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**WORLD HEALTH ORGANIZATION  
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MEETING OF THE PARTIES TO THE  
PROTOCOL ON WATER AND HEALTH  
TO THE CONVENTION ON THE PROTECTION  
AND USE OF TRANSBOUNDARY  
WATERCOURSES AND INTERNATIONAL  
LAKES

Working Group on Water and Health

First meeting  
Geneva, 26–27 June 2008  
Item 6 of the provisional agenda

DEVELOPMENT OF TARGETS AND INDICATORS

**PROPOSED TARGETS AND INDICATORS OF PROGRESS ACCORDING TO  
ARTICLE 6, PARAGRAPH 2 (A) TO (G) OF THE  
PROTOCOL ON WATER AND HEALTH**

Draft guideline by the Task Force on Indicators and Reporting<sup>1</sup>

**I. BACKGROUND**

1. The present document was prepared by the Task Force on Indicators and Reporting, which had its first meeting on 13 and 14 March 2008 in Geneva. This meeting was prepared by a core group on indicators and reporting, which met on 22 and 23 January in Geneva. The document was prepared following the decision of the first meeting of the Parties to entrust the

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<sup>1</sup> The present document was submitted late due to resources constraints.

Task Force with the preparation of guidelines for target-setting for all targets under article 6, paragraphs (a) to (n) (see the programme of work for 2007–2009 adopted at the first meeting of the Parties, ECE/MP.WH/2/Add.5 - EUR/06/5069385/1/Add.5). The present document includes targets and indicators for article 6, paragraphs a) to g), those for article 6, paragraphs h) to n) are presented in document ECE/MP.WH/WG.1/2008/L.3 - EUR/08/5086340/11.

2. At their first meeting (Geneva, 17–19 January 2007), the Parties to the Protocol on Water and Health established the Working Group on Water and Health as an open-ended subsidiary body responsible for the overall implementation of the programme of work. In accordance with its terms of reference, the Working Group: (a) reviews progress achieved, in particular by the different task forces; (b) proposes modifications to the work programme to adapt to changing conditions; and (c) reports to the Meeting of the Parties (see ECE/MP.WH/2/Add.2 - EUR/06/5069385/1/Add.2 and ECE/MP.WH/2/Add.5 - EUR/06/5069385/1/Add.5).

3. The annex to this document, which should be read together with documents ECE/MP.WH/WG.1/2008/L.1 - EUR/08/5086340/9 and ECE/MP.WH/WG.1/2008/L.3 - EUR/08/5086340/11, will become an integral part of the guidelines.

4. Due to time constraints during the meeting, the Task Force on Indicators and Reporting was able to discuss only the options presented for targets and indicators for article 6, paragraphs 2 (a) to (g). Subsequently, the joint secretariat requested Parties and Signatories to submit written comments, which have also been integrated in the present document.

5. At the meeting, the Task Force reiterated that the process of target-setting completely depends on the situation and priorities in the different Parties. However, it also recognized the need for regional harmonization as well as that the Protocol requires Parties to cooperate and develop commonly agreed targets and consistent reporting.

6. Consequently, the guidelines will include two kind of indicators for target-setting:

(a) A core set of common indicators, which will be part of the reporting system under the Protocol and should thus be used by all Parties. The Task Force recommended the use of common (mandatory) indicators for targets set in accordance with article 6, paragraphs 2 (a) to (d);

(b) Possible options for targets that Parties could set in accordance with article 6, and on related indicators that would allow for measuring progress vis-à-vis the achievement of these targets.

## **II. FUTURE WORK TO BE UNDERTAKEN BY THE TASK FORCE ON INDICATORS AND REPORTING**

7. The guidelines for target-setting as well as the options for targets and indicators will be revised and further elaborated by the core group on indicators and reporting and the Task Force. They will also be enriched with experience collected at the workshop on target-setting and reporting scheduled to be held on 2 and 3 December 2008 and further elaborated at the second

meeting of the Task Force (4 December 2008). The guidelines are expected to be finalized by the Task Force's third meeting, tentatively scheduled for March 2009.

### **III. PROPOSED ACTION BY THE WORKING GROUP ON WATER AND HEALTH**

8. The Working Group on Water and Health is invited to comment on this document and provide recommendations for further work to be undertaken by the Task Force on Indicators and Reporting and its core group.

9. In particular, the Working Group is invited to discuss and agree on:

(a) The set of core (mandatory) indicators to be used by all Parties recommended by the Task Force and the need for additional mandatory indicators;

(b) How Parties which have already set their targets should behave in case of inconsistency with mandatory indicators.

## Annex

### **PROPOSED TARGETS AND INDICATORS OF PROGRESS ACCORDING TO ARTICLE 6, PARAGRAPH 2 (A) TO (G) OF THE PROTOCOL ON WATER AND HEALTH**

#### **I. GENERAL PRINCIPLES FOR SETTING TARGETS AND DEFINING INDICATORS**

1. This introductory part will include general principles to be taken into account when setting targets and adopting indicators as well as explanations on how to use the guidance provided:

(a) In setting targets and defining indicators, Parties should strive for comprehensiveness. Developing a holistic, integrated knowledge of water, environment and health issues is the main objective of the Protocol and its greatest added value;

(b) Thus, targets set in different areas should be based on a holistic view of the issues and aim at achieving an integrated objective. Different combinations of targets can enable achievement of the same results and Parties should decide on the basis of their specific situations. For example, Parties might set the same target for water quality, but achieve this in different ways, either through prevention of pollution or through treatment of polluted water;

(c) A comprehensive picture is an important asset for donors and can facilitate access to sources of funding, in particular through the Protocol's Ad Hoc Project Facilitation Mechanism;

(d) Targets and indicators should be clear, transparent and understandable to consumers;

(e) The Protocol does not aim to compare the situations in different countries, but requires the setting of national and/or local targets and the monitoring of progress against these targets achieved by each Party. Parties may be expected to set selective and different targets, resulting in the adoption of different indicators. While the present text is a compilation of possible indicators, it is not meant to be exhaustive. However, for the sake of regional harmonization, the Protocol requires Parties to cooperate and develop commonly agreed targets, comparable indicators and consistent reporting;

(f) In the following compilation, some targets are just proposed as possible options. The compilation does not aim at promoting a specific approach;

(g) At the same time, core indicators related to the quality of water supplied (art. 6, para. 2 (a)), reduction of the scale of outbreaks and incidents of water-related disease (art. 6, para. 2 (b)), access to drinking water (art. 6, para. 2 (c)), access to sanitation (art. 6, para. 2 (d)),

and [to be completed] should be common and adopted by all Parties and should be used in the reporting system to the Meeting of the Parties;

(h) When selecting targets and indicators, Parties should take into account legal obligations, existing monitoring systems, and international and national reporting systems;

(i) The proposed indicators are mostly based on indicators used/suggested for various reports to or by organizations and programmes in the United Nations system. Reporting obligations faced by European Union (EU) Member States resulting from the *acquis communautaire* and other sub-regional reporting mechanisms have likewise been taken into account (e.g. the European Environment Agency and Eurostat);

(j) It seems wise to recognize that ultimately environment and health information will need to be presented in a way that is more integrated than through a collection of single parameter indicators. Parties are therefore invited to consider possible numeric integrative indicators, or to consider the possibilities of recommending the use of systems that allow for the compilation of individual datasets, e.g. GIS;<sup>2</sup>

(k) Emerging issues such as climate change adaptation should also be taken into account in setting targets and defining indicators. In this regard, the work carried out by the Task Force on Extreme Weather Events should be considered;

(l) Targets and related indicators can be qualitative or quantitative; however Parties should ensure adopting quantitative indicators for key selected issues so as to objectively assess progress. Where a qualitative approach is preferred, Parties are invited to adhere to the technical meaning of environment and health terms as defined in the WHO Lexicon;<sup>3</sup>

(m) Targets can be set at the national and/or local levels. When national targets are set, special attention should be made to properly reflect them at the local level, focusing on the areas with the main problems.

## II. THE QUALITY OF THE DRINKING WATER SUPPLIED (ART. 6, PARA. 2 (a))

### A. Background rationale

2. Article 6, paragraph 2 (a), of the Protocol requires the setting of targets and target dates regarding the quality of the drinking water supplied, taking into account the WHO<sup>4</sup> Guidelines

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<sup>2</sup> Geographic Information Systems.

<sup>3</sup> See [http://www.who.int/water\\_sanitation\\_health/thelexicon/en/](http://www.who.int/water_sanitation_health/thelexicon/en/).

<sup>4</sup> World Health Organization.

for Drinking-Water Quality.<sup>5</sup> This includes the microbiological and chemical aspects of drinking water quality.

3. Comprehensive compliance reporting as required by the EU Drinking Water Directive<sup>6</sup> might be too labour-intensive, and could lead to reporting on parameters that are irrelevant for the Party in question. Nevertheless, elements may be selected by Parties to meet the needs of the Protocol.

#### **B. Common indicators for all Parties which will become part of the reporting mechanism**

4. The following indicators are based on the Environment and Health Information System developed by WHO in cooperation with the European Commission (full background information, including methodological development, is available at: [www.enhis.org](http://www.enhis.org)):

(a) *WatSan\_S2*. Percentage of samples that fail to meet the standard for *E. coli* and percentage of samples that fail to meet the standard for *Enterococci*;

(b) *WatSan\_S3*. Percentage of samples that fail to meet the standard for chemical water quality, with individual Parties to identify those health-relevant chemical parameters that are of special concern in their national or local situation. All countries shall monitor and report on: Fluoride, nitrate and nitrite, arsenic, lead<sup>7</sup> and iron;

(c) Moreover, each Party shall define five additional priority substances, and set targets and report on these;

(d) 2005, the year of entry into force of the Protocol, shall be used as baseline for reporting.

#### **C. Additional approach to setting targets and indicators**

5. Depending on the national situation, special targets can be set for quality of drinking water in rural settlements and small towns with decentralized and/or small-scale systems.

#### **D. Relevant global and regional obligations and reporting systems**

6. EU Member States are obliged under Article 13 (2) of the EU Drinking Water Directive 98/83/EC to publish a report every three years on the quality of water intended for human consumption with the objective of informing consumers. Each report shall include, as a

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<sup>5</sup> WHO, 2004. *Guidelines for Drinking-Water Quality* (Third edition), Volume 1: Recommendations. Geneva, WHO. Available at: [http://www.who.int/water\\_sanitation\\_health/dwg/gdwg3/en/index.html](http://www.who.int/water_sanitation_health/dwg/gdwg3/en/index.html)

<sup>6</sup> Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption. Available at: ([http://europa.eu.int/eur-lex/pri/en/oj/dat/1998/l\\_330/l\\_33019981205en00320054.pdf](http://europa.eu.int/eur-lex/pri/en/oj/dat/1998/l_330/l_33019981205en00320054.pdf)).

<sup>7</sup> After the decision taken on this item at the Task Force meeting, Hungary submitted a request to delete lead, as it is not a problem for many Parties and is difficult to monitor.

minimum, all individual supplies of water exceeding 1,000 m<sup>3</sup> a day as an average or serving more than 5,000 persons, and shall cover three calendar years and be published within one calendar year of the end of the reporting period. The Directive specifies specific parameters through Article 5 (2) and (3) and monitoring programmes through Article 7 (2).

7. In developing a national or local assessment, Parties may wish to take into consideration recent guidance material developed by WHO.<sup>8</sup>

### **III. THE REDUCTION OF THE SCALE OF OUTBREAKS AND INCIDENTS OF WATER-RELATED DISEASE (ART. 6, PARA. 2 (b))**

#### **A. Background rationale Background rationale**

8. Article 6, paragraph 2 (b), of the Protocol requires the setting of targets and target dates related to the reduction of the scale of outbreaks and incidents of water-related disease. Article 8 specifies the national and local actions to be taken to develop surveillance and response systems. Safe drinking and bathing water is vital for the health of the population, particularly children. The number of outbreaks of water-related diseases provides an indication of the quality of the drinking or bathing water and are linked to the performance of the water supply and the upstream sanitation systems.

#### **B. Approach to setting targets and identifying indicators**

9. It is recommended that Parties collect the following information:

(a) Systematic gathering of information on suspected outbreaks from a wide range of formal and informal sources;

(b) Real-time data on the outbreak (e.g. total number of outbreaks, affected persons) of the primary diseases recognized under the Protocol (cholera, bacillary dysentery, EHEC (*Enterohaemorrhagic E. coli* 0157:H7), viral hepatitis A and typhoid fever). If possible, information should also be included on emerging diseases (campylobacteriosis, cryptosporidiosis, giardiasis and legionellosis<sup>9</sup>).

10. In this connection, Parties are invited to take note of the entry into force of the new International Health Regulations (IHR, 2005)<sup>10</sup> and to liaise with national focal points designated under the IHR to ensure consistent reporting.

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<sup>8</sup> Thompson, T. et al, 2007. *Chemical safety of drinking-water: Assessing priorities for risk management*, Geneva, WHO. Available at: [http://whqlibdoc.who.int/publications/2007/9789241546768\\_eng.pdf](http://whqlibdoc.who.int/publications/2007/9789241546768_eng.pdf).

<sup>9</sup> See footnote 2.

<sup>10</sup> For information on IHR (2005), see <http://www.who.int/csr/ihr/en/>.

**C. Common indicators for all Parties which will become part of the reporting mechanism**

11. Real-time data on incidence, prevalence and outbreaks of:

- (a) Cholera;
- (b) Bacillary dysentery (shigellosis);
- (c) EHEC;
- (d) Viral hepatitis A;
- (e) Typhoid fever.

**D. Recommended secondary indicators for all Parties which will in the first instance remain voluntary**

12. Real-time data on the outbreak (e.g. total number of outbreaks, affected persons) of:

- (a) Campylobacteriosis;
- (b) Cryptosporidiosis;
- (c) Giardiasis;
- (d) Legionellosis;
- (e) Acute gastroenteritis of unknown but supposed infectious origin (diagnosis A09 according to ICD-10).

**E. Additional issues that could be the subject of target-setting**

13. According to specific local and national situation, Parties might wish to set targets related to diseases caused by lack of water.

14. Parties might also wish to set targets related to diseases caused by the chemical quality of water, such as blue bay syndrome linked to nitrate exposure, fluorosis linked to fluoride exposure, and various arsenic-related toxic effects linked to arsenic exposure.

**F. Definition**

15. An outbreak of waterborne disease is generally defined as a situation in which at least two people experience a similar illness after exposure to water and the evidence suggests a probable water source. According to article 2 of the Protocol, “water-related disease” means any

significant adverse effects on human health, such as death, disability, illness or disorders, caused directly or indirectly by the condition, or changes in the quantity or quality, of any waters.

#### **G. Relevant regional or global obligations and reporting systems**

16. Currently, information is gathered under three systems:

(a) The Centralized Information System for Infectious Diseases (CISID, <http://data.euro.who.int/cisid/>) uses advanced technology to collect, analyse and present data in the WHO European Region. CISID covers all diseases recognized to be of importance to Parties: cholera, EHEC, viral hepatitis A, typhoid fever and bacillary dysentery/shigellosis. It also covers emerging diseases recognized to be of importance for the Protocol, including campylobacteriosis, cryptosporidiosis, giardiasis and legionellosis. Information gathering under CISID is structured as annual invitations to report, sent out by the WHO Regional Office for Europe.

(b) The Health for All database collects, analyses and presents data on mortality, including mortality from diarrhoeal diseases in the below 5 age group.

(c) Epidemic and Pandemic Alert and Response (EPR) (<http://www.who.int/csr/en/>), a programme of WHO, is an integrated alert and response system for epidemics and other public health emergencies based on strong national public health systems, and is part of an effective international system for coordinated response. At present, EPR covers acute diarrhoeal syndrome and acute watery diarrhoeal syndrome; acute haemorrhagic fever syndrome; cholera; EHEC infection; hepatitis, shigellosis and typhoid fever. It also covers two diseases which were not yet recognized as being of prime importance by the experts from Parties: legionellosis and malaria.

### **IV. ACCESS TO DRINKING WATER (ART. 6, PARA. 2 (c))**

#### **A. Background rationale**

17. Access to drinking water for everyone is among the most important objectives of the Protocol (art. 6, para. 1) and is fully in line with the recognition of water as basic human right by the United Nations. This includes the setting of targets and target dates as to the area of territory, or the population sizes or proportions, which should be served by collective systems for the supply of drinking water or where the supply of drinking water by other means should be improved.

18. The issue of access is not only linked to physical accessibility, but also to economic accessibility (affordability) on the macro and micro levels and to non-discrimination (art. 5, para. 1).

**B. Recommended indicators for all Parties which will become part of the reporting mechanism**

19. Percentage of the population with access to water-supply services defined in accordance with the WHO UNICEF<sup>11</sup> Joint Monitoring Programme (JMP) as the availability of at least 20 litres per person per day from an “improved” source within 1 km of the user’s dwelling. An “improved” source is one that is likely to provide “safe” water, such as a household connection, a borehole, etc.

**C. Additional approaches to setting targets and identifying indicators: options available and non-mandatory indicators**

20. When setting targets and reporting, Parties can decide to differentiate between access to “non-improved” supply (to allow the differentiation between lack of water and having water for hygiene but not for drinking purposes), access to improved water supply and access to safe water supply in accordance with the WHO Guidelines on Drinking-Water Quality or a similar national legal framework.

21. As an example, Hungary has chosen the following approach/targets:

(a) A nationwide survey on the population without access, and exploration of the feasible solutions;

(b) Elaboration of a social subsidising system to implement the human right to water

22. Portugal uses as an indicator for affordability the percentage of the water bill cost compared to the family income. This ratio should not be above 2 per cent.

23. Where relevant, national targets and indicators might also address the issue of decentralized water-supply systems.

**D. Definition**

24. Improved drinking water sources include according to the definition of the JMP: (a) piped water into dwelling; (b) plot or yard; (c) public tap/standpipe; (d) tubewell/borehole; (e) protected dug well; (f) protected spring; and (g) rainwater collection. Unimproved drinking water sources include: (a) unprotected dug well; (b) unprotected spring; (c) cart with small tank/drum; (d) bottled water (only when the household uses water from an improved source for cooking and personal hygiene); (e) tanker-truck; and (f) surface water.

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<sup>11</sup> United Nations Children’s Fund.

### **E. Relevant global and regional obligations and reporting systems**

25. The JMP<sup>12</sup> monitors the proportion of the population with access to safe drinking water expressed as the percentage of people using improved drinking water sources or delivery points. The JMP is the officially designated monitoring programme by which progress to the Millennium Development Goals is being assessed. However, JMP neither includes the daily availability of water at home nor the quality of the delivered water.

26. Additional information is also available from other sources, e.g. Eurostat and the Organisation for Economic Co-operation and Development (OECD).

## **V. ACCESS TO SANITATION (ART. 6, PARA. 2 (d))**

### **A. Background rationale**

27. Provision of sanitation to everyone is among the most important objectives of the Protocol (art. 6, para. 1). Article 6, paragraph 2 (d) requires the setting of targets and target dates related to the area of territory, or the population sizes or proportions, which should be served by collective systems of sanitation or where sanitation by other means should be improved. Advancement in this area is particularly important in 2008, which has been designated by the United Nations General Assembly as the International Year of Sanitation to highlight the need for reinvigorated actions by Governments to meet Millennium Development Goal 7, Target 10.

### **B. Common indicators for all Parties which will become part of the reporting mechanism**

28. Common indicators for all Parties to the Protocol are the percentage of the population with access to improved sanitation, including small decentralized sewerage systems, and also septic and safe excreta disposal.

### **C. Additional approached to setting targets and identifying indicators: options available and non-mandatory indicators**

29. In addition, Parties might set targets and report on the percentage of the population served by sewerage connections and wastewater treatment plants and might make a distinction between primary, secondary and tertiary wastewater treatment plants.

30. Moreover, Parties might wish to set targets related to decentralized systems for small settlements and on site sanitation.

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<sup>12</sup> Information on JMP is available at: <http://www.wssinfo.org/en/welcome.html>.

#### **D. Definition**

31. According to the Protocol, article 2 (“Sanitation”) means the collection, transport, treatment and disposal or reuse of human excreta or domestic wastewater, whether through collective systems or by installations serving a single household or undertaking.

#### **E. Relevant global and regional obligations and reporting systems**

32. The JMP collects data on access to improved sanitation facilities defined as connections to a public sewer, connection to a septic tank, flush or pour-flush to piped sewer system, septic tank, or pit latrine, ventilated improved pit latrine, pit latrine with slab, or composting toilet. Unimproved sanitation includes flush or pour-flush to elsewhere (street, yard or plot, open sewer, ditch, drainage way or other location); pit latrine without slab or open pit; bucket; hanging toilet or hanging latrine; and no facilities or bush or field.

33. According to the Urban Wastewater Treatment Directive 91/271/EC, all settlements with over 2,000 inhabitants need to have a proper collection and treatment system. The Urban Wastewater Directive also requires EU Member States to ensure that every two years the relevant authorities publish situation reports on the disposal of urban wastewater and sludges in their areas.

34. Additional database and reporting systems on access to sanitation include the European Environment and Health Information System (ENHIS)<sup>13</sup> Joint Eurostat/OECD questionnaire, the Health for All Database and EIONET (EEA WATERBASE).

### **VI. LEVELS OF PERFORMANCE OF COLLECTIVE SYSTEMS AND OTHER SYSTEMS FOR WATER SUPPLY (ART. 6, PARA. 2 (e))**

#### **A. Background rationale**

35. Article 6, paragraph 2 (e), of the Protocol requires the setting of targets and target dates related to the levels of performance to be achieved by collective systems and by other means of water supply and sanitation.

#### **B. Approach to setting targets and identifying indicators: options available and non-mandatory indicators**

36. Possible indicators include:

(a) Average continuity of supply (number of hours when the system is pressurized per day);

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<sup>13</sup> See <http://www.enhis.org/>.

- (b) Rate of failure to comply with legally required residual chlorine at point of consumption (in countries with mandatory chlorination only) in percentage;
- (c) Main failures (number of mains failures during the assessment period, including failures of valves and fittings/km/year);
- (d) Water losses per connection ( $\text{m}^3/\text{connection}/\text{year}$  or in %) - physical losses
- (e) Efficiency, sustainability and affordability criteria of the water utility: e.g. standardised energy consumption  $\text{mWh}/\text{m}^3$  of water produced/distributed, with the indicator related to the water price;
- (f) Percentage of water produced by certified (e.g. ISO<sup>14</sup>) suppliers;
- (g) A social accessibility indicator, e.g. comparing the cost for water with the income of the family.

## **VII. LEVELS OF PERFORMANCE OF COLLECTIVE SYSTEMS AND OTHER SYSTEMS FOR ... SANITATION (ART. 6 (2) (e) cont'd)**

### **A. Background rationale**

37. Indicators for the level of performance of collective systems for “sanitation” need to include indicators for the collection, transport, treatment and disposal or reuse of human excreta or domestic wastewater, whether through collective systems or by installations serving a single household or undertaking. (art 2, para. 9).

38. To facilitate the collection of information, a similar approach to the one for water supply could be used.

### **B. Approach to setting targets and identifying indicators: options available and non-mandatory indicators**

39. Possible indicators include:

- (a) Pump failures (hours/total hours/ number of events; for suppliers of sanitation, and wastewater);
- (b) Wastewater sewers blocking (number of wastewater sewers blocking/100 km/year);

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<sup>14</sup> International Organization for Standardization.

(c) Efficiency, e.g. carbon efficiency of the wastewater treatment utility, energy use per m<sup>3</sup> treated per year, indicator related to the price of the treatment;

(d) Sustainability of the operator under an economic, environmental, technical, financial, operational and human resources point of view;

(e) National legislation may impose certain performance benchmarks as a precondition for granting an operational license. Parties may wish to report the compliance rate with such an operational benchmark as attested by the national regulator;

(f) The number of complaints received by national authorities may in itself constitute a valid indicator on perceived utility performance.

### **C. Relevant regional or global obligations and reporting systems**

40. The Programme for the Assessment and Control of Marine Pollution in the Mediterranean Region (MED POL), the scientific and technical component of Mediterranean Action Plan established under the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention), is responsible for the implementation of the Land-Based Sources, Dumping and Hazardous Wastes Protocols.<sup>15</sup> It publishes guidelines on sewage treatment and disposal and monitors the application of these guidelines throughout the Mediterranean region.<sup>16</sup> At present, MED POL assesses sewerage and performance of sewage systems in all Mediterranean cities with populations of more than 2,000 inhabitants.

## **VIII. APPLICATION OF RECOGNIZED GOOD PRACTICES TO THE MANAGEMENT OF WATER SUPPLY (ART. 6, PARA. 2 (f))**

### **A. Background Rationale**

41. Article 6, paragraph 2 (f), of the Protocol requires the setting of targets and target dates related to the application of recognized good practices in the management of water supply and sanitation. Thus, emphasis is put on good but not necessarily the best practices, which have to be adapted to the local circumstances (not necessarily internationally recognized) and to implementation. This is rather a descriptive than a quantitative indicator.

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<sup>15</sup> The Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities, the Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea, and the Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal.

<sup>16</sup> See for example United Nations Environment Programme, 2004, Guidelines on Sewage Treatment and Disposal for the Mediterranean Region.

**B. Approach to setting targets and identifying indicators: options available and non-mandatory indicators**

42. Recognizing that a purely parametric compliance verification would create a significant workload and considerable financial expenses, WHO reconsidered the basic approach in the Guidelines for Drinking-Water Quality, and recognized that the most effective means of consistently ensuring the safety of a drinking-water supply is through the use of an approach incorporating comprehensive risk assessment and risk management. Such an approach is termed a water safety plan.

43. A survey undertaken by the WHO Regional Office for Europe in cooperation with the European Commission demonstrated that in many countries water safety plans or elements thereof are already being applied. A possible approach could therefore be to select indicators which would highlight the move towards full water safety plans throughout the water utility.

**C. Approach to setting targets and identifying indicators: options available in growing order of ambition and non-mandatory indicators**

44. Possible indicators include:

(a) Percentage of utilities with approved protection zones, or with advanced water treatment to compensate for lack of protection, weighted by volume or population size, established as a component of an integrated water resource management plan;

(b) Percentage of utilities with a certification to universally accepted standards which are independently verified, such as the ISO 9000 or ISO 14000, weighted by volume of water produced or population size served;

(c) Percentage of utilities with a certification of components to universal standards, for example laboratory accreditation by national accreditation bodies, weighted by volume or population size;

(d) Percentage of water utilities that are implementing an independently verified water safety plan or ISO 22000 certification.

45. Another approach could be based on compliance with the licensing of the water abstractions, namely regarding the existence of approved protection zones (m<sup>3</sup>)/total water abstraction (m<sup>3</sup>).

**IX. APPLICATION OF RECOGNIZED GOOD PRACTICE TO THE  
MANAGEMENT OF SANITATION (ART. 6, PARA. 2 (f)) (continued)**

**A. Approach to setting targets and identifying indicators: options available and  
non-mandatory indicators**

46. Although the situation with sanitation utilities is somewhat different from the situation with water utilities, common practice between different operators does allow the formulation of a number of suggestions at the level of the individual utility, as well as on a local or national basis.

*Possible indicators at the level of the individual utility*

47. Performance of individual utilities might consider the following aspects:

(a) The annual mean removal percentages of indicative parameters (e.g. biochemical oxygen demand (BOD), chemical oxygen demand (COD), suspended solids, total nitrogen, total phosphorous);

(b) The daily quality standard for the effluent of the wastewater treatment plant and, the number of non-compliance cases of such parameter per year.

48. This approach would allow countries to report that in the year XXXX, AAA wastewater treatment plants met all emission standards, while BBB treatment plants failed to meet the standard for ZZZ (e.g. nitrogen) in YYY per cent of cases.

49. In addition, sludge production and sludge treatment (drying beds, mechanical dewatering, incineration in tons per year per treatment method) could be considered.

*Possible indicators at the level of the river basin or country*

50. Possible indicators include:

(a) Number of wastewater treatment plants existing and planned load (population equivalent/year);

(b) Number of wastewater treatment plants operational and planned load (population equivalent/year);

(c) Number of wastewater treatment plants operational and slated for performance upgrade;

(d) Number of wastewater treatment plants existing, but not functioning (population equivalent/year);

(e) Number of planned wastewater treatment plants, planned load, and planned year of start-up.

## **X. OCCURRENCE OF DISCHARGES OF UNTREATED WASTEWATER (ART. 6, PARA. 2(g) (i))**

### **A. Background rationale**

51. Article 6, paragraph 2 (g), of the Protocol requires the setting of targets and target dates related to the occurrence of discharges of untreated wastewater. Access to sanitation is covered above under target 6, 2, (d); thus, this target concentrates on the (non-)treatment of wastewater. This indicator concerns the divergence of sewage collection and treatment which may be caused by unbalanced development strategies. Although the priority of primary sanitation (sewerage) in urbanized areas is reasonable, the discrepancy can harshly impact the water environment and will directly or indirectly endanger human health.

### **B. Approach to setting targets and identifying indicators: options available and non-mandatory indicators**

52. A possible indicator is the percentage of untreated wastewater (total volume of untreated wastewater / total volume of wastewater). However, difficulties may be expected with both the availability of data (quantity of untreated wastewater is not generally gauged) and the appraisal of it if the storm water overflows are not considered separately.

53. In line with the EU regulations, it may be sensible to define wastewater treatment-related – and storm water overflow-related – indicators separately for normal and sensitive areas where the definition of sensitivity should be driven by the hazard of eutrophication and/or bathing and recreational use of the receiving waters. This is also an issue of transboundary water management covered by the Protocol.

### **C. Definition**

54. A review of definitions of wastewater treatment plants, their advantages and disadvantages can be found in WHO/UNEP/FAO<sup>17</sup> Guidelines for the Safe Use of Wastewater, Excreta and Greywater.<sup>18</sup>

### **D. Relevant regional or global obligations and reporting systems**

55. States from the European Economic Area and candidate countries should report every two years to Eurostat, data is differentiated into primary, secondary and tertiary treatment;

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<sup>17</sup> Food and Agriculture Organization of the United Nations.

<sup>18</sup> See Volume II: Wastewater Use in Agriculture, pp. 82, table 5.3.

56. According to the Urban Wastewater Treatment Directive 91/271/EC, all settlements with more than 2,000 inhabitants must have a proper treatment and collection system by 2005 in the EU-15 and by 2015 in the new EU Member States.

#### **E. Pending issues**

57. The identified options for indicators do not reflect a risk management approach.

### **XI. OCCURRENCE OF DISCHARGES OF UNTREATED STORM WATER OVERFLOWS FROM WASTEWATER COLLECTION SYSTEMS TO WATERS WITHIN THE SCOPE OF THE PROTOCOL (ART. 6, PARA. 2 (g) (ii))**

#### **A. Background rationale**

58. The second part of article 6, paragraph 2 (g), of the Protocol requires the setting of targets and target dates related to occurrence of discharges of untreated storm water overflows from waste-water collection systems to waters within the scope of the Protocol. Storm water overflow represents a significant risk, but is not addressed in detail in European Commission or international legislation and the indicators used for the assessment of wastewater treatment coverage only concern the population (or population equivalent) served. Separated storm drain systems are the best way to deal with storm water, but since many countries have already combined systems for normal sewage and storm water upgrading all of these would be very expensive. Thus, other appropriate measures against storm water could be taken by countries such as construction of storage facilities for the excess drainage to settle. Appropriate targets might be set with regard to development by constructing only divided precipitation drainage systems, sufficient storage capacities, or for a combination of the two.

#### **B. Approach to setting targets and identifying indicators: options available and non-mandatory indicators**

59. Possible indicators include:

(a) Percentage of outputs of combined systems in comparison to all sewerage systems. This approach has the difficulty of data missing on the shunt drain output during excessive flows. Therefore either dry weather outputs or person-related coverage should be compared;

(b) Number of combined sewer overflows;

(c) Existence of storing/holding facilities for storm water;

(d) Capacity of the sewage treatment plants in relation to dry weather flow;

(e) Total number of overflows per year;

(f) New construction of only separate sewer systems and transformation of old combined systems into separate ones (in terms of treatment capacity or persons covered).

**C. Relevant regional or global obligations and reporting systems**

60. According to the EU Wastewater Directive 91/271/EEC, “Member States shall decide on measures to limit pollution from storm water overflows. Such measures could be based on dilution rates or capacity in relation to dry weather flow, or could specify a certain acceptable number of overflows per year”.

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