

9

SUMMARY AND CONCLUSIONS

Environment and development-related health effects are becoming of increasing concern world-wide, in both developing and developed countries. As problems become more complex and widespread, resources with which to tackle them are dwindling. New approaches needed to address the challenges must be based on integrated, holistic policy and planning mechanisms at all tiers of government, involving all relevant partners and sectors. In this connection, there is a clear need to improve information for policy- and decision-making, in order that it support the new ways of thinking and approaches to addressing cross-cutting problems.

This document has attempted to lay the basis for the development and use of health and environmental indicators in sustainable development planning. It is emphasized that indicators are most effective if they are developed as part of the overall policy and planning process, whether this occurs at the national or the local level. More work is needed to evaluate the use and effectiveness of indicators in this regard.

On a global scale, indicators have a role to play in facilitating comparisons of health and environmental conditions and trends world-wide, and also in providing information on the development of policies to address global problems. It is recognized however, that it is difficult to develop for this purpose 'core' indicators which are both universally applicable and universally measurable. Nevertheless, this book has provided a basis from which core sets of indicators might be developed for various purposes, as well as an organizational framework for the development of indicators.

In order to manage health, environment and development hazards more effectively in the future, decision-makers in various fields should develop and use appropriate indicators, so that the information provided is as useful and meaningful as possible for policy and planning at all levels. The public must also become more closely involved in indicator development and use.

Shortcomings of data bases and information systems remain a major problem worldwide, including data collection and systems of analysis, and information dissemination. Some indicators demand special monitoring systems and have significant resource implications. It is therefore essential that they are developed in as efficient and effective a way as possible, the ultimate aim being improved decision-making. In this regard there remains a key need to harmonize indicator development systems at all levels and tiers of government, on both a national, as well as international level.

10

ACKNOWLEDGEMENTS

I would like to acknowledge the many individuals who provided useful and thoughtful comments on the various drafts of the book and/or who participated in meetings to review the book.

Dr H. Abouzaid, EMRO, Alexandria, Egypt

Dr A. Aitio, Finnish Institute Occupational Health, Helsinki, Finland

Dr M. Akerman, Centro de Estudos de Cultura Contemporanea (CEDEC), Sao Paolo, Brazil

Dr M. Ali Khan, Regional Centre for Environmental Health Activities (CEHA), Amman, Jordan

Dr F. Barten, Nijmegen University, Nijmegen, The Netherlands

Professor D. Briggs, Nene College, Northampton, UK

Dr N. Bruce, University of Liverpool, Liverpool, UK

Dr D. Davis, World Resources Institute, Washington D.C., USA

Dr C. Dora, European Centre for Environment and Health, Roma, Italy

Dr R. Fehr, Landesinstitut für den Öffentlichen Gesundheitsdienst NRW, Bielefeld, Germany

Dr L. Galvao, WHO Regional Office for the Americas (AMRO), Washington D.C., US

Mr P. Garau, UNCHS, Europe Office, Geneva, Switzerland

Professor H. Gopalan, UNEP, Nairobi, Kenya

Professor L. Hens, Free University of Brussels, Brussels, Belgium

Dr M. Hota, Ministry of Environment and Forests, New Delhi, India

Dr M. Jaghabir, University of Jordan, Amman, Jordan

Mr A. Kahnert, UN Economic Commission for Europe, Geneva, Switzerland

Dr T. Kaminuma, National Institute for Health Sciences, Tokyo, Japan

Dr G. Kee Tai, Ministry of the Environment, Singapore

Professor C. Kerr, University of Sydney, NSW, Australia

Dr R. Kersauze, WHO Nancy Project Office, Nancy, France

Dr M. Krzyzanowski, European Centre for Environment and Health, Bilthoven, The Netherlands

Dr A. Kuchuk, European Centre for Environment and Health, Bilthoven, The Netherlands

Dr A. Kyle, University of California, Berkeley, USA

Dr R. Lawrence, University of Geneva, Geneva, Switzerland

Dr J. Listorti, World Bank, Washington D.C., USA

Mr L. Ludvigsen, UNCHS, Geneva Office, Geneva, Switzerland

Ms A. Mathee, Medical Research Council, South Africa

Dr P. Penttilä, National Food Administration, Helsinki, Finland

Professor P. Peterson, University of London, London, UK

Dr J. Rantanen, Finnish Institute Occupational Health, Helsinki, Finland

Dr A. Sattar Yoosuf, WHO Regional Office for South-East Asia (SEARO), New Delhi, India

Mr J. Schelp, Department of Health and Human Services, Washington D.C., USA

Professor Dr Schlottmann, Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, Bonn, Germany

Professor K. Smith, University of California, Berkeley, USA

Dr C. Stephens, London School of Hygiene and Tropical Medicine, London, UK

Dr E. Torres, University of the Philippines, Manila, Philippines

Ms M. Vrabete, Technical University of Cluj Napoca, Cluj Napoca, Romania

Dr H. Wyes, European Centre for Environment and Health, Bilthoven, The Netherlands

Mr C. Corvalan, Mrs B. Goelzer, Dr G. Goldstein, Dr T. Kjellstrom, Dr S. Litsios, Dr M. Mercier, Dr M. Parkes, Dr H. Pastides, Dr S. Sapirie, Dr S. Simeant, Ms J. Sims, Dr H. Tamashiro, Dr J. Visschedijk, Dr D. Yach and others working or based at the time at WHO.

Special thanks to Ms A. Mathee, S.A. Medical Research Council, for assistance with the preparation of case studies.

Mr Michel Paysant is thanked for the layout and Mrs Marie-Claude van Holten for assistance with the preparation of the book.

Financial assistance from the Canadian International Development Agency (CIDA), Health Canada, the Swedish International Development Agency (SIDA) and the Federal Republic of Germany is gratefully acknowledged.

11

REFERENCES

1. WHO (1998) *Health-for-All in The 21st Century*, Geneva
2. World Resources Institute, UNEP, UNDP & the World Bank (1998). *1998-1999 World Resources: A Guide to the Global Environment. Environmental Change and Human Health*. Oxford University Press, Oxford/New York
3. Kreisel, W. (1990) Quoted in Rice, M. & Rasmusson, E. (1992) *Healthy cities in developing countries (Ch. 9)*. In: Ashton, J., ed., *Healthy Cities*, Buckingham, Bristol, PA, Open University Press
4. WHO (1989) *Environment and Health: The European Charter and Commentary*. First European Conference on Environment and Health, Frankfurt, Germany, 7-8 December 1989, Geneva
5. Dowdeswell, E. (1996) Quoted in foreword to: *The Local Agenda 21 Planning Guide: An Introduction to Sustainable Development Planning*, Toronto, ICLEI, IDRC and UNEP
6. Goldstein, G. and Kickbusch, I. (1996) *A Healthy City is a Better City*. *World Health*, 49 (1) Jan/Feb
7. WHO (1997) *Health and Environment in Sustainable Development*, Geneva
8. Murray, C. & Lopez, A. (1996) *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries and Risk Factors in 1990 and Projected to 2020*. Harvard University Press
9. von Schirnding, Y. (1997) *Intersectoral Action for Health: Addressing Health and Environment Concerns in Sustainable Development*, WHO Geneva
10. von Schirnding, Y. (1998) *Addressing Health and Environment Concerns in Sustainable Development, with Special Reference to Participatory Planning Initiatives such as Healthy Cities*. *Ecosystem Health* 1998, 3 (4): 220-228
11. United Nations (1993) *Agenda 21: Programme of Action for Sustainable Development*.
12. World Commission on Environment and Development (1987) *Our Common Future*, Oxford University Press, Oxford
13. United Nations (1996) *Report of the United Nations Conference on Human Settlements (HABITAT II)*, Istanbul, Turkey, 3-14 June, New York
14. Ottawa Charter for Health Promotion. *First International Conference on Health Promotion*, 17-21 November 1986, Ottawa, Canada

15. Haglund, B., Pettersson, B., Finer, D. & Tillgren, P. eds (1996) *Creating Supportive Environments for Health: Stories from the Third International Conference on Health Promotion*, Sundsvall, Sweden, Geneva, WHO
16. WHO (1992) *Commission on Environment and Health, Our Planet, Our Health*, Geneva
17. WHO (1993) *Health, Environment and Development: Approaches to Drafting Country -level Strategies for Human Well-being under Agenda 21*, Geneva
18. International Council for Local Environmental Initiatives (1996) *The Local Agenda 21 Planning Guide: An Introduction to Sustainable Development Planning*, Toronto, ICLEI, IDRC and UNEP
19. OECD (1993) *OECD Core Set of Indicators for Environmental Performance Reviews (Environmental Monograph 83)*, Paris, France
20. UNEP/RIVM (1994) *An Overview of Environmental Indicators: State of the Art and Perspectives* (UNEP/EATR.94-01; RIVM/402001001), Nairobi
21. Peterson, P.J. (1997) *Indicators of Sustainable Development in Industrialising Countries. Lestari Monographs*. Penerbit University, Kebangsaan, Malaysia
22. Briggs, D., Corvalan, C. & Nurminen, M. (1996) *Linkage Methods for Environment and Health Analysis*, Geneva, UNEP/US EPA/WHO
23. Hammond, A., Adriaanse, A., Rodenburg, E., Bryant, D. & Woodward, R. (1995) *Environmental Indicators: A Systematic Approach to Measuring and Reporting on Environmental Policy Performance in the Context of Sustainable Development*, Washington D.C., World Resources Institute
24. U.K. Department of the Environment, Transport and the Regions (DETR) (1998) *Sustainability Counts: Consultation Paper*, London, United Kingdom
25. U.K. Department of Environment, Transport and the Regions (DETR) (1999) *Quality of Life Counts. Government Statistical Service*, London, United Kingdom
26. Atallah, S. and Khan, A. (1998) *Towards a Regional Approach for Environmental Health Monitoring in WHO's Eastern Mediterranean Countries. Symposium on the Role of Epidemiology in Decision-making*, Internal Society of Environmental Epidemiology, 15-19 August 1998, Boston, USA
27. SCOPE (1995) *Environmental Indicators: A Systematic Approach to Measuring and Reporting on the Environment in the Context of Sustainable Development*. In: Workshop on Indicators of Sustainable Development for Decision-making, Ghent, 9-11 January
28. World Bank (1994) *Monitoring Environmental Progress: A Report of Work in Progress*, Washington D.C.
29. World Resources Institute (1995) *Environmental Indicators: A Systematic Approach to Measuring and Reporting on Environmental Policy in the Context of Sustainable Development*, New York

30. United Nations (1996) *Indicators of Sustainable Development: Framework and Methodologies*, New York
31. World Bank (1996) *Social Indicators of Development*. Johns Hopkins University Press, Baltimore and London
32. UNCHS (1995) *Monitoring Human Settlements: Abridged Survey*, Nairobi, Kenya
33. UNCHS (1995) *Human Settlement Interventions Addressing Crowding and Health Issues*, Nairobi, Kenya
34. van de Water, H. & van Hertem, L. (1996) *Bull's Eye or Achilles' Heel: WHO's European Health for All Targets Evaluated in the Netherlands*, Bilthoven, TNO Prevention and Health
35. WHO (2000) *World Health Report*, Geneva
36. WHO (1996) *Catalogue of Health Indicators: A Selection of Important Health Indicators Recommended by WHO Programmes*, Geneva
37. WHO (1996) *Evaluating the Implementation of the Strategy for Health for All by the Year 2000*. Common framework: 3rd Evaluation, Geneva
38. PAHO/WHO (1997) *Basic Indicators 1997*, Washington D.C.
39. WHO (1996) *Indicators for Assessing Vitamin A Deficiency and Their Application in Monitoring and Evaluating Intervention Programmes*, Geneva
40. WHO (1994) *Indicators for Monitoring National Drug Policies*, Geneva
41. WHO (1989) *Evaluation of Programmes to Ensure Food Safety*, Geneva
42. WHO (1995) *Health and environment analysis and indicators for decision-making*. World Health Stat. Q., 48 (2), Geneva
43. Briggs, D. (1999) *Environmental Health Indicators: Framework and Methodologies*. WHO, Geneva
44. WHO (1996) *Healthy Cities Indicators: Analysis of Data from Across Europe*, WHO Regional Office for Europe (EURO), Copenhagen
45. United Nations (2000) *Progress Report on Basic Indicators for the Integrated and Coordinated Implementation and Follow-up to Major UN Conferences and Summits at All Levels*. Report of the Secretary general. E/1999/11
46. Plan Canada (1999) *Sustainable Community Indicators Program*, November 1999, Vol. 39, N° 5
47. Local Government Management Board (1997) *The Sustainability Indicators Research Project: Indicators for Local Agenda 21 - A Summary*. LGMB, United Kingdom
48. Thomas, V. (1995) *The Elimination of Lead in Gasoline*. Annual Review of Energy and the Environment, 20

49. WHO (1990) *Joint UNEP/FAO/WHO Food Contamination Monitoring Programme* WHO/EHE/FOS/90.2), Geneva
50. UNEP/WHO (1993) *GEMS AIR - Global Environmental Monitoring System: A Global Programme for Urban Air Quality Monitoring and Assessment* (WHO/PEP93.7; UNEP/GEMS/93.A.I.), Nairobi, UNEP
51. Briggs, D. (1995) *Building a geographical information system in the European Community: The CORINE experience*. In: de Lepper, M.J.C., Scholten, H. & Stern, R., eds, *The Added Value of Geographical Information Systems in Public and Environmental Health*, Dordrecht: Kluwer Academic Publishers
52. World Bank (1997) *Clear Water, Blue Skies: China's Environment in the New Century*. Washington D.C.
53. World Bank (1994) *Better Health in Africa: Experience and Lessons Learned*, Washington D.C.
54. United Nations (1997) *Critical Trends: Global Change and Sustainable Development*, New York
55. Local Government Management Board (1996) *The Sustainability Indicators Research Project*. Consultants Report of the Pilot Phase. LGMB, United Kingdom
56. US Inter-agency Working Group on Sustainable Development Indicators (1998) *Sustainable Development in the United States: An Experimental Set of Indicators*. December 1998, Washington D.C.
57. von Schirnding, Y., Bradshaw, D., Fuggle, R., Stokol, M. *et al.* (1991) *Blood Lead Levels in South African Inner-City Children*. Environmental Health Perspectives, 94
58. World Bank (2000) *Entering the 21st Century. World Development Report 1999/2000*. Oxford University Press
59. WHO (1999) *Declaration of the Third Ministerial Conference on Environment and Health*. WHO Regional Office for Europe (EURO), Copenhagen
60. PAHO/WHO (1996) *An Opportunity for Change and A Call to Action*. Pan American Conference on Health and Environment in Sustainable Human Development, Washington D.C.
61. WHO (1996) *Beirut Declaration on Action for a Healthy Environment*. WHO Regional Office for the Eastern Mediterranean (EMRO), Alexandria, Egypt
62. WHO (1995) *The Healthy Route to a Sustainable World: Health, Environment and Sustainable Development*, Geneva
63. U.K. Department of the Environment (1996) *The United Kingdom National Environmental Health Action Plan*, London, United Kingdom

64. Strong, M. Quoted in foreword to: *The Local Agenda 21 Planning Guide: An Introduction to Sustainable Development Planning*, Toronto, Canada. ICLEI, IDRC and UNEP
65. WHO (1995) *Twenty Steps for Developing a Healthy Cities Project*, 2nd Ed., WHO Regional Office for Europe (EURO), Copenhagen
66. WHO (1995) *Building a Healthy City: A Practitioner's Guide - Step-by-Step Approach to Implementing Healthy City Projects in Low-income Countries*, Geneva
67. WHO (1996) *Creating Healthy Cities in the 21st Century*. Background Paper, United Nations Conference on Human Settlements, 3-14 June, Istanbul, Turkey
68. UNCHS/UNEP (1996) *SCP' 96: The First Annual Meeting of the Cities Associated with the Sustainable Cities Programme*, Istanbul, Turkey, 31 May 1996
69. UNCHS/UNEP (1996) *Implementing the Urban Environment Agenda: Report on the Global Meeting of Cities and International Programmes during Habitat II*, Istanbul
70. Ashton, J. (1992) (ed) *Healthy Cities*, Buckingham, Bristol, PA: Open University Press
71. Davies, J. & Kelly, M. (1993) *Healthy Cities: Research and Practice*, London: Routledge Press
72. Goldstein, G. (1996) WHO *Healthy Cities: Towards an Interregional Programme Framework* (Chap. 22). In: *Our Cities Our Future: Policies and Action Plans for Health and Sustainable Development*, eds, Price, C., and Tsouros, A. WHO Healthy Cities Project Office, Copenhagen
73. WHO (undated) *WHO Healthy Cities Project: A Project Becomes a Movement*. Review of Progress 1987-1990. WHO Regional Office for Europe (EURO), Copenhagen
74. WHO (1996) *Building a Healthy Village: Concept and Practice. A Step-by-Step Approach to Implementing Healthy Villages Projects*, Geneva
75. WHO (1996) *Kuching, Malaysia: Working Towards a Vision*. Case Study in: World Health Day: Healthy Cities for a Better Life, 7 April, Geneva
76. United Nations (1995) *Dubai International Conference for Habitat II on Best Practices in Improving the Living Environment*, New York
77. Green, G. (1992) *Liverpool (Ch. 10)*. In: Ashton, J., ed., *Healthy Cities*, Buckingham, Bristol, PA: Open University Press
78. Hunt *et al.* (1999) *Community-based Environmental Health Indicators: A Useful Tool in Facilitating Dialogue Between Communities and Planners?* Urban Health & Development Bulletin 2 (2)

79. Cole, DC., Pengelly, LD., Eyles, J., Stieb, DM. & Hustler, R. (1999) *Consulting the Community for Environmental Health Indicator Development: the Case of Air Quality*. Health Promotion International, 14 (2), 145-154
80. Rider, M. & Flynn, B. (1992) *Indiana (Ch. 21)*. In: Ashton, J., ed., *Healthy Cities, Buckingham, Bristol*, PA, Open University Press
81. Costa, J. (1992) *Barcelona (Ch. 15)*. In: Ashton, J., ed., *Healthy Cities, Buckingham, Bristol*, PA: Open University Press
82. Soton, A., Alihonou, E., Gandaho, T. et al. (1997) *Environmental Health Indicators for Decision-making: A Case Study in Cotonou, Benin*. Urbanization & Health Newsletter 1997, 33. Medical Research Council, South Africa
83. van Hertem, L. & van de Water, H. (1999) *New global health for all targets*. BMJ 319(7211):700
84. Health Targets: *News and Views* (1999) 2 (2), Merck & Co, New Jersey, USA
85. WHO/EURO (1998) *Health 21 - Health for All in the 21st Century*. European HFA series N° 5, WHO Copenhagen
86. Nakamura, K. & Takano, T. (1996) *A Megacity's Approach: Tokyo Healthy City* (Chap. 12). In: *Our Cities Our Future: Policies & Action Plans for Health and Sustainable Development*, eds Price, C. & Tsouros A., WHO Healthy Cities Project Office, Copenhagen
87. Brugmann, J. (1997) *Is There A Method In Our Measurement? The Use of Indicators in Local Sustainable Development Planning*. Local Environ., 2
88. International Council for Local Environmental Initiatives (1996) *Santa Monica sustainability indicators: Measuring performance in achieving local targets*. Case study. In: *The Local Agenda 21 Planning Guide: An Introduction to Sustainable Development Planning*, Toronto, ICLEI, IDRC and UNEP
89. Sustainable Seattle: *Indicators of Sustainable Community* (1995) *A Status Report on Long-term Cultural, Economic & Environmental Health Sustainable Seattle Indicators*
90. International Council for Local Environmental Initiatives (1996) *Sustainable Seattle: Measuring progress towards "sustainability"*. Case study. In: *The Local Agenda 21 Planning Guide: An Introduction to Sustainable Development Planning*, Toronto, Canada. ICLEI, IDRC, and UNEP
91. U.K. Department of the Environment, Transport and the Regions (DETR) (1999) *Monitoring Progress*, London, United Kingdom
92. Finnish Environment Institute (1999) *Development and Testing of Sustainable Development Indicators in Finland, 1996-1999*, Finland
93. Commonwealth of Australia (1994) *State of the Environment Reporting: Framework for Australia*. Department of the Environment, Sport and Territories, Canberra ACT, Australia

94. Harvard (1996) *Environmental Indicators*. Report N° TA 5542-Reg., 5 January. Asian Development Bank/Government of Norway, Environmental Systems Programme. Harvard University
95. WHO (1990) *The Impact of Development Policies on Health*, Geneva
96. Rutter, M. & Russel, J. (1983) *Lead versus Health: Sources and Effects of Low Level Lead Exposure*, Chichester: Wiley
97. von Schirnding, Y. (1997) *Environmental Epidemiology* (Chap. 23). In: *Epidemiology: A Manual for South Africa*, eds, Katzenellenbogen, J., Joubert, G. & Abdool Karim, S..Oxford University Press, Cape Town
98. von Schirnding, Y. (1999) *Rapid Assessment of Air Pollution & Health: Making Optimal Use of Data for Policy and Decision-Making*. In: *Health & Air Pollution in Developing Countries*, eds, McGranahan G. and Murray F., Stockholm Environment Institute, Stockholm
99. WHO (1983) *Guidelines on Studies in Environmental Epidemiology* (Environmental Health Criteria 27), Geneva
100. Mara, D. & Alabaster, G. (1995) *An Environmental Classification of Housing-Related Diseases in Developing Countries*. *Journal of Tropical Medicine & Hygiene*, 98 (41-51)
101. WHO (1989) *Health Principles of Housing*, Geneva
102. World Resources Institute, UNEP, UNDP & the World Bank (1996). *1996-1997 World Resources: A Guide to the Global Environment. The Urban Environment*. Oxford University Press, Oxford/New York
103. Seymour, J. (1996) *Trafficking in Death*. *New Scientist* 14 September 1996

