also responding to economic and policy signals generated through government. Thus policies will be designed to guide the economy in a direction to be believed most appropriate for society.

In order to view the interrelationship between social and environmental elements of the human ecosystem, it will be meaningful for the sake of simplicity to devide the system into five simplified groups of environmental elements:

(i) Natural environmental elements
(ii) Social environmental elements
(iii) Economic environmental elements
(iv) Environmental hazards
(v) Environmental quality considerations

The first three groups of elements are composed of relatively discrete aspects. The latter two are complex elements made up of two or more of the other elements considered together and acting or reacting in concert to create unique, definable characteristics of a geographic area.

4.1 Natural environmental elements

Natural environmental elements can be divided into physical and biological elements, comprising the representative environmental "actors and phenomena" in the summary of environmental dimensions in table 1.

Roughly, the natural environmental elements include each of the following:

- geology and geomorphology
- soils and subsoils
- meteorology and climatology
- hydrology
- vegetation and wildlife

Each of these elements may be further divided into a number of specific issues, which for the most are identified under the ECE list of environmental indicators.

4.2 Social environmental elements

Social environmental elements will partly comprise "representative environmental and individual-management actions" in table 1, which is "the work of man" and "man and his ideas", and will include each of the following:

- land use
- land tenure
- transportation and circulation

- history
- archaeology
- sociology (demography,man's physical habitat and production, consumption and socialization)
- political science
- visual and aesthetics (scenic resources and visual "blight" areas).

As for natural elements,each of these elements may be sub-divided into a number of specific issues, partly presented in the list of environmental and list of social indicators under the UN programme. For the most part, however, they represent a single social-science discipline.

It should be emphasized that most of these elements do have expressions in space(geographically mappable characteristics). However, the issues of some,particularly the last two, will require considerable study to be brought to the level of geographic representation possible with the natural environmental elements.

4.3 Economic environmental elements

The following economic environmental elements will have to be considered, comprising different parts of the "individual-management" dimension in the human ecosystem:

- land and other property values
- tax base
- income
- labour force
- business and industry
- municipal and social services and related costs.

It is indeed evident that these items relate to data normally utilized by a wide range of different disciplines.

4.4 Environmental hazards

Environmental hazards will comprise both natural and socio-economic hazards. Examples of natural environmental hazards are earthquakes, vulcanism, flooding, severe weather, etc. Socio-economic environmental hazards will for instance include depression/severe unemployment, epidemics/diseases, exposure to radiation,vandalism and traffic congestion.

Both types of hazards might result from several dimensions and interactions between the dimensions in the human ecosystem. The natural environmental hazards, however, will tend to occur as phenomena resulting from the "representative actions and the characteristics" of the environmental dimension in table 1.

Indeed it is vital to notice that environmental hazards are not mentioned under the UN programme - neither for social nor for environmental indicators.

4.5 Environmental quality considerations

Natural environmental quality considerations include, but are not necessarily limited to:

- air quality
- water quality
- wildlife habitat quality
- resource quality (geologic, vegetative and animal)
- noise/sound quality
- light quality

It is largely recognized that all of these overlap with socio-economic as well as natural environmental elements.

Socio-economic environmental quality considerations will include, but are not necessarily limited to:

- quality of life
- aesthetic quality

It is particularly evident that these latter considerations depend largely on the perspective and perceptability of the "viewer". Needless to say the concept of "the good life" for one person may be far different for another person.

Accordingly, data on the quality of life will be obtained through interviews with people on their perceptions etc. as opposed to data on for instance water quality, that is mainly measured by means of obtaining water tests, etc. The considerations on quality of life, therefore,

have to be approached with particular care and must of necessity be reflective of for instance the goals of communities for whom planning is being done.

5. INTEGRATION OF ENVIRONMENTAL STATISTICS AND SOCIAL STATISTICS

Environmental elements cannot be regarded in isolation and will in fact have to be considered within a human ecosystem. Accordingly, environment statistics should be intergrated with other statistical systems.

The paper on - "Links between environment and socio-demographic statistics", submitted to an ECE meeting on frameworks for environment statistics, 4-7 October 1982[1], states two approaches as to the intergration of environment statistics with other statistical systems:

(i) To draw social, demographic (and economic) indicators into the system of environment statistics in the narrow sense.

(ii) To assure the connexion of the environment statistical system with other statistical systems, already in the phase of its elaboration.

5.1 The UN Work Programme on Social Indicators

Preliminary guidelines and examples of social indicators were issued under the UN work programme in 1976[2]. The report gives examples of social indicators, based on illustrative series and classifications commonly used in building up the underlying bodies of basic social, demographic and related economic and other statistics.

The UN work on social indicators continued in order to keep work in this field under review, and a "Progress report on national and international work on social indicators" was issued in 1981[3]. The paper reviews different national activities in the field of social indicators, international activities likewise and the development of indicators within specific fields.

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1) Hungarian Central Statistical Office, 29 June 1982 (3).

2) ST/ESA/STAT/SER. M/63 (4).

3) ST/ESA/STAT/102, 15 July 1981 (5).

The following fields for which social indicators have been developed have been used in both the UN reports:

(A) Population
(B) Families and households
(C) Learning and educational services
(D) Earning activities and the inactive
(E) Distribution of income, consumption and accumulation
(F) Social security and welfare services
(H) Health, health services and nutrition
(I) Housing and the/its environment
(J) Public order and safety
(K) Time use
(L) Leisure and culture
(M) Social stratification and mobility

5.2 Preliminary list of social indicators with environmental dimensions

By comparing the list of classifications used in the specific fields for which social indicators have been developed[1] with the list of environmental indicators[2], one will have a result as shown in table 2, illustrating existing overlaps between social indicators and environmental dimensions as designed and developed under the UN programme[3].

Table 2 shows that overlaps mainly exist for indicators on "population" and on "housing and its environment". Although these fields of overlaps were to be expected, the indicators on population and housing are largely concerned with population and hounsing densities and are not as such of that much interest as concerns the environment. On the other

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1) ST/ESA/STAT/SER. M/63 (4) and ST/ESA/STAT/102 (5)

2) Task Force on the Study of Environmental indicators, ANNEX I

3) The evaluation of the table is based on a thorough survey of the definitions and descriptions of the social indicators that have been used to arrive at the preliminary guidelines and additional indicators under 1).

However, some of the overlaps may not be complete, meaning that there will exist different degrees for overlapping. Overlaps for instance referring only to parts of either the social indicator or the environmental indicator in question are marked especially.

TABLE 2
SOCIAL INDICATORS AND ENVIRONMENTAL DIMENSIONS

Social indicators \ Environmental dimensions	State of the environment								Interaction between development and environment					Ways and means of environmental management	
	Land	Human settlements	Soil	Subsoil	Forests	Water	Air	Natural and architectural heritage	Population and the urbanisation process	Production and the process of urbanisation	Infrastructure and transportation	Waste, radiation and noise		Ways and means	Environmental information systems/EIS/
A. POPULATION															
1. Sex, age									X						
2. Urban, rural		X							X						
3. Geographical area		X							X						
4. Size and type of place		X							X						
5. National or ethnic orgin															
B. FAMILIES AND HOUSEHOLDS															
1. Size and type of family nuclei															
2. Size and type of household		X													
C. LEARNING AND EDUCATIONAL SERVICES															
1. Level and field of education		} X							} X						
2. Type of education															
D. EARNING ACTIVITIES AND INACTIVE DISTRIBUTION OF INCOME, CONSUMPTION AND ACCUMULATION															
1. Type of activity			X*)												
2. Occupation															
3. Socio-economic group															
4. Percentile distributions of income															
E. SOCIAL SECURITY AND WELFARE															
1. Type of benefit															
2. Type of service															
F. HEALTH, HEALTH SERVICES AND NUTRITION															
1. Diseases, injuries and causes of death															
2. Impairments and handicaps															
3. Health services		X							X						
4. Nutrition standards and classifications															
G. HOUSING AND ITS ENVIRONMENT															
1. Characteristics and facilities of living quarters		X				X	X*)				X*)	X*)			
2. Type of tenure															
3. Energy															
H. PUBLIC ORDER AND SAFETY															
1. Offences and disposition															
2. Correctional services															
I. TIME USE															
1. Time use /activities															
J. LEISURE AND CULTURE															
1. Use of leisure-time															
2. Availability															
3. Area		X													
K. SOCIAL STRATIFICATION AND MOBILITY															
1. Social stratification															
2. Intra-generational mobility															
3. Intergenerational mobility															

*) Not complete overlaps

hand, if environmental data are being collected for similar geographical units as for population and housing, the existing overlaps in these fields would be of considerable environmental interest.

5.3 Environmental indicators with social concerns

Table 3 shows a comparison of the list of environmental indicators arrived at by the ECE Task Force with the main fields of social concerns under the UN programme, in fact illustrating existing overlaps between environmental indicators and social concerns [1].

By comparing table 2 and table 3 there will be a few more overlaps when distritibuting social concerns after environmental indicators (table 3). The main fields of existing overlaps are, however, under the environmental sub-groups of "human settlements" and "population and the urbanization process"[2].

5.4 Environmental elements and environmental dimensions: social concerns

The preliminary conclusion to be drawn from the evaluation of table 2 and table 3 is that there seem to be very few fields of overlap between social indicators under the UN programme and environmental indicators arrived at by the ECE Task Force. In order to investigate further, the environmental elements discussed in chapter 4 have been compared with the ECE environmental dimensions, illustrated in table 4.

Table 4 shows that some important dimensions are missing from the ECE list of environmental indicators, such as:

- meteorology and climatology
- wildlife[3] (except within natural and architectural heritage)
- vegetation (except for forests and within natural and architectural heritage)
- land tenure
- natural and socio-economic hazards

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1) There are no indicators that overlap with social indicators in the sub-groups of A.7, NATURAL AND ARCHITECTURAL HERITAGE, and C.12, WAYS AND MEANS OF ENVIRONMENTAL MANAGEMENT (see ANNEX I), and thus the sub-groups are not included in table 3.

2) See note 3), page 18.

3) Note that wildlife is included as a separate issue under the OECD State of the Environment Report (6).

T A B L E 3 ENVIRONMENTAL INDICATORS AND FIELDS OF SOCIAL CONCERN

Environmental indicators \ Fields of social concern	Population	Families and households	Learning and educational services	Earning activities, distribution of income, consumption and accumulation	Social security and welfare	Health, health services and nutrition	Housing and its environment	Public order and safety	Time use	Leisure and culture	Social stratification and mobility
A.1. LAND											
1. Land use											
A.2. HUMAN SETTLEMENTS											
1. Structure of human settlements	X	X									
2. Quality and utilization of economic activities and employment											
3. Quality and utilization of housing and public utility installations							X				
4. Quality and utilization of public facilities			X			X				X	
5. Degradation of human settlements											
6. Regeneration of human settlements											
A.3. SOIL											
1. Soil resources											
2. Quality of soil											
3. Soil use				X×)							
4. Degraded soils											
5. Renewal of soil											
6. Subsoil××)											
A.4. FORESTS											
1. Forest resources											
2. Quality of forests											
3. Use of forests											
4. Degradation of forests											
5. Regeneration of forests											
A.5. WATER											
1. Water resources											
2. Water quality							X				
3. Water utilization											
4. Degradation of water							X				
5. Water treatment							X				
A.6. AIR											
1. Air quality							X				
2. Air pollution by sources							X×)				
3. Air degradation in relation to population and vegetation											
4. Air pollution control							X×)				
A.7. NATURAL AND ARCHITECTURAL HERITAGE××)											
B.8. POPULATION AN THE URBANIZATION PROCESS											
1. Demographic characteristics of population	X										
2. Distribution and size of human settlements	X										
3. Socio-economic characteristics	X		X								
4. Population health characteristics						X					
B.9. PRODUCTION AND THE PROCESS OF URBANIZATION											
1. General activities structure											
2. Consumption of natural resources											
3. Technological process impact											
4. Emission of pollutants							X×)				
5. Environmental improvement through activities											
B.10. INFRASTRUCTURE AND TRANSPORTATION											
1. Structure and distribution of major infrastructural networks							X×)				
2&3 -Impact of infrastructure on the environment											
B.11. WASTE, RADIATION, NOISE											
1. Source and distribution of waste							X×)				
2. Waste treatment											
3. Impact of waste on the environment											
4. Noise impact							X×)				
5. Radiation impact											
C.12. WAYS AND MEANS OF ENVIRONMENTAL MANAGEMENT××)											

×) Not complete overlaps

××) There are no indicators in the sub-group that overlap with social indicators, thus the division of the sub-group(environmental indicators) is not presented

TABLE 4 ENVIRONMENTAL ELEMENTS AND ENVIRONMENTAL DIMENSIONS

Environmental elements \ Environmental dimensions	State of the environment								Interaction between development and the environment				Ways and means of environmental management	
	Land	Human settlements	Soil	Subsoil	Forests	Water	Air	Natural and architectural heritage	Population and the urbanization process	Production and the process of urbanization	Infrastructure and transportation	Waste, radiation, noise	Ways and means	Environmental information system
1. NATURAL ELEMENTS:														
1. Geology, geomorphology			X	X										
2. Soils, subsoils			X	X										
3. Meteorology, climatology														
4. Hydrology						X								
5. Vegetation, wildlife														
2. SOCIAL ELEMENTS:														
1. Land use	X				X									
2. Land tenure														
3. Transportation, circulation											X			
4. History								X						
5. Archaeology								X						
6. Sociology*)									X	X			X	
7. Political science													X	
8. Visual and aesthetics**)								X						
3. ECONOMIC ELEMENTS:														
1. Land/property values										X				
2. Tax base														
3. Income										X				
4. Labour force		X												
5. Business, industry										X				
6. Municipal and social services, related costs		X								X				
4. HAZARDS***):														
1. Natural hazards														
2. Socio-economic hazards														
5.a. NATURAL QUALITY CONSIDERATIONS:														
1. Air quality							X							
2. Water quality						X								
3. Wildlife habitat quality														
4. Resource quality			X	X	X									
5. Noise/sound quality												X		
6. Light quality														
5.b. SOCIO-ECONOMIC QUALITY CONSIDERATIONS:														
7. Quality of life	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
8. Aesthetic quality								X					X	

*) Including demography, man's physical habitat and production, consumption and socialization

**) Including scenic resources in the lanscape and visual "blight" areas

***) The two groups are not subdivided because of the complete lack of comments on hazards in the ECE list of environmental indicators

(X) Only partially represented in the ECE list

There seem to be problems with the high degreee of interdependence of the three sections in the ECE list, and apart from the block of "production and industrialization", links between the state of the environmental media and the development process hardly exist.

The working environment is missing in the ECE list of environmental indicators. In the list of environmental elements in table 4 working environment will fall into the element of "socio-economic hazards", comprising for instance diseases affecting man as a result from exposure to pollutants in the working environment, and into the element of socio-economic quality considerations of "quality of life". Environmental indicators on the working environment could, however, be grouped as presented under "natural quality considerations" in table 4 and would then indeed only concern physical aspects of the working environment.

The element concerning "quality of life" in table 4 is partially represented in the ECE list of environmental indicators. However, quality of life is not systematically presented, although different aspects of quality of life are implicit in all environmental dimensions (as marked in table 4).

Quality of life includes both social and natural dimensions which are of determinant character from the point of individual and social contentedness and human perception of life in general. These are the elements of the natural, social and economic environment including both environmental hazards and quality considerations. In fact, quality of life is the element that is most important both in social and in environmental statistics and thus will concern most indicators - as shown in table 4. Accordingly, socio-economic groups will vary in terms of the divison of the social indicators. Assuming a table illustrating social indicators and environmental elements, quality of life could fall into every one of the social indicators under the UN programme.

Consequently, if one chooses the approach of drawing social, demographic (and economic) indicators into the system of environment statistics in the narrow sense[1], the element of quality of life" in table 4 will have to be systematically represented under all environmental dimensions in the ECE list of environmental indicators.

6. POTENTIAL CONCERNS - SOCIAL INDICATORS AND ENVIRONMENTAL DIMENSIONS

The following list of indicators from the field of socio-demographic and environment statistics seem to overlap and might thus be subject to a further study, although, as commented upon earlier, the degree of overlap varies to a large extent:

- spatial/geographical distribution of population
- spatial distribution of settlements
- spatial mobility
- mortality
- health conditions
- cultural and educational levels
- quality of the environment/air and water pollution, noise, waste treatment, etc.
- physical elements of the quality of life.

However, some main links between socio-demographic and environment statistics seem to be missing, although they may be partially presented either in some of the ECE indicators or in the social indicators under the UN programme, such as for instance accessibility to elements of infrastructure (health care, education, leisure facilities, etc.).

Certain aspects of the quality of the environment ("quality of life") seem to be badly represented both under the UN programme and in the ECE list of environmental indicators and will thus need special focusing, such as for instance waste disposal and noise.

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1) Refer the paper on - "Links between environment and socio-demographic statistics, Hungarian Central Statistical Office, 1982 (3).

7. PRACTICAL PROBLEMS CONCERNING THE SELECTION OF ENVIRONMENTAL INDICATORS REPRESENTING MEANINGFUL SOCIAL INFORMATION - THE EXAMPLE OF NOISE

Environmental indicators for noise reflecting noise levels as an environmental and social problem, can represent the following concerns:

(i) Sources of noise, for instance noise from air terminals

(ii) Total amount of noise in a neighbourhood

(iii) Total number of dwellings exposed to noise

(iv) People's perception of noise

(v) The number of "diseases" that might result from severe noise problems within an area

(vi) Policy regulations (restrictions) concerning noise levels and the economic costs of such regulations.

The only possible way to integrate all the indicators is to provide a common geographical reference unit. Accordingly, it will be possible to establish a one to one correspondance between the different indicators provided the geographical unit is small enough. In practice, however, one will have to rely on established geographical units - as for instance census districts.

If the noise levels in question are not uniformly distributed throughout the census districts, one will face a problem of generalization of data during the process of constructing noise indicators. (As regards for instance describing carbon monoxide levels as an indicator of air pollution the generalization problem is even more serious).

To determine ways in which to measure different noise levels will represent still another practical problem. Regarding the specific type of environmental problem that noise represents, extreme levels of measurement might be of more interest than the arithmetic mean level. The duration of extreme high noise levels may represent more interesting environmental (and social) indicators than the mean noise level throughout a year. However, both types of information are important.

Methodological work describing such practical problems that relate to the selection of environmental indicators still seems to be lacking. However, in order to be able to choose the most effective indicator for different environmental problems, and indeed to obtain an analytical meaningful connextion (overlap) between environmental and social indicators, methodological work on such aspects will have to be included in the list of potential concerns.

ANNEX I : LIST OF INDICATORS DEVELOPED BY THE TASK FORCE ON THE STUDY OF ENVIRONMENTAL INDICATORS [1)]

A. STATE OF THE ENVIRONMENT

A.1. LAND

A.1.1. Land use
1. Patterns of land cover
2. Change in land use
3. Relative change in land use

A.2. HUMAN SETTLEMENTS

A.2.1. Structure of human settlements
1. Area of settlements by size categories
2. Structure of different land use functions
3. Floor space coefficients

A.2.2. Quality and utilization of economic activities and employment
1. Number of existing work places in relation to the active population
2. Accessibility of work places
3. Concentration of the investments by size of human settlement

A.2.3. Quality and utilization of housing and public utility installations
1. Number of households in relation to the number of dwellings
2. Residential floor area per inhabitant
3. Housing with running water
4. Road surface per inhabitant
5. Accessibility of public transportation
6. Inhabitants with running water
7. Inhabitants served by public sewer system
8. Inhabitants served by public refuse collection system

A.2.4. Quality and utilization of public facilities
1. Classroom floor per pupil
2. Accessibility of schools
3. Number of hospital beds per 1,000 inhabitants
4. Accessibility of public health facilities
5. Accessibility of food stores
6. Area of public green spaces per inhabitant

A.2.5. Degradation of human settlements

A.2.6. Regeneration of human settlements

A.3. SOIL

A.3.1. Soil resources

A.3.2. Quality of soil

A.3.3. Soil use
1. Agricultural land utilization

A.3.4. Degraded soils
1. Land degradation and loss
2. Use of chemicals that affect soils

A.3.5. Renewal of soil
1. Recultivated agricultural land

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1) Indicators underlined were selected to the restricted list of 40 indicators of priority interest.

A.3.a. SUBSOIL

A.3.a.1. Natural resource reserves
1. Estimated reserves of natural resources
A.3.a.2. Use of resources
1. Annual consumption
A.3.a.3. Degradation due to the exploitation of resources
1. Areas of degradation due to exploitation of subsoil
A.3.a.4. Rehabilitation of land degraded due to exploitation of resources
1. Area rehabilitated after the exploitation

A.4. FORESTS

A.4.1. Forest resources
1. Forest area per inhabitant
2. Standing crop per inhabitant
A.4.2. Quality of forests
1. Area by forest type
A.4.3. Use of forests
1. Consumption of raw timber in relation to annual increment
2. Forests used for economic purposes
3. Forests used for environmental protection
A.4.4. Degradation of forests
1. Degraded forests
A.4.5. Regeneration of forests
1. Afforestation and loss of forest areas

A.5. WATER

A.5.1. Water resources
1. Surface water resources per inhabitant
A.5.2. Water quality
1. Water quality according to classification
A.5.3. Water utilization
1. Water production per inhabitant
2. Consumption of water in relation to resources available
A.5.4. Degradation of water
1. Water pollution / concentration of pollutants/
A.5.5. Water treatment
1. Waste water disposal
2. Treated waste water

A.6. AIR

A.6.1. Air quality
1. Concentration of sulphur-dioxide
A.6.2. Air pollution by sources
1. Discharge of pollutants from human settlements
2. Discharge of pollutants from production of energy and from industry
3. Discharge of pollutants from transportation
4. Discharge of sulphur dioxide
A.6.3. Air degradation in relation to population and vegetation
1. Population percentage exposed to specified concentration of sulphur dioxide
2. Percentage of the air pollution in affected area by a primary pollutant
A.6.4. Air pollution control
1. Existence of standards for air pollution control

A.7. NATURAL AND ARCHITECTURAL HERITAGE

A.7.1. Wealth of recognized natural sites, flora and fauna
1. Area of natural sites
2. Wealth of valuable flora and fauna species

A.7.2. Protection of natural sites, flora and fauna
1. Natural sites under protection
2. Number of protected wildlife species

A.7.3. Management of natural areas
1. Natural areas under management

A.7.4. Wealth of recognized constructed sites
1. Percentage of the surface of human settlements occupied by recognized constructed sites and monuments

A.7.5. Protection of recognized constructed sites and monuments
1. Area of protected constructed sites

A.7.6. Management of recognized constructed sites and monuments
1. Recognized constructed sites and monuments under management

B. INTERACTION BETWEEN DEVELOPMENT AND ENVIRONMENT

B.8. POPULATION AND THE URBANIZATION PROCESS

B.8.1. Demographic characteristics of population
1. Natural population growth

B.8.2. Distribution and size of human settlements
1. Categorization of human settlements by size
2. Distribution of human settlements by size

B.8.3. Socio-economic characteristics
1. Population distribution by activities
2. Part of urban population
3. Part of population with secondary education

B.8.4. Population health characteristics
1. Infant mortality rate
2. Mortality rate classified by causes of death
3. Road traffic accidents rate per 100,000 inhabitants

B.9. PRODUCTION AND THE PROCESS OF URBANIZATION

B.9.1. General activities structure
1. Gross national product per capita or area / per km^2/
2. Industrial concentration
3. Activities that have an important environmental impact

B.9.2. Consumption of natural resources
1. Water consumption per capita and by sector
2. Energy consumption per capita and by sector
3. Vegetation consumption
4. Consumption of various livestock products

B.9.3. Technological processes impact

B.9.4. Emission of pollutants
1. Emissions of pollutants by some important industries
2. Quantity of industrial and agricultural pollutants

B.9.5. Environmental improvement through human activities

10. INFRASTRUCTURE AND TRANSPORTATION

B.10.1. Structure and distribution of major infrastructural networks
1. Distribution of population mobility according to various means of transportation
2. Density of standard track railway network
3. Road network density

4. Density of waterways
5. Water network density
6. Sewage network density
7. Density of the high-voltage distribution network
8. Gas and/or hot-water distribution network

B.10.2. Positive impact of infrastructure on the environment
1. Impact of the infrastructure network on development of human settlements

B.10.3. Negative impact of infrastructure on environment

B.11. WASTE, RADIATION, NOISE

B.11.1. Source and distribution of waste
1. Amount of waste formation /by sources/

B.11.2. Waste treatment
1. Ratio of reutilized wastes to the total amount of waste /by category/

B.11.3. Impact of waste on the environment

B.11.4. Noise impact

B.11.5. Radiation impact

C. WAYS AND MEANS OF ENVIRONMENTAL MANAGEMENT

C.12. WAYS AND MEANS

C.12.1. Legislation

C.12.2. Planning
1. Territory covered by spatial plans
2. Settlements covered by urban plans
3. Part of national territory covered by water management plans
4. Part of national territory covered by forest management plans

C.12.3. Investments in environmental management
1. Investments in housing and revitalization
2. Investments in communal infrastructure
3. Investments in soil management
4. Investments in forest management
5. Investments in water management
6. Investments in air quality protection
7. Investments and expenditures on the management and conservation of natural areas
8. Investments and expenditures on the management of historic sites and monuments

C.12.4. Research

C.12.5. Education

C.12.6. Environmental information system /EIS/
1. Part of characteristic group A indicators incorporated in the EIS
2. Part of regional - spatial plans based upon the EIS
3. Part of the urban plans based upon the EIS
4. Part of water management plans based upon the EIS
5. Part of forest management plans based upon the EIS

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