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WORLD HEALTH
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GUIDELINES ON THE SETTING OF TARGETS, EVALUATION OF PROGRESS AND REPORTING

Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes

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WORLD HEALTH ORGANIZATION
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FOREWORD

Pressures on water resources affect human health, economic development and the environment at large. In the pan-European region, industrialization, intensification of agriculture, urbanization, increased recreational water demands, conflicts between uses and users and more frequent and more devastating extreme weather events, as well as the anticipated negative impacts of climate change, heighten the need for sustainable management of water resources. Access to safe drinking water and sanitation for every one is far from being achieved; recent data show an alarming stagnation of progress towards access to sanitation, especially in the eastern part of the region. Moreover, mortality and morbidity caused by unsafe water and inadequate sanitation remain unacceptably high. According to the estimates of the World Health Organization, more than 13,000 children under the age of 14 die every year in the region from water related diarrhoea, mostly in Eastern Europe and Central Asia. Moreover, disparities between countries, between rural and urban populations and between different socio-economic groups are broad.

The bottlenecks in addressing these problems often occur beyond the purview of the water and health sectors. They lie in the formulation and implementation of policies; the effectiveness of institutions and the arrangements between them; the translation of political will into action; the allocation of resources at national and international level; and in the capacity of countries.

The Protocol on Water and Health, jointly serviced by the United Nations Economic Commission for Europe (UNECE) and the Regional Office for Europe of the World Health Organization (WHO-EURO), has been negotiated specifically to ensure, by linking water management and health issues, the supply of safe drinking water and adequate sanitation for everyone. Its main aim is to protect human health and well-being through preventing, controlling and reducing water-related diseases and through improving water management.

The Protocol recognizes the complexity of the water and health nexus and requires Parties to tackle problems at their roots in a rational and coordinated way. It compels Parties to set national and/or local targets and the dates to achieve them in areas covering the entire water cycle and the related health consequences, to develop measures to achieve such targets and to regularly assess progress. Setting targets and review and assessment of progress, as defined in Articles 6 and 7 of the Protocol, are the backbone for action to reach the Protocol's objectives.

The very process of setting targets brings benefits beyond their stated purpose. It creates a platform for cooperation between various stakeholders and different levels of government, as well as for the development of concerted national actions. It also provides a framework to analyse national situations and to streamline and harmonize responsibilities and commitments in the areas of water and health. It offers a step-by-step approach to achieving goals and guides authorities in the allocation of resources. Target setting becomes the basis for realistic plans with prioritized time-bound objectives adapted to national situations. Setting targets is also a useful tool in complying with other international commitments, in particular the Millennium Development Goals and European Union legislation.

Clearly this is a complex and challenging process, but Parties are not alone in this difficult endeavour. A comprehensive framework for mutual assistance between Parties has been established under the Protocol which includes the provision of policy and technical guidance and of technical and financial assistance, mostly through the Project Facilitation Mechanism, as well as assistance in capacity-building and exchange of experience.

The *Guidelines on the Setting of Targets, Evaluation of Progress and Reporting* are a building-block of this mutual assistance framework, its theoretical and practical foundation. The Guidelines illustrate the steps that need to be taken and the aspects to be considered when setting targets, implementing relevant measures and assessing and reporting on the progress achieved. The Guidelines are based on existing good practices and experience of the Protocol's Parties. They illustrate a variety of possible targets that can be set in accordance with the Protocol and provide a source of inspiration, information and assistance to Parties that are currently undergoing or will go through the process of target setting.

We trust that these Guidelines will serve as a useful and stimulating tool in the hands of national and local authorities and all other stakeholders engaged in the implementation of the Protocol. The joint UNECE/WHO-EURO secretariat will continue to support countries in their efforts to protect human health and well-being and to manage water resources in a sustainable manner.

Ján Kubiš
Executive Secretary
United Nations Economic Commission for Europe

Zsuzsanna Jakab
Regional Director
World Health Organization
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PREFACE

It gives me great pleasure to introduce the *Guidelines on the Setting of Targets, Evaluation of Progress and Reporting*, which are a major undertaking of the Task Force on Indicators and Reporting under the Protocol on Water and Health.

The Protocol represents a major step forward in the protection of human health through improved water management. It is unique among multilateral environmental agreements in the extent to which its objectives cross-cut environmental protection and human well-being: it offers a holistic framework for addressing the whole chain of cause and effect, from environmental degradation to water-related health effects.

The main operational provisions are contained in its Articles 6 and 7 which — together with the requirements to establish response systems for water-related disease contained in Article 8 — are the foundation of the Protocol's implementation.

Articles 6 and 7 require Parties, within two years of becoming a Party, to set firm targets in areas covering the entire water cycle, as well as dates by which they will achieve such targets. Targets should address issues related to the quality of drinking and bathing water; problems related to water supply, sanitation and wastewater; the reduction of water-related disease; the management of water resources; the control and clean-up of pollution; and the availability of information to the public. Parties must regularly assess progress made towards reaching these targets and demonstrate if such progress has helped to prevent, control or reduce water-related disease. Moreover, Parties have to publish the results of that assessment and have to report every three years to the Meeting of the Parties on implementation and progress achieved.

Parties to the Protocol recognized the significant challenges connected with setting targets and reviewing and assessing progress and, at their first meeting in January 2007 in Geneva, decided to develop the present Guidelines to support work in these areas.

The preparation of the Guidelines relied on a broad consultative process, involving national authorities, academia, non-governmental and international organizations. A multidisciplinary drafting group was decisive in their elaboration. The drafting was also informed by two workshops focusing on target setting and on reporting, held in Geneva in February 2009 and February 2010. Parties, non-Parties, and other actors were repeatedly consulted and provided not only comments but also practical examples, direct experiences and lessons learned.

The Guidelines are intended for those responsible at the national and local levels for the Protocol's implementation and in particular for setting targets and target dates, designing and implementing programmes of measures and reviewing and reporting on progress.

The Guidelines do not enter into the technical details of all the issues related to the implementation of the Protocol, but rather seek to provide a strategic framework for the target-setting process. As targets need to be tailored to Parties' needs and capacities from the health, environmental, social and economic points of view, the Guidelines provide an analytical and strategic basis to design and agree on the most appropriate targets and on the ways and means to achieve them.

Experience in setting targets in accordance with the Protocol is still limited and more efforts are needed to ensure proper implementation of the Protocol throughout the region and to attain access to safe drinking water and adequate sanitation for everyone. It is my sincere hope that the Guidelines will stimulate Parties to speed up their target-setting process. Exchanging experience through international and national workshops, projects and other activities under the Protocol will be crucial for complementing these Guidelines and for supporting Parties in realizing the objectives of the Protocol.

Pierre Studer

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Confederaziun svizra

Swiss Confederation

Federal Department of Home Affairs FDHA
Federal Office of Public Health FOPH

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LIST OF ACRONYMS AND ABBREVIATIONS

BOD	Biochemical Oxygen Demand
CISID	Centralized Information System for Infectious Diseases
COD	Chemical Oxygen Demand
EC	European Commission
EEA	European Environment Agency
EHEC	Enterohemorrhagic E. coli
ENHIS	Environment and Health Information System
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
GIS	Geographic Information System
ISO	International Organization for Standardization
IWRM	Integrated water resources management
JMP	Joint Monitoring Programme
MDGs	Millennium Development Goals
MED POL	Programme for the Assessment and Control of Marine Pollution in the Mediterranean Region
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
PES	Payment for ecosystem services
Protocol	Protocol on Water and Health
RADWQ	Rapid Assessment of Drinking Water Quality
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
Water Convention	Convention on the Protection and Use of Transboundary Watercourses and International Lakes
WFD	Water Framework Directive (of the European Union)
WHO	World Health Organization
WSP	Water safety plan

INTRODUCTION

The Protocol on Water and Health to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) requires Parties to establish and publish national and/or local targets for the standards and levels of performance that need to be achieved or maintained for a high level of protection of human health and well-being, as well as for the sustainable management of water resources. Paragraph 2 (a) to (n) of article 6 of the Protocol identifies the general areas within which the targets should be set (box 1). Furthermore, according to article 7, Parties shall collect and evaluate data on their progress towards the achievement of the targets and on indicators designed to show how far that progress has contributed towards preventing, controlling or reducing water-related disease.

Box 1. Areas in which target setting is required by article 6 of the Protocol

(a) The quality of the drinking water supplied

(b) The reduction of the scale of outbreaks and incidents of water-related disease

(c) 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

(d) 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

(e) The levels of performance to be achieved by such collective systems and by such other means of water supply and sanitation, respectively

(f) The application of recognized good practice to the management of water supply and sanitation, including the protection of waters used as sources for drinking water

(g) The occurrence of discharges of:

(i) Untreated wastewater from wastewater collection systems to waters within the scope of the Protocol

(ii) Untreated storm water overflows from wastewater collection systems to waters within the scope of the Protocol

(h) The quality of discharges of wastewater from wastewater treatment installations to waters within the scope of the Protocol

(i) The disposal or reuse of sewage sludge from collective systems of sanitation or other sanitation installations and the quality of wastewater used for irrigation purposes, taking into account the Guidelines for the safe use of wastewater and excreta in agriculture and aquaculture of the World Health Organization and the United Nations Environment Programme

(j) The quality of waters which are used as sources for drinking water, which are generally used for bathing or which are used for aquaculture or for the production or harvesting of shellfish

(k) The application of recognized good practice to the management of enclosed waters generally available for bathing

(l) The identification and remediation of particularly contaminated sites which adversely affect waters within the scope of the Protocol or are likely to do so and which thus threaten to give rise to water-related disease

(m) The effectiveness of systems for the management, development, protection and use of water resources, including the application of recognized good practice to the control of pollution from sources of all kinds

(n) The frequency of the publication of information on the quality of the drinking water supplied and of other waters relevant to the targets set out in paragraph 6 of the Protocol in the intervals between the publications of information as set out under article 7, paragraph 2 of the Protocol

A. OBJECTIVES AND TARGET GROUPS

The main objective of these Guidelines is to facilitate the implementation of the Protocol on Water and Health. In particular, the Guidelines illustrate the steps that need to be taken and aspects that should be considered when setting targets, implementing relevant measures and reporting on the progress achieved with respect to protecting human health and well-being and the sustainable management of water resources, in accordance with articles 6 and 7 of the Protocol.

Moreover, the Guidelines offer some practical examples based on Parties' experience, illustrate a variety of possible targets that can be set in accordance with the Protocol and provide a source of inspiration, information and assistance for Parties that are currently undergoing or are planning to initiate the process of target setting.

When following the general framework proposed by these Guidelines, Parties need to be aware that, to be effective, the framework always needs to be adjusted to the specific circumstances of the national and/or local context.

The Guidelines are intended for those responsible at the national and local levels for setting targets and target dates. The Guidelines do not enter into the technical details of all the issues related to the implementation of the Protocol, but rather seek to provide a strategic framework for the target-setting process.

B. BACKGROUND RATIONALE

Problems related to management of water resources, water supply, sanitation and health are scattered across different policy sectors and call for close cooperation among various authorities at the policy as well as the management levels. Setting national targets under the Protocol creates a platform for discussion and promotes coherence, harmonization and integration between different sectors, bringing together different stakeholders (such as governmental and non-governmental organizations (NGOs), the scientific community, the private sector and the general public). The process of target setting also provides a vertical communication channel between different levels of administration (from local to national) and helps translate national targets into the local context.

The target-setting process offers a framework to analyse the national situation and to streamline and harmonize responsibilities and commitments in the areas of water and health. Based on this analysis, a realistic plan for improvement with prioritized time-bound targets adapted to the national situation can be elaborated.

By setting targets, Parties are encouraged to tailor their responses to their country-specific problems and to take a holistic approach to address them. The process of setting targets helps focus attention on the services and actions needed, including communications to stakeholders and the general public about the expected outcomes and results.

Clearly defined national targets can be used by national and local authorities as a basis for the allocation of resources. Clearly established and politically endorsed targets can also be a sound basis for requests for international assistance, enhancing possibilities of access to international funding.

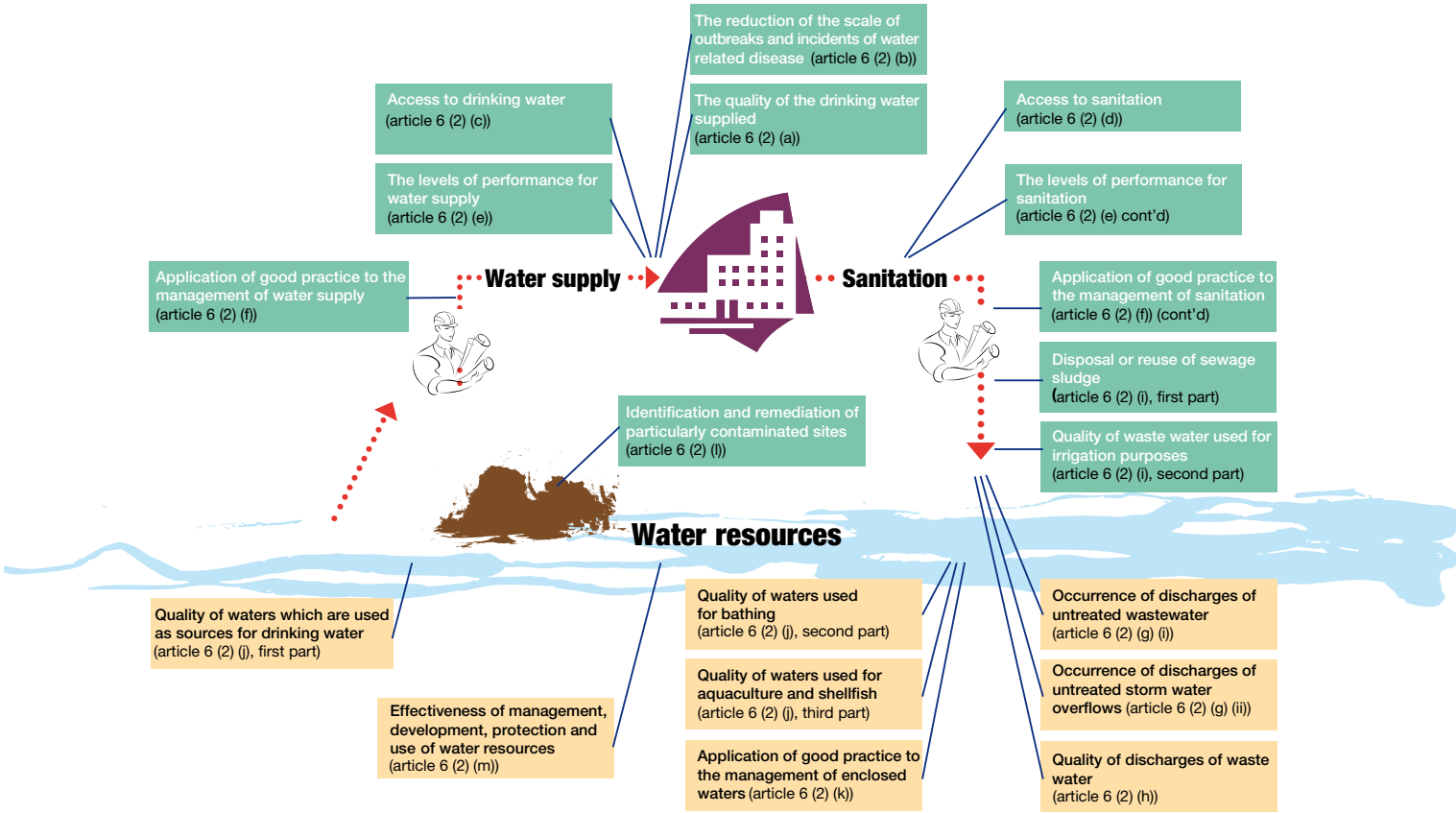
In particular, the Project Facilitation Mechanism, established under the Protocol to facilitate coordination and assistance as required by article 15, provides a useful framework for countries to request support in setting their targets and target dates and in successfully implementing activities to reach them.

Implementation of the Protocol, and in particular target setting, can be a useful tool to support implementation and compliance of international obligations. Parties should see the Protocol within the broad framework of the other international commitments closely related to it. The Annex provides a (non-comprehensive) list of relevant international instruments.

In particular, for European Union (EU) countries, the implementation of the Protocol and of the EU Directives and regulations can be mutually supportive. Setting targets can be a tool to pursue compliance with EU Directives. Moreover, setting targets can allow progress in subject areas that are not regulated by the EU, in accordance with national priorities and the resources available.

Ultimately, by presenting environment and health information in a more integrated manner, the process of target setting will allow for a better understanding of the water and health nexus and the cause-consequence chain. It can thus contribute to reversing the present situation in which inadequate policies, planning or management practices may have conflicting objectives and approaches, sometimes resulting in restricted access to safe drinking water and sanitation, as well as serious threats to human health and the environment.

Figure 1. Relationship between the water cycle and areas under article 6



The Guidelines are composed of the following parts:

(a) Part one: the main steps for setting targets, reviewing progress and reporting;

(b) Part two: options for setting targets and indicators under article 6, paragraph 2 (a) to (n).

PART ONE

MAIN STEPS FOR SETTING TARGETS, REVIEWING PROGRESS AND REPORTING

I. KEY ISSUES TO BE CONSIDERED WHEN SETTING TARGETS UNDER THE PROTOCOL ON WATER AND HEALTH

The targets for the standards and the level of performance that need to be achieved or maintained shall be established and published at the national and/or local levels. Except where national or local circumstances make them irrelevant for human health and sustainable water management, the targets shall cover the areas described under the article 6, paragraphs 2 (a) to (n), of the Protocol.

Moreover, depending on the specific circumstances, Parties might wish to set targets in areas that are not listed in article 6 of the Protocol, in order to address their national and/or local problems.

As the situations among Parties to the Protocol vary for each country, the nature and level of ambition in target setting under each specific area may also be very different. The objective of target setting and reporting is not to compare Parties with each other, but to assist Parties in developing integrated national strategies on water and health, a road map for their implementation and the means to measure progress achieved, as well as giving them the possibility to learn from each other.

Targets should be tailored to Parties' needs and capacities from the health, environmental, social and economic points of view. Although article 6 of the Protocol clearly indicates the specific thematic areas for which targets should be set, it does not impose any common targets for the Parties to the Protocol. When doing its baseline and gap analysis, each Party needs to analyse its specific national and local conditions, its main problems related to the water and health nexus and the resources available. Targets and target dates need to be set in accordance with such an analysis.

However, for the sake of regional harmonization, Parties have decided to make use of commonly agreed indicators for consistent reporting under the Protocol.

In setting targets, Parties should strive for comprehensiveness. Developing an integrated understanding of water, environment and health issues is the main objective of the Protocol and its greatest added value.

When setting targets and target dates, Parties should be guided by the principles and approaches of article 5 of the Protocol.

When choosing their targets, Parties should take into account sustainability as well as economic aspects (such as cost-benefit analysis).

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.

At the same time, Parties should take into account the fact that progress in one area is closely related to progress in others. For instance, to maximize prevention of water-related disease, Parties will at the same time need to work on access to safe water, improved sanitation and hygiene standards. Thus, the combination of targets set should be coherent and targets set in different areas should support each other in achieving the overall goals of the Protocol.

Target setting, evaluating and reporting should be seen as an iterative process that takes into account new information as it becomes available. A main advantage of iterative target setting is the possibility of adopting a step-wise approach, allowing for incremental improvement.

Depending on the country situation, the scope and scale of targets under each specific area may vary significantly. Targets may focus on the regulatory level (e.g., development and/or implementation of new water and health regulations or better enforcement of existing regulations), on the establishment or enhancement of available information (e.g., improved inventory systems) or on practical measures (e.g., development of river basin management plans, construction of wastewater treatment plants and enhancement of the network of laboratories).

Targets can be set at the national and/or local levels. When national targets are set, special attention is necessary to ensure that they are properly reflected at the local level and that they encompass the areas with the main problems.

In the case of transboundary waters, targets at the national and local levels should also take into account the transboundary dimension. This implies that targets at the level of river basins should be discussed and agreed upon between riparian countries and that national and local targets should take such transboundary objectives into account.

When setting targets, Parties should take into account climate change and its impacts on the whole water cycle (see table 1). The process of setting targets offers a good opportunity for identification of potential risks related to the changing environment. Moreover, the process of setting targets could provide the basis for the introduction of long-term objectives and adequate adaptation strategies. The Protocol's provisions and its flexibility make it a great tool to use for addressing emerging issues related to climate change.

Table 1. Climate change impact on water within the scope of the Protocol

Natural event	Impact	Protocol Provisions
Increased temperature	▪ Lower oxygen concentration, hence lower self-purification capacity of surface water. ▪ Longer algal season and earlier bloom. ▪ Penetration of toxic (tropic or semi-tropic) opportunistic invaders in virgin ecosystems. ▪ Impact on survival of micro-organisms in drinking water distribution systems.	▪ Quality of drinking water to conform to the World Health Organization (WHO) Guidelines for Drinking Water Quality (6.2.a).
Changing hydraulic regimes	▪ Floods challenge storm water overflows, treatment systems and continued operation of water supply and sanitation systems. ▪ Droughts especially in the Mediterranean and Central Asia cause: - Increased concentrations of pollution requiring better treatment options and better protection; - Lack of water for different purposes This can be addressed through: - Improved implementation of integrated water resources management (IWRM); - Better protection and sustainable exploitation of groundwater resources.	▪ Discharges of untreated storm water overflows (6.2.g.). ▪ Protection of water used as source of drinking water (6.2.a. and c.; 6.2.f.). ▪ Quality of discharge from wastewater treatment plants (6.2.h.). ▪ Reuse of wastewater treatment sludge in accordance with WHO and United Nations Environment Programme (UNEP) Guidelines (6.2.i.) ▪ Quality of waters used for drinking water (6.2.j.).
Secondary impacts of quality change	▪ Higher temperatures and decreasing freshwater quality can lead to: - A decrease in the quality of recipient recreational waters; - Proliferation of toxic micro-organisms can influence the quality of the food chain, particularly aquaculture.	▪ Quality of waters generally used for bathing or aquaculture or the cultivation of shellfish (6.2.j.).
Secondary impacts of changed ecosystems	Improved breeding grounds for disease carrying vectors.	Art. 8: Outbreak detection, contingency and response systems.
Health	Immediate impact of flooding, heat waves, etc.: - Outbreak of waterborne diseases; - Outbreak of vectorborne diseases.	Art. 8: Outbreak detection, contingency and response systems.

The Protocol encourages Parties to set targets at the national and local levels. No real progress can be achieved under the Protocol without actions at the local level, thus the national and local activities on setting targets should be intertwined, where the local targets would contribute to achieving the national ones and vice versa. The existing structures at the basin and sub-basin levels should be used for establishing a dialogue with all relevant stakeholders.

In target setting, Parties should take into account that all targets need to be assessable either by quantitative or qualitative indicators. According to article 7 of the Protocol, Parties shall collect data that allow a meaningful evaluation of progress towards the achievement of targets. Based on this collection and progress evaluation, Parties are required to provide a summary report to the secretariat and for circulation among other Parties that assesses the progress achieved.

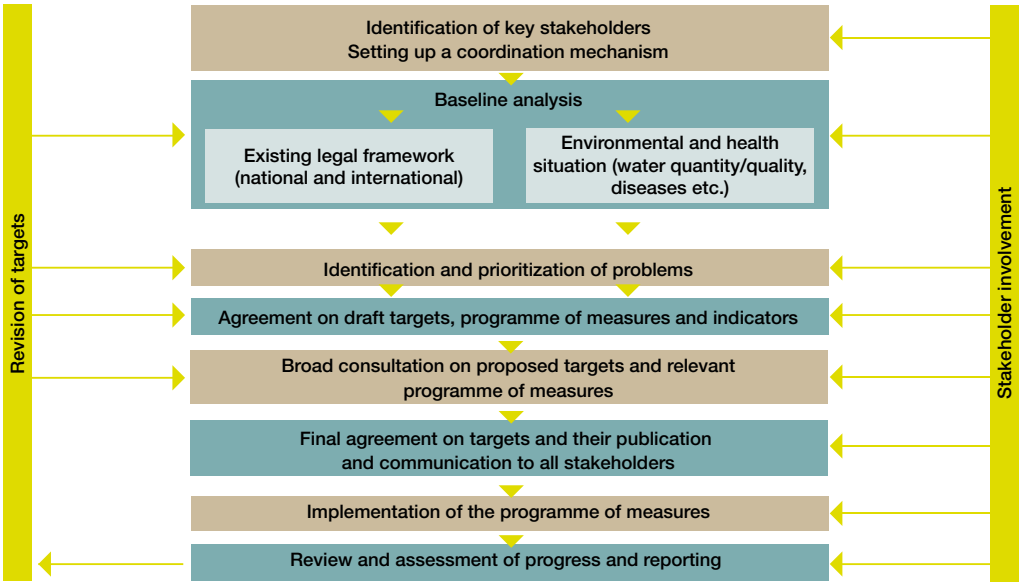
As target setting and reporting are among the main obligations under the Protocol, they are subject to review of compliance in accordance with the Protocol's article 15. When setting targets, Parties should thus carefully assess their "achievability" and the measures needed to reach the targets.

When selecting targets and indicators, Parties need to take into account existing legal obligations, monitoring systems and international and national reporting systems.

II. SETTING TARGETS

The way Parties conduct the process of setting targets will to a large extent depend on specific national/local conditions; however, there are some general steps that should be considered by all Parties when setting targets and implementing relevant measures. Figure 2 below illustrates the overall framework of the process.

Figure 2. Logical framework for the process of setting targets



A. Identification of key stakeholders and setting up of a coordination mechanism

In accordance with article 6, paragraph 5 (a), Parties to the Protocol shall establish national or local arrangements for coordination between their competent authorities in order to set targets. The process of target setting should be led by the main competent authority(ies) (e.g., depending on national setting, the Ministry of Health and/or Environment), in close cooperation with other concerned stakeholders responsible for the overall implementation of the Protocol.

The main stakeholders and key players concerned with implementation of the Protocol should be identified. These include: (a) ministries; (b) national, federal, provincial and local (both urban and rural) authorities; (c) existing working groups/committees concerned with water and health issues; (d) associations and organizations of public or private service providers (e.g., water and sanitation suppliers, wastewater removers); (e) research institutes; (e) academia and professional associations in the areas of health, environment and water; and (f) representatives of finance, tourism, agriculture, the economy or development as well as representatives of the public (e.g., through consumer associations or NGOs). Some stakeholder groups may not be easily involved as their organizational structures are unknown or non-existent (e.g., small drinking water suppliers or private well owners). Thus, additional efforts should be made to involve them in the process.

The activities related to the overall implementation of the Protocol are often conducted by a large number of national agencies under different ministries. In many countries a triggering of the decision-making process of setting targets needs to occur at the highest governmental level, e.g., the cabinet of the Prime Minister. Moreover, in order to maintain the political support and secure funding, Parties should strive to involve the Ministry of Foreign Affairs and the Ministry of Finance or the Economy.

The stakeholders and key players should be presented with the Protocol's provisions in order to create a common understanding. It needs to be made clear to all involved that the Protocol is a legally binding instrument.

In order to bring together all stakeholders concerned in the process of target setting and to create an appropriate coordination mechanism, depending on the country's institutional set-up, either use could be made of existing structures and networks or a specific, inter-ministerial committee/working group could be established.

The coordination mechanism responsible for target setting and its composition might need to be expanded during the process, for instance if it becomes clear that additional expertise is required or that some stakeholders have not been included.

The following aspects need to be considered when creating the coordination mechanism:

(a) The terms of reference of the coordination mechanism, its mandate and the distribution of responsibilities should be clearly defined;

(b) The composition of the coordination mechanism should cover all expertise needed in the target-setting process and should in particular aim at involving representatives of the Ministry of Finance, the Ministry of Foreign Affairs or Development as well as high-level representation (e.g., from the cabinet of the Prime Minister). The committee/working group should also include representatives of key stakeholders (see above);

(c) Specific sub-groups might be established (e.g., for bathing, economic issues, agriculture and water protection issues);

(d) When initiating the setting of targets, Parties should be aware that it is a long process that can take up to several years. Therefore, to ensure continuous progress in complying with the Protocol and setting targets within two years of becoming a Party, sustained institutional support needs to be ensured and a clear agenda and a work programme, with time-bound objectives, need to be established;

(e) The coordination mechanism should have both the human and financial resources to allow for its proper functioning. For this, an evaluation of the work ahead and of the resources needed has to be done and the necessary funds should be allocated to the relevant budget(s).

Box 2. Organization of target setting in Hungary

The Hungarian case presents a good example of how the cross-sectoral cooperation required for the implementation of the Protocol was achieved. The Government established a technical committee to assist the ministers in meeting their commitments. The committee included a wide pool of experts allowing it to cover all fields of the Protocol (e.g., from ministries and Government agencies for public health, environment and water management, local and regional development, economy and transport, agriculture, industry and national development, as well as a representative from the Prime Minister's office, regions and municipalities, relevant associations of waterworks, sewerage works, pools and spas, tourism, environmental NGOs and other interest groups). Even if of a technical nature, the committee had a clear political mandate. Resources were secured for its functioning and it was linked with other governmental programmes and plans relevant to the Protocol. It was a formal body with its own constitution and terms of reference that were formally approved by the responsible minister. However, it was flexible enough to make use of external experts and to exchange information with other bodies (e.g., scientific committees whose work was relevant for setting and implementing targets under the Protocol).

B. Baseline analysis

The implementation of the Protocol does not start from scratch, but should build on the ongoing and planned efforts related to the Protocol.

A baseline analysis should be carried out for each specific target area of paragraph 2 (a) to (n) under the Protocol's article 6.

Based on existing or compiled inventories of relevant information (for the purposes of the Protocol), a baseline analysis should be made that encompasses a systematic and thorough review and assessment of:

(a) Relevant national and international legal provisions and regulations, including transboundary waters agreements (the annex to this document lists examples of relevant international obligations);

(b) Strategies and goals set by different authorities and other stakeholders on issues related to the specific target area;

(c) Relevant activities, projects and research, such as those related to improving water quality and water supply systems, water protection and treatment, health surveillance and early warning, or to dissemination of information at the national and local levels;

(d) Available data sources and their completeness;

(e) The indicators used;

(f) Information on the current water-related environmental and health situation in the country;

(g) Information on projected impacts of climate change on water and health and results of vulnerability analysis;[1]

(h) Data (summaries/reports) relevant for each target area under consideration;

(i) Expert judgement on the issues related to the specific target area;

(j) Linkages between connected thematic areas (e.g., drinking water quality with water resources management and sanitation).

Box 3. Rapid assessment of drinking water quality

The target-setting process requires adequate data and information at several steps, particularly for baseline analysis, the identification and prioritization of problems and the formulation of targets and respective programmes of measures.

Rapid assessment of drinking water quality (RADWQ) is an example of a specific assessment tool. It provides a systematic and statistically representative "snapshot" of the drinking water quality situation in a given country or at any subnational level. RADWQ studies use intensive field work in a limited time span (i.e., of 4–6 months) to collect one-off sanitary inspection data and water quality data for a limited number of health-relevant (i.e., chemical and microbial) water quality parameters from a sample of statistically representative water supplies. A maximum of 1,600 water supplies are typically included in a study, and the key elements of the RADWQ survey design method ensure that:

(a) Different parts of a country are adequately represented (geographical spread);

(b) The selection of water supply technologies to be included reflects their importance;

(c) In the selection of water supplies, a random element is introduced;

(d) By adopting a cluster sampling strategy, the study is sufficiently practical as well as cost and time effective.

An analysis of RADWQ findings is useful for improving the knowledge and understanding of the drinking water situation in a country. A RADWQ study provides useful baseline information, for example: (a) to assess compliance with existing drinking water quality standards or guidelines; (b) to study prevalence of specific quality parameters of concern (e.g., arsenic or fluoride); (c) to identify most common sanitary risks; and (d) to check compliance for a particular type of water supply or to support assessing the public health risks to the population. The results of RADWQ assist in defining needs and long-term programmes for building national water quality surveillance capacities and provide a basis for identifying priorities for remedial and preventative action to improve drinking water quality. The RADWQ tool has been successfully piloted in several countries.

C. Identification and prioritization of problems

Analysis of the data on the water and health situation should help to identify specific problematic areas, such as insufficient quality of drinking water, or bathing water, the lack of access to sanitation and wastewater treatment for a significant part of the population, unsustainable use of water resources, or the health-related impacts of climate change. Based on the results of the baseline analysis, for each specific target area a preliminary assessment of key issues and problems should be made.

Baseline analysis will assist Parties in identifying issues that require focus and attention. In problem identification and prioritization, Parties need to address specific problems, unmet needs or concrete issues, inter alia:

(a) Assessment of compliance/non-compliance with relevant legislation and regulations (e.g., regarding drinking water quality, wastewater treatment, waste management or agricultural practices) and, in the case of non-compliance, analysis of the reason for this situation;

(b) Identification of gaps in regulations, monitoring and management systems, or information inventories;

(c) Identification of issues where a direct health impact is proven or can be expected;

1 For more information on this issue, please refer to the Guidance on Water and Adaptation to Climate Change developed under the Water Convention available online at: http://www.unece.org/env/water/publications/documents/Guidance_water_climate.pdf.

(d) Identification of priority issues at the State or local level, with a particular focus on rural areas.

Determining the magnitude of problems at different levels will support the prioritization of problems, i.e., decisions about what level of ambition targets should be set and about when and how targets should be reached.

D. Agreement on draft targets, programme of measures and indicators

On the basis of the previous steps, possible targets and target dates should be discussed and agreed upon by the concerned stakeholders within the coordination mechanism.

Targets should be understood in a very broad sense and not necessarily as quantifiable parameters only. A target is a commitment made to achieve a specific level of protection of human health and water resources, quality or service. Clear targets enable a focus on efforts and benchmark progress. Clear targets also provide the basis for developing continuous improvement strategies. If a situation is considered satisfactory, the target could be to maintain the current level of performance and results.

It should be noticed that, in accordance with article 7, paragraph 5, of the Protocol, Parties are obliged to report on their progress achieved towards reaching their targets. Thus, as part of the target-setting process, suitable quantitative and/or qualitative indicators need to be identified to measure progress towards targets.

The two types of indicators — quantitative and qualitative — are complementary and both are important for effective monitoring and evaluation as they can either cross-validate or else point out problems with each other. In choosing an indicator, the most important elements to consider are its reliability and validity. Reliability means that the indicator used must be accurate and consistent. Validity means that the information the indicators provide must be close to the reality they are measuring. Generally accepted criteria for good indicators are that they be specific, measurable, achievable, realistic and time-bound.

Table 2 shows some options for choosing targets and indicators, depending on the results of the baseline and gap analysis and the situations in the countries.

Table 2. Possible options for choosing targets and indicators

Problems/constraints/ unmet needs identified by baseline and gap analysis	Possible targets	Possible indicators
Legal and institutional issues: ▪ "Thematic" gaps in regulation ▪ Lack of national/local standards ▪ Insufficient institutional capacities ▪ Lack of enforcement	Revision of legal and institutional frameworks: ▪ Development/amendment of water code ▪ Establishment of water quality standards ▪ Creation/improvement of surveillance system ▪ Compliance with specific law ▪ Provision of incentives for compliance	▪ Existence of legal acts (e.g., existence of policies, strategies, executive acts) ▪ Existence of surveillance system
Lack of sound and reliable information, e.g., on the status of the water supply and sanitation services at the national or local level	Improved knowledge on the current situation: ▪ Establishment of information inventory ▪ Implementation of a rapid assessment	▪ Existing information inventory
Limited access to improved drinking water supply or wastewater disposal facilities or services	▪ Increase of access to improved technologies by ## per cent	▪ Population coverage with access to improved water supply and sanitation technologies

Problems/constraints/ unmet needs identified by baseline and gap analysis	Possible targets	Possible indicators
Management issues: ▪ Poor managerial procedures ▪ Insufficient human (untrained staff) and technical resources ▪ Poor quality management (poor management practices, bad planning) ▪ Poor maintenance strategies	Effective managerial system: ▪ Capacity-building for staff ▪ Creation of general and technical guidelines ▪ Improved payment and selection of staff ▪ Performance control of management ▪ Improved maintenance procedures	▪ Number of hours/ programmes of training provided ▪ Existence of good practices, managerial guidelines, technical specifications ▪ Sufficient (quality and quantity) human resources ▪ Number of water service providers with performance control
Monitoring issues: ▪ Poor monitoring procedure guidelines ▪ Insufficient human and technical resources ▪ Poor monitoring verification	Availability of reliable data: ▪ Introduce system for data quality control ▪ Extend monitoring system geographically or to other pollutants ▪ Training of staff	▪ Existence of monitoring procedures (national indicators) ▪ Existence of country-wide monitoring system that covers major pollutants (e.g., those under common indicators) ▪ Improved quality control procedures

For EU countries, several targets set may be closely related to existing EU requirements. Targets established under the Protocol can support and complement implementation of EU Directives in different ways by:

(a) Improving compliance. In a case where a Party faces compliance problems regarding specific obligations under the EU *acquis communautaire*, by setting targets it can develop a strategy to progressively improve such compliance;

(b) Complementing obligations of EU Directives. Parties may establish either more detailed or specific targets that go beyond current requirements of EU legislation or additional targets in areas that are currently not covered by EU legislation and which nevertheless are needed to address national problems.

Box 4. Possible relation between implementation of European Union Directives and the Protocol

Example 1: In its reporting under the EU Drinking Water Directive, Party A frequently observes problems of non-compliance related to naturally occurring fluoride. Under the Protocol, it sets the target to reduce non-compliance figures by X percent per year and to develop a plan of remedial measures to reach its target. Remedial measures under consideration include: (a) development and introduction of low-cost and robust treatment technologies; (b) change of source waters in regions where this is feasible; and (c) providing information to the population communicating the risks regarding fluoride intake from drinking water.

Example 2: Under the EU Drinking Water Directive, specific obligations are set for water supplies serving more than 50 people. In Party B, a significant proportion of the population in the rural areas is served by private or community wells serving less than 50 persons. These wells are currently not regulated in Party B. Moreover, anecdotal evidence suggests that the quality of water supplied by these wells is less good than for bigger centralized systems. Thus, Party B might decide to set a variety of targets related to private or community wells that would incrementally improve the situation in the long term. Examples of individual targets may include: (a) formulation of regulations, in addition to current EU requirements, which specify specific quality and surveillance requirements; (b) establishing a water quality information inventory for those supplies that enables a regular review of commonly faced problems; and (c) improving good practices in operation, maintenance and inspection of such supplies, for example, through development of technical guidance materials, professional support mechanisms and adequate training programmes.

A successful process of target setting and the enforcement of targets will depend, among other factors, on the following minimum conditions:

(a) An established legal framework with clear provisions in relation to the respective targets;

(b) Effective and well-resourced institutions that practically enforce measures towards meeting respective targets;

(c) Effective mechanisms for data collection and analysis which enable an evaluation and, if necessary, redirection of implementation strategies.

Each set of targets needs to be linked to a clearly defined set of concrete measures. The implementation of the programme of measures will ultimately guarantee that the target is achieved. To be effective, each measure needs to be bound with concrete timelines, have clearly defined responsibilities for implementation and be provided with sufficient allocation of personnel, technical and financial resources.

In the target-setting process, it is of key importance that the formulation of targets and respective measures planned is realistic in terms of achievability. Effective targets should always encourage improved performance and should motivate stakeholders. Targets that are too difficult debilitate rather than motivate. Targets that are too easy often lead to complacency.

In target setting, therefore, there is an inherent need to be realistic. Feasibility analysis will assist in identifying realistic targets and programmes of measures. The following aspects should carefully be considered during the whole target-setting process:

(a) Availability of know-how and financial, institutional, technical and personnel resources;

(b) Technical achievability and feasibility of remedial measures envisaged;

(c) Financial implications and cost-effectiveness ratios of individual measures envisaged;

(d) Achievability of timelines;

(e) Review of likely prospects of success of implementing remedial measures;

(f) Complementarities with other existing strategies/projects;

(g) Social acceptability.

As available resources are frequently limited, it is important to identify priorities in terms of target setting. Various options in target formulation and in defining respective programmes of measures should be reviewed in terms of priority, using one or more of the following criteria:

(a) Contribution to the reduction of the water-related disease burden;

(b) Contribution to the reduction of inequalities (e.g., urban vs. rural);

(c) Technical and financial feasibility of target achievement;

(d) Cost-effectiveness ratios of individual targets;

(e) Environmental sustainability.

Optimally, targets that address the greatest risk to public health and maximize efficiency and sustainability of the use of available resources will receive the highest priority and political attention.

As resources towards target achievement are frequently limited, targets should always be defined by adopting a stepwise approach that allows for incremental improvements over time. In a stepwise approach, Parties may define targets and programmes of measures to be taken in the short, medium and long term. While some short-term targets will be actionable immediately and may require limited costs, other long-term targets may need to be addressed over time as they require additional resources. Adopting such an approach will allow Parties to give priority to targets that can be realistically achieved in the short term and to revisit other or complementary targets in the following iteration cycle of target setting.

Box 5. Setting targets at the national and local levels

One of the challenges that Parties face when setting targets is the correlation between the targets to be set at different national and local levels. Issues that need to be tackled include: (a) the lack of correspondence between the political and administrative boundaries and river basins' geographical limits; and (b) the lack of "geographical visibility" for underground water bodies. Further difficulties exist within the boundaries of a Party: regional or more local differences are often explicit in administrative, political and social terms and in order to reach a consensus, priority-setting and conflict resolution are needed at the national level. Finally, the complexity of the situation is also linked with differences in local "water cultures", water uses, sensitivities and expectations along the course of a given river. Of particular relevance are the differences in land occupation and urbanization levels within a given river basin, with its implications in terms of watercourse protection.

An increasing mobilization of local State services is unavoidable: large water basin and sub-basin levels are structural elements that should be the basis for dialogue construction, creating when necessary the suitable water coordination bodies, as is already often the case. It is important to keep a link between these proposed local structures and the international commissions for river management when they

do exist. Such bodies should involve local politico-administrative stakeholders, since they will be on the front line in the implementation of the Protocol. Parties should make their best efforts to involve representatives of all relevant sectors and the related administrations, which need to be effectively mobilized if Parties want to meet their targets in terms of water quantity as well as water quality. When they are in place, river basin authorities could be used as front runners.

The starting point regarding the different targets needs to be thoroughly analysed and documented at the local level, and targets should be conceived, debated and elaborated at the same level.

The responsible national competent authority or authorities should strive to ensure that those at the basin and sub-basin levels have the means to establish good dialogue based on the communication of data relevant to the targets; the key elements of the Protocol such as its legally binding components; the Guidelines; national legal requirements; and organizational solutions that can contribute to the targets. Parties should secure sustained institutional support for the long term so that the local work can continue over the number of years deemed necessary to implement and monitor the Protocol.

Decisions relevant to the timing of and necessary funding for the targets should ultimately be made at the national level, taking account of the conclusions and commitment of the local State administrations and the long timescale needed to obtain visible results. Of particular relevance is the issue of cost. A cost-benefit analysis is necessary to ensure that the targets are proportionate to the needs and are shared and supported by local stakeholders.

The Protocol aims at a profound change of mentality, i.e., a move away from the usual pollution treatment solutions towards more control and prevention. In a necessary dialogue outside politico-administrative boundaries, stakeholders have a key role to play in expressing society's expectations and in building consensus. Consumer associations and NGOs, the scientific community, the private sector and the general public can help provide facts and mobilize the necessary means and networks. The participation of these stakeholders at national or more local levels should be gradually adapted by the Parties to the stakeholders' contribution to the Protocol targets, also taking account of the equilibrium between and necessary diversity of the different stakeholders.

On the basis of a river-basin analysis of the situation, Parties may decide on targets that can be organizational, with the related regulatory implications, or on practical targets such as the development of river basin management plans, the construction of wastewater treatment plants, monitoring networks, common standards (quantity/quality) and the enhancement of the network of laboratories.

It may not be necessary or possible at this stage to undertake comprehensive cost-benefit analysis for all the possible targets under discussion. However, some sort of assessment of benefits in combination with the costs may be of help in getting political and financial support for actions. The process could be supported by appropriate political and financial strategies, which could help:

(a) To assess total investment needs of target setting;

(b) To identify investment needs for short- to medium-term targets;

(c) To identify policies and measures which are necessary to finance the achievement of the targets;

(d) To support claims of relevant ministries responsible for municipal services on the public budget;

(e) To prepare and make the case for external funding requests (e.g., to donors or to the Project Facilitation Mechanism);

(f) To improve accountability;

(g) To improve monitoring.

Parties should collect information on possible funding instruments. Guidance on the implementation of macroeconomic analysis is available from a number of sources, including the World Health Organization (WHO), as far as water supply and sanitation and the reduction of water-related disease are concerned. However, the importance of microeconomics, i.e., the balance of benefits accrued against expenses to be incurred at the individual level in the context of the individual economic situation, should also be recognized.

Parties shall encourage research related to development of cost-effective techniques for setting targets that ultimately will contribute towards the prevention, control and reduction of water-related disease and to the sustainable use of water resources.

In order to fulfil the commitments and maintain a stable work flow towards achieving targets, the final targets should be officially approved/endorsed by the Government.

Box 6. FEASIBLE: example of a decision-support tool to support the preparation of environmental financing strategies for water, wastewater and municipal solid waste services

Financial issues such as the costs of achieving goals, how the costs can be minimized, and the challenge of matching the costs with available resources often constitute serious obstacles for many countries. FEASIBLE is a software tool developed to support the preparation of environmental financing strategies for water, wastewater and municipal solid waste services. The FEASIBLE model is freeware and can be obtained through the web pages of the Organization for Economic Cooperation and Development (OECD), the Danish Ministry of Environment (DEPA), the Danish Environmental Protection Agency (DANCEE) and COWI.[2] FEASIBLE can be used to facilitate the iterative process of balancing the required finance with the available finance. It provides a systematic, consistent and quantitative framework for analysing the feasibility of financing environmental targets. Being a computerized model, FEASIBLE may be used to analyse "what if" a certain policy is changed and to document the financial impacts in a systematic and transparent manner.

The basic approach underlying the FEASIBLE method is: (a) to collect detailed technical data on existing infrastructure; (b) to select public policy targets in water supply; (c) to determine costs and timetables for achieving such targets; and (d) to compare the schedule and volume of expenditure needs with available sources of finance. This approach reveals any financial deficits likely to arise along the way. FEASIBLE also can be used to develop various scenarios to determine how potential gaps might be closed, such as identifying ways to help achieve the targets at lower cost or to mobilize additional finance, setting less ambitious targets, or rescheduling the programme. These results help policymakers understand where the main bottlenecks are as well as where, when and what additional policy interventions are needed to facilitate effective financing of infrastructure development programmes.

An important feature of FEASIBLE is the emphasis on realism and affordability. In addition, FEASIBLE can be used to assess the levels of finance (public, private, domestic, foreign) that might be available under different macroeconomic and fiscal conditions. This provides a check on what public budgets might realistically be expected to contribute. FEASIBLE is usually used to support a process of dialogue and consensus-building among stakeholders and to build bridges between policy development and implementation.

E. Broad consultation on the proposed targets, target dates and relevant programme of measures

In accordance with article 6, Parties shall make appropriate provisions for public participation within a transparent and fair framework and shall ensure that due account is taken of the outcome of such participation. Public participation will enhance the social acceptance of the targets, contribute to a relevant and realistic outcome of the target-setting process and ensure that there are partners, such as NGOs, for the implementation of the programme of measures.

To this end:

(a) The proposed targets, target dates and relevant programme of measures should be disseminated as much as possible to the broader public, relevant professional communities and other stakeholders;

(b) To allow an informed participation of the public and relevant stakeholders, necessary information should be made available. Thus, information about the ongoing process of target setting could be published on the Internet and regularly updated;

(c) Consultation with the public should be organized to present and discuss the draft targets and programme of measures. This can include public hearings, online consultations, workshops, etc.;

(d) External actors and organizations can be used to spread information about the Protocol;

(e) If consultations take place at the local, provincial and national levels, they should be mutually reinforcing;

(f) The opinions of the public and stakeholders should not only be consulted, but also taken into account in the elaboration of the documents and further elaboration/revision of the targets and programme of measures;

(g) The creation of a permanent consultative council with the various stakeholders involved can be considered.

2 Consultancy within Engineering, Environmental Science and Economics (www.cowi.com).

Box 7. Involving the public in decision-making: examples from Ukraine

In Ukraine, there have been a number of examples of broad public consultation processes related to the decision-making process on environment, health and water issues at the national level.

1998–1999: Broad public consultations to comment on the draft of the National Environmental and Health Action Plan (NEHAP) were organized through the cooperation of the National Coordinator with three environmental NGOs. After five regional seminars, more then 700 public comments were gathered. The leading experts then prepared new drafts of the NEHAP chapters. The final official edition included a surprisingly large number of the comments from the public.

2001: Public consultations in nine regions and public hearings of the draft Law on Drinking Water and Drinking Water supply of Ukraine at the national level were initiated and organized by the NGO "MAMA-86" after the first hearing on the draft Law in the Parliament. The document was broadly disseminated by the MAMA-86 NGO network to the public and stakeholders. Over a two-month period public comments were collected, which were discussed at the public hearings in October 2001 in Kyiv. As a result of these public consultations and hearings more than 150 amendments from members of the public to the draft Law were delivered to the Law Drafting Group. The Group was led by the State Committee on Housing and Communal Services of Ukraine. Representatives of all responsible ministries and State departments as well as main stakeholders and experts, including NGOs, had been invited to participate in this work. During November–December 2001, all the comments and amendments made by stakeholders, including the public, were presented and discussed at the Law Drafting Group meetings and finally at the meeting of the Parliamentary committee responsible for the Law. As a result, one third of public's amendments were taken into due account and incorporated into the Law, which was adopted by the Parliament of Ukraine in January 2002.

2004: Public consultations were initiated by MAMA-86 to discuss the draft of the State Programme on "Drinking water of Ukraine". Twenty-six NGOs gathered 110 public comments, which were discussed at the public hearings. The results of the consultations were presented and discussed at the public hearings, and the outcomes of this public process were delivered to the State editing group. The main public comments adopted were on rural water supply and sanitation sector rehabilitation and construction, as well as on additional local water purification development to provide safe water for sensitive consumer groups, including children, hospitals, schools and inhabitants of Chernobyl and environmental disaster areas. In addition, a section on public information, education and the upgrading of skills of the water and sanitation personnel, as well as the co-funding principle on the allocation of State budget for the water supply and sanitation measures at provincial and local levels, were incorporated into the State Programme. The Programme was adopted in March 2005.

The public should be informed in due time about the opportunities, procedures and criteria for providing comments on draft documentation and targets. Such information should be provided through websites as well as, if feasible, directly to the public, professional communities and other stakeholders requesting notification or who had otherwise been identified as in need of direct communication.

To preserve the quality of the decision-making process, transparent and clearly stated mechanisms and procedures should be established regarding the submission of and response to comments and the public should be informed accordingly.

Among the member States of UNECE, some have long and rich traditions of well-organized and institutionalized public participation. In these countries, a number of methods and techniques (e.g., panels, forums, workshops, public meetings and hearings and information markets) have been developed to enable this participation. In other countries involving the public in policy planning is still at an early stage and regarded as something new, yet developing. The availability of resources — be they related to finances, time, capacity, social traditions, information and/or creativity — can be a limiting factor. However, limits to effective participation processes should not be an excuse for avoiding participation, but rather a challenge to meet in order to reach the goal of creating the best possible conditions for successful participation.

Public involvement brings productive, long-term, trustful relationships between citizens and decision makers. Some key factors for making public involvement successful include:

(a) Clear communication about the purpose of the consultation and its relation to the overall target-setting process, and identifiable links between consultations and the final decisions;

(b) Information needs to be presented clearly and honestly;

(c) Enough time should be allowed for public and stakeholder scrutiny;

(d) Clear procedural rules are needed to promote power and information sharing among participants and decision makers;

(e) Processes that are viewed as legitimate by citizens and decision makers.

The following aspects have an important impact on the process of public consultations and their outcomes:

(a) Addressing stakeholders' concerns about the adequacy and quality of information;

(b) Addressing decision makers' concerns about sharing information and the constraints that apply to this process;

(c) Recognizing public participants' experimental and often anecdotal knowledge as a valuable information source.

F. Final agreement on targets and their publication and communication to all stakeholders, including the public and consumers

On the basis of the outcome of the public consultation, the proposed/draft targets should be revised as needed and consolidated.

The final, agreed targets and target dates should be endorsed at the appropriate political level (e.g., council of ministers or Parliament, depending on the national situation).

The agreed targets, target dates and programme of work must be published and brought to the attention of all stakeholders, at the national, provincial and local levels, as well as to the population. For this purpose, the Internet, relevant newspapers or television and other media should be used.

Relevant local and national organizations can also play an important role in disseminating and publicizing targets, target dates and monitoring programmes.

G. Implementation of the monitoring programme

Together with the targets set, a proposed monitoring programme to attain the targets in the agreed time frame should be defined and agreed upon. This programme should contain a clear time plan and political, administrative, behavioural and infrastructural indicators, based on the target set, a clear distribution of responsibilities and a financial strategy. Existing projects, strategies and other activities should be taken into account.

Implementation should start as soon as possible after the targets are agreed, and should be regularly evaluated. A programme committee can be established to this end which can meet once or twice a year to review the progress made and to adjust the monitoring programme if needed.

III. REVIEW AND ASSESSMENT OF PROGRESS AND REPORTING

A. Collection of data, assessment of progress and revision of targets

According to article 7, paragraph 1, Parties shall collect and evaluate data on progress towards the achievement of individual targets set.

Parties shall design indicators that show how far progress towards the targets has contributed towards preventing, controlling or reducing water-related disease. This is likely to require some experience with the targets set and with the review and assessment of progress towards them.

Moreover, when collecting data, Parties shall consider that, in their summary reports to the Meeting of the Parties to the Protocol, they are also required to provide general information related to the quality of water supplied, the scale and incidents of water-related disease, access to water and sanitation and the effectiveness of the management and the protection and use of freshwater resources, using common indicators (see table 4).

It is recommended that the coordination mechanism responsible for target setting be involved in the data collection, assessing and reporting under the Protocol. This will enable examination of the needs and possibilities to revise the targets according to recent knowledge and requirements.

When collecting data, Parties should consider the following:

(a) If possible or appropriate, joint data collection and data analysis with neighbouring countries are recommended;

(b) Linking data collection with EU reporting obligations is a feasible possibility;

(c) Responsible and coordinating bodies should be defined for the collection of data and for preparing the summary report (e.g., the Ministry of Health or Environment or other agencies and departments).

Every three years, on the basis of the data collection and evaluation, Parties shall review progress towards the targets and review their targets, with a view to improving them in the light of scientific and technical progress. Such review can also occur more frequently (e.g., every year).

Such review shall include a review of the targets set, with a view to improving them in light of scientific and technical knowledge. It is therefore necessary to establish feedback mechanisms linked to the evaluation of progress, involving reporting and follow-up procedures, and including informal mechanisms such as networking, which allows for the dissemination of ideas and information.

Ultimately, Parties should strive to present information on environment, water and health in a holistic and integrated manner rather than as a collection of single parameter indicators. Parties are therefore encouraged to establish integrative numeric indicators or to consider the use of systems that allow for the integrated compilation, storage and analysis of individual data sets (e.g., through use of geographic information systems (GIS)). Parties should also encourage the development of integrated information systems to handle information about long-term trends, current concerns and past problems and successful solutions to them in the field of water and health, and should provide such information to the competent authorities.

B. Publication of the data collected and of the evaluation

Every three years, Parties shall publish the results of the collection and evaluation of data (art. 7, para. 2) on their progress towards the achievement of targets. Moreover, article 7, paragraph 3, requires Parties to make available to the general public the results of water and effluent sampling carried out for this purpose.

Parties should ensure that data will not only be commonly available but also presented in readable, user-friendly and easily transferable formats. Practical arrangements for making the information accessible should be made. These can include:

(a) Publicly accessible websites;

(b) Publicly accessible lists, registers or files available at no charge;

(c) Active information and support to the public in seeking information (e.g., via newspapers or radio);

(d) Provision of points of contact (e.g. via newspapers or radio);

(e) Creation of a clearinghouse on the Protocol.

Box 8. Effectively accessible information

There is a world of difference between making information available to the public in a minimalist sense that it is not secret, and actually making it actively accessible in a user-friendly format that reflects the needs and concerns of the public. The difference is well-illustrated by the website set up by the NGO Friends of the Earth in the United Kingdom. This project took publicly available information from the United Kingdom Environment Agency's Chemical Release Inventory and entered it into a GIS-type database. The new website attracted massive public interest to data that had already been in the public domain, but had received little attention because it was unwieldy and difficult to sort through.

C. Preparation and submission of national summary reports to the Meeting of the Parties

According to the article 7, paragraph 5, each Party shall provide to the secretariat, for circulation to the other Parties, a summary report[3] on the data collected and evaluated, and the assessment of the progress achieved. This summary report shall be prepared in accordance with agreed guidelines and template by the Meeting of the Parties.

The following aspects should be taken into account in the process of preparation of the national reports:

(a) While relevant ministries are usually responsible for the preparation of the national implementation reports, these reports are submitted to the Meeting of the Parties in the name of the Government of a particular Party;

(b) Taking into account the wide spectrum of issues to be covered in the report and various respective responsibilities, it seems advisable that a national inter-ministerial consultation process on the report should take place at various stages of the preparatory process;

(c) The inter-ministerial consultations provide an opportunity for environment and health ministries to engage other relevant ministries (e.g., the Ministry of Finance, Development or Natural Resources), agencies and authorities at various levels of government in a discussion on the implementation of the Protocol. It can therefore be useful to identify, in advance of the consultation phase, a list of the various agencies and authorities that can contribute to the preparation process;

3 The Guidelines for summary reports in accordance with article 7 of the Protocol on Water and Health contain further information.

(d) Parties are also encouraged to consider the participation of all relevant stakeholders in the preparation and use of summary reports, including NGOs, civil society, local communities, business and the media, and therefore to organize a broader consultation on the draft report;

(e) Reports should be submitted to the joint secretariat so as to arrive no later than 210 days before the meeting of the Parties for which they are submitted;

(f) If the Parties wish to ensure a meaningful consultation process and the timely submission of reports, they may wish to consider using the following timeline for the national report preparation process, keeping in mind that the reports should be submitted to the secretariat 210 days in advance of the meeting of the Parties:

Table 3. Possible timeline for preparation of national summary reports

Process	Time required
Preparation of the draft summary report through inter-ministerial consultations	3 months
Consultation on the draft summary report with the broader community	30–60 days
Final report preparation (including translation, where necessary)	30 days
Submission deadline	210 days in advance of the meeting of the Parties

PART TWO

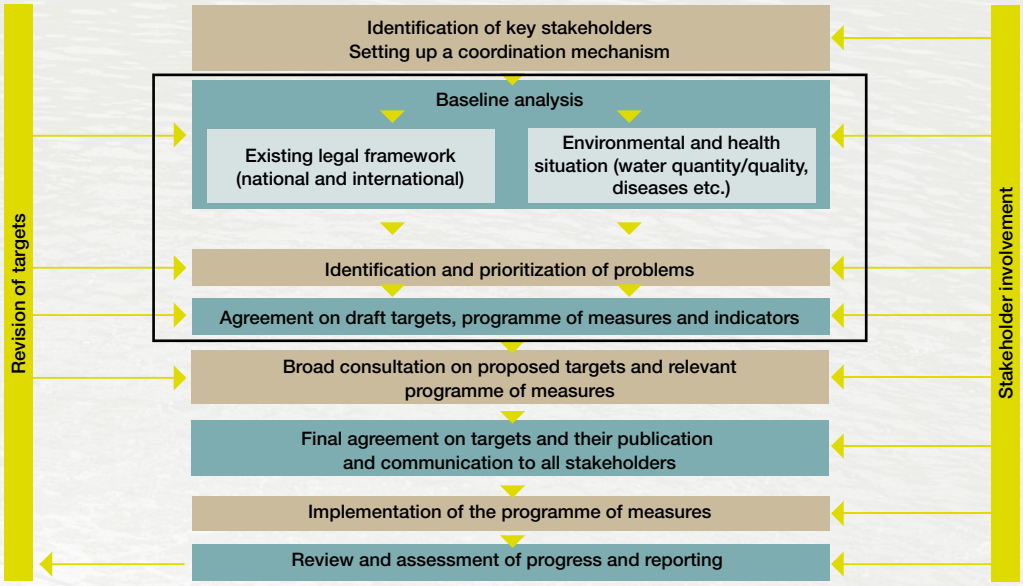
OPTIONS FOR SETTING TARGETS AND INDICATORS UNDER ARTICLE 6, PARAGRAPH 2 (A) TO (N)

INTRODUCTION

Part two of the Guidelines aims at providing more detailed guidance on how to decide upon specific targets in the different areas of article 6 paragraphs 2 (a) to (n) and how to chose relevant, target-specific indicators to measure progress towards such targets.

In accordance with the framework in part one, this part will thus provide indications on issues related to the baseline analysis, the identification of problems and the prioritization on the basis of which targets and target dates are set in the different areas.

Figure 3: Focus of part two within the logical framework for the target-setting process



For each of the different thematic areas according to paragraph 2 (a) to (n) of article 6, the Guidelines cover the following aspects:

(a) Background rationale;

(b) List of issues to be considered for the process of target setting;

(c) Where applicable, the common indicators related to the target area to be reported by all Parties when reporting;

(d) Relevant global and regional obligations and recommendations on reporting.

A. Target areas and target-related indicators: issues to be considered

Each thematic area is provided with a list of issues to be considered for the process of target setting, which should serve as a starting point for a self-assessment.

By considering the issues in the list, a Party should be able to identify problems and to get an initial indication on the nature of — and consequently the level of ambition of — targets which might be established under each given thematic area to address these problems (see table 2).

It should be understood that none of the lists aim to be exhaustive. Thus, Parties will need to look at the proposed lists from their specific perspectives and may need to address additional issues depending on their own needs and situations. The lists are therefore a "point of entry" to guide the process of target setting; they are neither complete nor do they provide any form of decision tree.

The process of target setting shall be accompanied by the identification of suitable target-related indicators to measure progress. Indicators might be of a quantitative or a qualitative nature.

B. Common indicators

For the sake of harmonization of progress in the pan-European region, Parties have also agreed to include in their summary reports to the Meeting of the Parties information on the quality of the drinking water supplied, on the scale of outbreaks and incidents of water-related disease, on access to drinking water and sanitation and on the effectiveness of the management, use and protection of freshwater resources, by using common indicators. Table 4 below presents the areas and common indicators to be used when reporting on them.

Table 4. Common indicators

Focus area	Common indicators
Quality of the drinking water supplied	**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*. **WatSan_S3.** Percentage of samples that fail to meet the standard for chemical water quality. All countries should monitor and report on fluoride, nitrate and nitrite, arsenic, lead and iron. In addition, each Party should identify five additional physicochemical parameters of special concern in their national or local situation and report on them.
Reduction of the scale of outbreaks and incidents of water-related disease	Real-time data on incidence and outbreaks of: (a) Cholera; (b) Bacillary dysentery (shigellosis); (c) Enterohemorrhagic E. coli (EHEC); (d) Viral hepatitis A; (e) Typhoid fever. Parties should specify if the numbers reported are related to all exposure routes or only to water.
Access to drinking water	Percentage of the population with access to improved drinking water for urban, rural and total population. Parties should specify how access to drinking water is defined and calculated in the country. The WHO-United Nations Children's Fund (UNICEF) Joint Monitoring Programme defines access to water supply in terms of the types of technology and levels of service afforded. Access to water-supply services is defined as the availability of at least 20 litres per person per day from an "improved" source within 1 kilometre of the user's dwelling. An "improved" source is one that is likely to provide "safe" water, such as a household connection, a borehole, a public standpipe or a protected dug well.
Access to sanitation	Percentage of the population with access to sanitation including small decentralized sewerage systems, and also septic and safe excreta disposal, for urban, rural and total population. Parties should specify how access to sanitation is defined and calculated in the country.
Effectiveness of systems for the management, protection and use of freshwater resources	**Water quality:** on the basis of national systems of water classification, percentage of water falling into each defined class (e.g.. in classes I, II, III, etc. for non-EU countries; for EU countries, percentage of surface water bodies with high, good, moderate, poor and bad ecological status; percentage of water bodies with good or poor chemical status; and percentage of groundwaters of good or poor status). **Water quantity:** water exploitation index at the national and river-basin levels for each sector (agriculture, industry, domestic): mean annual abstraction of freshwater by sector divided by the mean annual total renewable freshwater resource at the country level, expressed in percentage terms.

If Parties cannot report on such common indicators, they should consider setting targets that will eventually enable them to do so.

As these common indicators are closely related to target areas under article 6, paragraphs 2 (a), (b), (c), (d) and (m), Parties can consider setting targets by which progress can be measured through such common indicators. However, when the targets set are not related to such common indicators, other target-related indicators will need to be used.

In any case, these common indicators may be a way of demonstrating the overall impact of measures adopted to achieve the targets that have been set.

C. Relevant regional or global obligations and recommendations on reporting

The proposed approach to setting targets and the suggested target-related indicators are mostly based on indicators used or suggested for various reports to international organizations, in particular in the United Nations system.

The reporting obligations resulting from the *acquis communautaire* — which the 27 EU Member States are faced with — as well as other subregional reporting mechanisms (e.g. the European Environment Agency and Eurostat) have likewise been taken into account.

While EU legislation is directly relevant to only a portion of the pan-European region, it is referred to at times for two reasons. First, it informed the negotiations and implementation of the Protocol for a large number of countries that are either member States of the EU or countries that have accession agreements and intend to join. Secondly, EU standardization has resulted in a developed regional, if not international, practice in many of the subject areas of the Protocol. Any references made to EU legislation and practices in the text are meant to convey practical information and not to indicate any particular status of EU law with respect to the pan-European region.

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

A. Background rationale

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 *Guidelines for Drinking-water Quality*.[4]

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:
  - (i) Legal provisions;
  - (ii) Enforcement (e.g., ability of a competent authority to oversee and control communal water supply);
  - (iii) Intervention capacity (mechanisms available for the society/State to take measures for remediation).

(b) Availability and reliability of information on the water quality situation in collective water supplies:
  - (i) Monitoring of suppliers:
    - a. Laboratory capacity (e.g., resources and personnel);
    - b. Laboratory quality systems;
  - (ii) Surveillance (e.g., ability of a competent authority to form clear view of Collective Drinking Water Suppliers (CDWS)):
    - a. Data availability;
    - b. Data treatment (computational capacity);
    - c. Data transfer between the local and national levels;
    - d. Data analysis at the national level;

(c) Issues of quality of water supplied:
  - (i) Microbiological quality:
    - a. Problems to be settled at the source of the water (e.g., resource protection, wellhead protection);
    - b. Problems to be settled at the water treatment level (e.g., treatment ability, disinfection capacity);

4 Guidelines for Drinking-water Quality (Third edition), Volume 1: Recommendations, (Geneva: WHO, 2004). Available at: http://www.who.int/water_sanitation_health/dwq/gdwq3/en/index.html

c. Problems to be settled at the distribution level (e.g., pipework continuance and maintenance);

(ii) Chemical quality:

a. Issues related to the natural (geological) contamination of drinking water to be settled by treatment;

b. Issues related to anthropogenic pollution of the water sources;

c. Issues related to treatment for removal of pollutants;

d. Issues emerging on the level of the distribution system;

e. Issues emerging in domestic installations;

(d) Economic capacity:

(i) Financial resources allocated for intervention;

(e) Awareness-raising, education and training:

(i) Public campaigns to raise awareness on drinking water quality;

(ii) Actions to increase capacity of stakeholders (e.g., operators).

Box 9. Possible target: developing water safety plans for small-scale water supply systems

For several years, Women in Europe for a Common Future (WECF), in cooperation with local partners, has been observing and monitoring water pollution of small-scale water supply systems in rural areas of the Caucasus, Eastern Europe and South-Eastern Europe. Besides bacteria, WECF has identified nitrate as often polluting drinking (ground) water. Nitrate concentration in drinking water is easy to measure by quick tests, far more easy to measure than bacteria. Increased nitrate concentrations indicate an anthropogenic water pollution. In the experience of WECF, proving through water tests that there is severe anthropogenic pollution of drinking water often does not trigger any action by local or regional authorities, who lack the knowledge and means to restore water quality.

Water safety plans involving schools

To address the above-mentioned problems, WECF has created an educational package for schools to develop water safety plan (WSPs), in cooperation with other stakeholders, for their local small-scale water supply system. The educational package provides background information about the aims of the WSP, the properties of drinking water and sources of pollution and related health risks. Teachers and local NGOs are trained in how to develop a WSP for their local community and about possible activities with students. To raise awareness about existing drinking water pollution by synthetic fertilizers, animal and human waste, school staff members are provided with information about carrying out organoleptic observations and nitrate quick tests. All possible contamination points and potentially contaminating activities in water supply and sanitation should be identified and addressed using a questionnaire, checklists and field visits. Information and examples on how to report the results are available. The final products — maps, reports, posters, and a safe water strategy — give the local community information on how to avoid risks of water pollution and a tool for lobbying for local, regional and national action to assure their right to access to safe water.

In autumn 2008, staff of several Romanian schools developed a programme for 800 pupils related to WECF-WSP activities over several months. Depending on the level, background and skills of the teachers, the content of the programme varies from school to school. However, monitoring and mapping of nitrate pollution and the sources of the pollution, as well as publishing the results, were made obligatory for all the participating schools. The Romanian schools and NGOs are motivated to cooperate with the responsible authorities to share information about the water supply and related diseases, and have asked for more detailed water analyses on, for example, bacteria. So far, the nitrate tests of the tested drinking water in the eight participating villages showed nitrate levels far over the limit of 50 mg/l. The first results of the WSPs developed by schools were published and presented during the Danube Days 2009 in Romania.

Outlook

The approach to developing WSPs involving schools promises to be a good tool for community mobilization, for raising awareness on the need and requirements of water protection strategies, and for taking action at the local and national levels. For scaling up this WSP programme and for bringing the local findings and experiences up to national level, the topic should become mandatory in the national school curriculum. For many countries the WSP programme could be the bridge between setting targets under the Protocol at the national and local levels.[5]

5 For more information, see www.wecf.eu

C. Related common indicators

Parties agreed to include in their summary reports information related to the following indicators based on the Environment and Health Information System (ENHIS) developed by WHO in cooperation with the European Commission (full background information, including methodological development, is available at: 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 and iron.

Moreover, each Party shall report on five additional priority substances of their choice, the most problematic from a national/local point of view.

Box 10. Examples of targets and indicators set under article 6 (a) by the Czech Republic

Target	Deadline	Indicator
Reduction of cases of violations of drinking water quality limits.	31/12/2012	Percentage of quality limits violations
Publication of updated booklet on good management practice of wells.	31/12/2010	Booklet issued (yes–no)
Continuation of implementation of the Programme supporting exchange of lead pipelines in dwellings.	31/12/2013	Supporting programme announced every year

D. Relevant global and regional obligations and reporting systems

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 the public. Each report shall include, as a minimum, all individual supplies of water exceeding 1,000 m^3 a day on 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 in article 5, paragraphs 2 and 3, and monitoring programmes in article 7, paragraph 2.

In developing a national or local assessment, Parties may wish to take into consideration recent guidance material developed by WHO.[6]

II. REDUCTION OF THE SCALE OF OUTBREAKS AND INCIDENTS OF WATER-RELATED DISEASE[7] (ART. 6, PARA. 2 (b))

A. Background rationale

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 disease provides an indication of the quality of the drinking or bathing water and is linked to the performance of the water supply and the upstream sanitation systems.

B. List of issues to be considered for the process of target setting

According to specific local and national situation, Parties might wish to set targets related to diseases caused by water contamination, but also by lack of water. Parties might also wish to set targets related to diseases caused not only by microbiological contamination, but also by the chemical quality of water, such as blue baby syndrome linked to nitrate exposure, fluorosis linked to fluoride exposure and various arsenic-related toxic effects linked to arsenic exposure.

6 Thompson, T. et al., Chemical safety of drinking water: Assessing priorities for risk management (Geneva: WHO, 2007). Available at: http://whqlibdoc.who.int/publications/2007/9789241546768_eng.pdf

7 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.

In the target-setting process, the following aspects may be considered.

(a) The legal, institutional and administrative set-up:
  (i) A legally based surveillance system for detection, investigation and reporting of infectious diseases working on a sustainable basis;
  (ii) The effectiveness of the surveillance system;

(b) Availability and reliability of information on the water quality situation in collective water supplies:
  (i) The system of data flow and its sharing among all stakeholders;
  (ii) The completeness of the national database (gathering all local data into a central database);
  (iii) A quality assurance system for laboratories;

(c) Issues of water-related disease surveillance:
  (i) The system is working within a proper institutional framework, including the national health system (e.g., general practitioners);
  (ii) The system enables identification of water as an exposure route;
  (iii) Authorities involved in an outbreak investigation can order disclosure of information or request additional actions by the water utilities;
  (iv) A clear definition of outbreak is used in the national surveillance system;
  (v) The system enables identification of specific pathogen(s) causing the outbreaks (proper laboratory skills and capacities);

(d) Economic capacity:
  (i) The surveillance system is working on a sustainable basis.

C. Related common indicators

Parties agreed to include in their summary reports information related to real-time data on incidence (number of cases per year reported from all exposure routes) and on the number of outbreaks per year (potentially related to water) of:

(a) Cholera;
(b) Bacillary dysentery (shigellosis);
(c) EHEC *(Enterohaemorrhagic E. coli 0157:H7)*;
(d) Viral hepatitis A;
(e) Typhoid fever.

D. Relevant regional or global obligations and recommendations on reporting

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, viral hepatitis A and typhoid fever).

If possible, information should also be included on emerging diseases which are of relevance for the Party in question (e.g., campylobacteriosis, cryptosporidiosis, giardiasis and legionellosis, acute gastroenteritis of unknown but supposed infectious origin (diagnosis A09 according to the International Classification of Diseases (ICD)-10[8]) amaebia). A possible indicator is the real-time data on incidence (e.g., the number of cases per the year reported, or from all exposure routes).

Possible data providers include:

(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-Europe 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 under five age group;

8 ICD-10 was endorsed by the Forty-third World Health Assembly in May 1990 and came into use in WHO member States as from 1994.

(c) Epidemic and Pandemic Alert and Response, part of the Global Alert and Response Operations (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 one disease which is not yet recognized as being of prime importance by the experts from Parties: malaria.

III. ACCESS TO DRINKING WATER (ART. 6, PARA. 2 (c))

A. Background rationale

Access to safe 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 a basic human right by the United Nations General Assembly [9] and the Human Rights Council. 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.

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, subpara. (l)).

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:
- (i) Legal provisions relating to the drinking water supply of the population;
- (ii) Provisions related to the water supply for the population not covered by community supplies;
- (iii) Provisions relating to small and individual drinking water supplies;
- (iv) Provisions for available financial instruments to assist communities in establishing a safe drinking water supply;
- (v) Provisions for emergency situations;

(b) Issues of reliable information:
- (i) Availability of information on population coverage (number of people with/without access to community supply);
- (ii) Availability of information on the quality and quantity of water consumed by the population without access to community supply;
- (iii) Special education/awareness programmes, especially in the rural areas at the village level;
- (iv) Trainings on public health for operators of small water supply systems;

(c) Issues of quality:
- (i) Assessment of prevalent quality problems of small/individual water supplies;
- (ii) Assessment of risks pertaining to water quantity and quality problems for individual water supplies;
- (iii) Assessment of adequate resource protection (zoning and enforcement);

(d) Issues of economic capacity:
- (i) Capacity of reliable metering of water supplied and consumed;
- (ii) System of State subsidies for disadvantaged groups and its sustainability;
- (iii) Sustainable water pricing in community systems;
- (iv) Supply systems' economic sustainability;
- (v) Affordability of access to community systems;
- (vi) Affordability of access to good quality drinking water in small/individual supplies;

(e) Awareness-raising, education, training:
- (i) Provisions for upgrading the understanding and skills of individual water providers;
- (ii) Provisions for awareness, training and education of users of community and non-community supplies.

9 General Assembly resolution 64/292 (2010) on the human right to water and sanitation.

C. Related common indicators

Parties agreed to include in their summary reports information related to access to improved drinking water. The WHO-United Nations Children's Fund (UNICEF) Joint Monitoring Programme (JMP) defines access to water supply in terms of the types of technology and levels of service afforded. Access to water-supply services is defined as the availability of at least 20 litres per person per day from an "improved" source within 1 kilometre of the user's dwelling. An "improved" source is one that is likely to provide "safe" water, such as a household connection, a borehole, a public standpipe, or a protected dug well. If a Party defines access in a different way, it can report according to its definition and make explicit the definition it uses to calculate access.

Box 11. Examples of targets and indicators on access to drinking water

Hungary has chosen the following approach/targets: (a) a nationwide survey on the population without access to drinking water, and exploration of feasible solutions; and (b) the development of a system of social subsidies to implement the human right to water.

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.

The **Czech Republic** has set the following targets: (a) elaboration of a development plan on water supply and sanitation systems for the whole territory of the country; and (b) facilitation of connection of residences in suburbs and in small villages to the public water supply.

D. Relevant global and regional obligations and recommendations on reporting

JMP[10] 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. JMP is the officially designated monitoring programme by which progress towards the Millennium Development Goal (MDG) relating to drinking-water and sanitation is being assessed. However, JMP neither includes the daily availability of water at home nor the quality of the water delivered.

Additional information is also available from other sources, e.g., Eurostat and the OECD.

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[11] water supply and access to safe water supply in accordance with the WHO Guidelines on Drinking-water Quality or a similar national legal framework.

IV. ACCESS TO SANITATION[12] (ART. 6, PARA. 2 (d))

A. Background rationale

Provision of sanitation to everyone is among the most important objectives of the Protocol (art. 6, para. 1), and a human right recognized by the United Nations General Assembly[13] and the Human Rights Council. 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.

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

- (i) Legal provisions relating to access to sanitation (sewerage systems) by the population;
- (ii) Provisions/rules relating to individual sanitation systems;
- (iii) Provisions for available financial instruments to assist communities in accessing sanitation systems;
- (iv) Provisions for emergency situations;
- (v) Supervision (ability of a competent authority to control access and access conditions);
- (vi) Data availability;

10 Information on JMP is available at: http://www.wssinfo.org/en/welcome.html

11 According to the JMP definition, improved drinking water sources include: (a) piped water into dwelling; (b) piped water into a 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) an unprotected dug well; (b) an unprotected spring; (c) a 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.

12 According to article 2 of the Protocol, "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.

13 General Assembly resolution 64/292 (2010) on the human right to water and sanitation.

(b) Issues of reliable information:

  (i) Availability of information on population coverage (number of population with/without access to sewerage systems);

  (ii) Availability of information on the quality and quantity of sewage drained and treated;

(c) Issues of infrastructure:

  (i) The percentage of the population served by sewerage connections and wastewater treatment plants, making a possible distinction between primary, secondary and tertiary wastewater treatment plants;

  (ii) Existence of primary, secondary and tertiary wastewater treatment plants;

  (iii) Existence of decentralized systems for small settlements and on-site sanitation;

(d) Issues of economic capacity:

  (i) Sustainable pricing of sewerage;

  (ii) Sewerage systems economic sustainability;

  (iii) Affordability of access to community systems;

(e) Awareness-raising, education, training:

  (i) Provisions for upgrading the understanding and skills of local governments and community supply providers;

  (ii) Provisions for upgrading the understanding and skills of individual system operators.

C. Related common indicators

Parties agreed to include in their summary reports information related to access to the percentage of the population with access to improved sanitation. According to JPM, an improved sanitation facility is a facility that hygienically separates human waste from human contact. If a Party defines access in a different way, it can report according to its definition and make explicit the definition it uses to calculate access.

Box 12. Examples of targets related to access to sanitation

Finland

Centralized sewerage and wastewater treatment is the goal wherever technically and economically feasible in terms of water services and environmental protection. Areas meeting these conditions are determined so that centralized sewerage and wastewater treatment can be implemented before expiry of the deadline imposed in the Government Decree on property-specific wastewater treatment requirements (542/2003). Property owners shall render property-specific sanitation systems compliant with requirements in those cases where connecting the property to the collective system of sanitation is not a viable option due to the location of the property.

Czech Republic

Finalization of construction of missing sanitation (wastewater treatment plants and sewerage) and improvement of wastewater treatment technology to comply with the requirements of the 91/271/EEC Directive. Construction of wastewater treatment facilities in small settlements with less than 2,000 inhabitants, where the sewerage system exists.

D. Relevant global and regional obligations and recommendations on reporting

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.

According to EU Urban Wastewater Treatment Directive 91/271/EEC, 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 sludge in their areas.

Additional database and reporting systems on access to sanitation include ENHIS,[14] the Joint Eurostat/OECD questionnaire, the Health for All Database and the Environment Information and Observation Network (EIONET)/European Environment Agency (EEA) WATERBASE.

14 See http://www.enhis.org/.

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

A. Background rationale

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. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

  (i) Legal or regulatory obligations in relation to levels of performance;

(b) Issues of management:

  (i) Existing benchmarking requirements;

  (ii) Average continuity of drinking water supply;

  (iii) Failure rates to comply with legally required residual chlorine at point of consumption (in countries with mandatory chlorination only);

  (iv) Main failures (including failures of valves and fittings);

  (v) Water loss;

  (vi) Produced by certified (e.g., International Organization for Standardization (ISO)) suppliers, or other quality assurance systems;

  (vii) Complaints received by authorities and/or service providers in relation to the performance of services;

  (viii) Capacity to cope with extreme weather events and to implement the Guidance on Water Supply and Sanitation in Extreme Weather Events;

(c) Economic capacity:

  (i) Efficiency, sustainability and affordability criteria of the water utility;

  (ii) Water price and social accessibility (e.g., comparing the cost for water with the income of the family).

C. Relevant global and regional obligations and reporting systems

Not applicable.

VI. LEVELS OF PERFORMANCE OF COLLECTIVE SYSTEMS AND OTHER SYSTEMS FOR SANITATION (ART. 6, PARA. 2 (e) (continued))

A. Background rationale

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.

Targets and indicators for the level of performance of collective systems for sanitation need to include issues in relation to 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 (see art. 2, para. 9).

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) Legal or regulatory obligations in relation to levels of performance;

(b) Existing benchmarking requirements;

(c) Pump failures;

(d) Blocking of sewers;

(e) Treatment efficiency for the removal of organics and nutrients;

(f) Price of the wastewater services;

(g) Sustainability of the operator under given economic, environmental, technical, financial, operational and human resources conditions;

(h) Complaints received by authorities and/or service providers in relation to the performance of services;

(i) Capacity to cope with extreme weather events and to implement the Guidance on Water Supply and Sanitation in Extreme Weather Events.

C. Relevant global and regional obligations and reporting systems

The Programme for the Assessment and Control of Marine Pollution in the Mediterranean Region (MED POL), the scientific and technical component of the 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.[15] It publishes guidelines on sewage treatment and disposal and monitors the application of these guidelines throughout the Mediterranean region.[16] At present, MED POL assesses sewerage and performance of sewage systems in all Mediterranean cities with populations of more than 2,000 inhabitants.

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

A. Background rationale

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.

B. List of issues to be considered in the process of target setting

The WHO *Guidelines for Drinking-water Quality* recognize 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 (WSP). The WSP approach complements the compliance-based approach and may reduce both the workload and financial expenses related to verification monitoring.

WSPs are seen as a viable approach to safe drinking water through small scale water supplies, including private wells, provided that an enabling environment is created that supports WSP implementation in small supplies by providing external expertise, the establishment of partnerships among suppliers, the preparation and distribution of easy to understand guidance documents and training and education.

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

In the target-setting process, the following aspects may be considered:

(a) Legal and/or regulatory obligations to apply recognized good practices;

(b) Certification schemes in relation to universally accepted standards which are independently verified, such as the ISO 9000 or ISO 14000;

(c) Implementation of an independently verified water safety plan or ISO 22000 certification;

(d) Certification of components to universal standards, for example laboratory accreditation by national accreditation bodies;

(e) Systems for the establishment of approved protection zones;

(f) Type of treatment technologies employed for different raw/source water qualities (e.g., in cases where it is not possible to protect water sources properly, are there systems for compensating for this with advanced water treatment plants);

(g) Availability and accessibility of acknowledged codes of good practice or international standards in relation to construction, maintenance and operation of technical infrastructures, such as abstraction, treatment, storage and distribution;

(h) Integrated water resource management plans.

15 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.

16 See, for example, United Nations Environment Programme, Guidelines on Sewage Treatment and Disposal for the Mediterranean Region (2004).

C. Relevant global and regional obligations and recommendations on reporting

Not applicable.

Box 13. Example of targets in relation to good practices in the management of water supply

Finland

The major targets with respect to drinking water quality involve reducing nutrient inputs causing eutrophication, reducing the risks arising from harmful substances and protecting groundwater.

VIII. APPLICATION OF RECOGNIZED GOOD PRACTICES TO THE MANAGEMENT OF SANITATION (ART. 6, PARA. 2 (f) (cont.))

A. List of issues to be considered in the process of target setting

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. In the target-setting process, the following aspects may be considered:

(a) Legal and/or regulatory obligations to apply recognized good practices, including for areas without centralised water supply/sanitation or dry sanitation;

(b) Certification schemes in relation to universally accepted standards which are independently verified, such as the ISO 9000 or ISO 14000;

(c) Implementation of an independently verified water safety plan;

(d) Certification of components to universal standards, for example laboratory accreditation by national accreditation bodies.

B. Relevant global and regional obligations and recommendations on reporting

Possible indicators at the level of the individual utility include:

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

(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.

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.

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

Possible indicators at the level of the river basin or country include:

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

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

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

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

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

IX. OCCURRENCE OF DISCHARGES OF UNTREATED WASTEWATER (ART. 6, PARA. 2 (g) (i))

A. Background rationale

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 the target set out in paragraph 2 (d); thus, the target in 2 (g) concentrates on the (non-) treatment of wastewater.

B. List of issues to be considered in the process of target setting

In the target-setting process, the following aspects may be considered:

(a) Legal provisions (obligation for treatment of polluted water according to the local situation, standards for different kinds of storage of untreated water), standards for different kinds of storage of untreated water):

  (i) Enforcement (i.e., regular inspection, penalties for non-compliance with the obligations).

(b) Issues of reliable information:

  (i) Monitoring of surface and groundwater quality;

(c) Issues of management:

  (i) Prevention of accidental pollution as a priority;

  (ii) Set priorities based on environmental impact assessment;

  (iii) Emergency reaction capacity (contingency planning);

  (iv) Quality of sewerage systems and wastewater treatment;

(d) Awareness-raising, education and training:

  (i) Informing the population, small companies, water suppliers and authorities etc. about the seriousness of the impacts of untreated wastewater on human health and the environment;

  (ii) Provision of access to water quality data to the population.

C. Relevant regional or global obligations and recommendations on reporting

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.

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 15 old EU Member States (EU-15) and by 2015 in the new EU member States.

A review of definitions of wastewater treatment plants, their advantages and disadvantages can be found in the WHO/United Nations Environment Programme (UNEP)/Food and Agriculture Organization of the United Nations (FAO) *Guidelines for the Safe Use of Wastewater, Excreta and Greywater*.[17]

X. 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

The second part of article 6, paragraph 2 (g), of the Protocol requires the setting of targets and target dates related to the occurrence of discharges of untreated storm water overflows from wastewater collection systems to waters within the scope of the Protocol.

B. List of issues to be considered in the process of target setting

Storm water overflow represents a significant risk, but is not addressed in detail in EU 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.

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

  (i) Legal provisions for separation of drainage and wastewater (if possible);

  (ii) Obligations for wastewater treatment installations to include a storm water retention basin;

  (iii) Enforcement (inspection and penalties);

(b) Management issues:

  (i) Construction of retention basins or of dual systems for drainage and wastewater and appropriate design of wastewater treatment installations;

  (ii) Landscape planning favouring natural groundcover as opposed to impermeable covers.

17 See Volume II: Wastewater Use in Agriculture, p. 82, table 5.3. Available from: http://www.who.int/water_sanitation_health/wastewater/gsuww/en/index.html

C. Relevant global and regional obligations and reporting systems

According to 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."

XI. QUALITY OF DISCHARGES OF WASTEWATER FROM WASTEWATER TREATMENT INSTALLATIONS TO WATERS WITHIN THE SCOPE OF THE PROTOCOL (ART. 6, PARA. 2 (h))

A. Background rationale

Article 6, paragraph 2 (h), of the Protocol requires the setting of targets and target dates related to the quality of discharges of wastewater from wastewater treatment installations to waters within the scope of the Protocol. This indicator refers explicitly to the quality of wastewater discharges from wastewater treatment systems that are often not reported on and often do not comply with the legal requirements.

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative setup:
  - (i) The existence of legal provisions:
    - a. Permit systems for industrial wastewater discharges;
    - b. Standards for both urban and industrial wastewater treatment effluent quality;
  - (ii) The enforcement of legal provisions:
    - a. Intervention capacity;
    - b. Contingency planning of emergency response measures in case of accidents;
    - c. Risk assessment;

(b) Existence of appropriate infrastructure:
  - (i) Appropriate location of collection systems and treatment installations;
  - (ii) Existence of well-functioning and technologically appropriate treatment installations;
  - (iii) Appropriate maintenance of these treatment stations;
  - (iv) Appropriate treatment technology also in small-scale systems;

(c) Issues of quality:
  - (i) Organic pollution: COD, BOD, total suspended solids, nitrogen and phosphorus;
  - (ii) Chemical pollution and dangerous chemical substances;
  - (iii) Microbiological indicators, e.g., faecal coliforms, pathogens;
  - (iv) Hazard mapping and appropriate adaptation of the treatment system;
  - (v) Appropriate selection of the sites/ rivers/lakes for discharge of treated effluents;

(d) Issues of information:
  - (i) Regular measuring of wastewater quality discharged from treatment stations;
  - (ii) Regular inspections of wastewater treatment installations and industrial sites;
  - (iii) Existence of industrial accidents notification system for national population and that of downstream countries;

(e) Awareness-raising, education and training:
  - (i) Appropriate and regular training of staff of treatment stations;
  - (ii) Informing the population about pollution prevention, remaining risks after treatment, etc.;

(f) Economic capacity:
  - (i) Application of the polluter pays principle: cost recovery of treatment costs through the polluter (water user fees (if possible) in case of urban wastewater treatment and payment by the company in case of industrial wastewater).

C. Relevant regional or global obligations and reporting systems

EU Wastewater Directive 91/271/EEC sets standards for BOD, COD and total suspended solids. For drinking water capture zones under sensitive areas, it also requires compliance with standards for nitrogen and phosphorus.

EU Integrated Pollution Prevention and Control (IPPC) Directive 96/61/EC includes an indicative list of the main polluting substances to be taken into account if they are relevant for fixing emission limit values.

EU Directive 2006/11/EC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community contains two lists of families and groups of dangerous substances. It stipulates that States shall take the appropriate steps to implement measures to eliminate or reduce pollution of the waters by the dangerous substances. In order to implement the Directive States shall establish emission standards, set up obligatory authorization of discharges and specific programmes to reduce occurrence of some substances in water. EU member States report regularly on implementation of the Directive. Elimination or reduction of dangerous substances put into water resources is of great importance as these substances endanger human health as well as ecosystems and once they are in the water it is hard to remove them.

Box 14: Example for targets regarding quality of wastewater discharges

Czech Republic

To eliminate or reduce priority and priority hazardous substances in water, i.e., comply with requirements of the EU Directives on priority and priority hazardous substances discharge to water.[18]

To fulfill requirements of Directive 2000/60/EC, establishing a framework for EU member State action in the field of water policy concerning achievement of good water status.

XII. DISPOSAL OR REUSE OF SEWAGE SLUDGE FROM COLLECTIVE SYSTEMS OF SANITATION OR OTHER SANITATION INSTALLATIONS (ART. 6, PARA. 2 (i), first part)

A. Background rationale

The first paragraph of article 6, paragraph 2 (i), of the Protocol requires the setting of targets and target dates related to the disposal or reuse of sewage sludge from collective systems of sanitation or other sanitation installations taking into account the WHO/UNEP/FAO guidelines for the safe use of wastewater, excreta and greywater in agriculture and aquaculture.[19]

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

- (i) Legal provisions to ensure that sludge reuse does not pose a risk to human health (e.g., existence of national standards for reuse of sludge and wastewater);
- (ii) Enforcement (regular inspection, penalties for non-compliance with the obligations);

(b) Issues of reliable information:

- (i) Regular monitoring of sludge quality before reuse to make sure that it does not pose a risk to human health (procedural requirements, limit values for toxic metals and pathogens, mainly *E. coli* (and for helminth based on local health targets, where appropriate));

(c) Adequate management of sludge:

- (i) Adequate treatment mechanisms for drying sludge (e.g., drying beds, mechanical dewatering);
- (ii) Sustainable reuse of sufficiently treated sludge;

(d) Awareness-raising, education and training:

- (i) Training of staff dealing with sludge in treatment facilities and possibly agriculture.

C. Relevant global and regional obligations and reporting systems

Eurostat and EEA collect data on total sewage sludge production from urban wastewater, reuse of sludge for agriculture, composting, landfill, incineration and other methods of disposal.

EU Urban Wastewater Treatment Directive 91/271/EEC stipulates that sludge arising from wastewater treatment shall be re-used whenever appropriate. Disposal routes shall minimize the adverse effects on the environment and competent authorities shall ensure that the disposal of sludge from urban wastewater treatment plants is subject to general rules or registration or authorization.

European Council Directive 86/278/EEC on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture regulates the use of sewage sludge in agriculture in such a way that contamination of soil and pollution of water does not occur from metal contaminants, nitrates and phosphates.

18 See Directive 2006/11/EC on pollution caused by certain dangerous substances discharged into aquatic environment of the Community, Decision No. 2455/2001/EC establishing the list of priority substances in the field of water policy

19 See http://www.who.int/water_sanitation_health/wastewater/gsuww/en/index.html

XIII. QUALITY OF WASTEWATER USED FOR IRRIGATION PURPOSES (ART. 6, PARA. 2 (i), second part)

A. Background rationale

The second part of article 6, paragraph 2 (i), of the Protocol requires the setting of targets and target dates related to the quality of wastewater used for irrigation purposes, taking into account the WHO/UNEP/FAO Guidelines for the safe use of wastewater and excreta in agriculture and aquaculture.[20]

Not all countries have developed detailed national legislation on the re-use of treated wastewater. One reference would be the WHO/UNEP/FAO Guidelines.

The Guidelines define verification as the application of methods, procedures, tests and other evaluations, in addition to those used in operational monitoring, to determine compliance with the system design parameters and/or whether the system meets specified requirements (e.g. microbial water-quality testing for *E. coli* or helminth eggs, microbial or chemical analysis of irrigated crops) (see Guidelines, vol. 1, p. 32). The Guidelines describe the minimum verification monitoring recommended to assess microbial performance targets for wastewater and excreta use in agriculture and aquaculture under conditions of urban and rural application of wastewater.

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) Local systems of irrigation and the types of water sources (surface water, groundwater, wastewater, liquid excreta) used for irrigation in practice;

(b) Legally based measures for wastewater management;

(c) Legally based requirements on water quality (qualitative standards) used for irrigation and conditions of its use;

(d) Legally based requirements for food product safety (both microbiological and chemical parameters);

(e) The system of monitoring of irrigation water;

(f) Rules for planning, designing and operation of irrigation systems supporting good agriculture practice;

(g) Enforcement and effective application of legal requirements or good agriculture practice of irrigation;

(h) Central availability of monitoring data on non-compliance with existing standards (if any);

(i) Issues of environmental protection and sustainability regarding use of water resources for irrigation purposes.

C. Relevant regional or global obligations and recommendations on reporting

The WHO Guidelines recommend the following minimum verification monitoring of microbial performance targets for wastewater and excreta use in agriculture and aquaculture:

Table 5: Recommended minimum verification monitoring of microbial performance targets for wastewater and excreta use in agriculture and aquaculture

Activity/exposure	Water quality monitoring* parameters	
Agriculture	*E. coli* per 100 ml** (arithmetic mean)	Helminth eggs per litre** (arithmetic mean)
Unrestricted irrigation		
Root crops	$\leq 10^3$	≤ 1
Leaf crops	$\leq 10^4$	
Drip irrigation, high-growing crops	$\leq 10^5$	
Restricted irrigation		
Labour-intensive, high-contact agriculture	$\leq 10^4$	≤ 1
Highly mechanized agriculture	$\leq 10^5$	
Septic tank	$\leq 10^6$	
Aquaculture	*E. coli* per 100 ml (arithmetic mean)	Viable trematode eggs per litre**

20 See the Guidelines for the Safe Use of Wastewater, Excreta and Greywater, http://www.who.int/water_sanitation_health/wastewater/gsuww/en/index.html

Activity/exposure	Water quality monitoring* parameters	
Produce consumers		
Pond	$\leq 10^4$	Not detected
Wastewater	$\leq 10^5$	Not detected
Excreta	$\leq 10^6$	Not detected
Workers, local communities		
Pond	$\leq 10^3$	No viable trematode eggs
Wastewater	$\leq 10^4$	No viable trematode eggs
Excreta	$\leq 10^5$	No viable trematode eggs

Notes

* Monitoring should be conducted at the point of use or the point of effluent discharge. Frequency of monitoring is as follows:

(i) Urban areas: one sample every two weeks for *E. coli* and one sample per month for helminth eggs;

(ii) Rural areas: one sample every month for *E. coli* and one sample every 1–2 months for helminth eggs;

Five-litre composite samples are required for helminth eggs prepared from grab samples taken six times per day. Monitoring for trematode eggs is difficult due to lack of standardized procedures. The inactivation of trematode eggs should be evaluated as part of the validation of the system.

** For excreta, weights may be used instead of volumes, depending on the type of excreta: 100 ml of wastewater is equivalent to 1–4 g of total solids; 1 litre = 10–40 g of total solids. The required *E. coli* or helminth numbers would be the same per unit of weight.

In line with the approach taken above, possible indicators include:

(a) Lack of compliance with the relevant parameter;

(b) Where appropriate, the concentration of viable helminth or trematode eggs per litre depending on the type of agricultural product grown (e.g., root crops, leaf crops, drip irrigation of high-growing crops) and the type of irrigation applied (e.g., labour-intensive, high-contact agriculture, (highly) mechanized agriculture).

Clearly, the selection of the individual indicators will depend to a great extent on the type of agriculture used at the national and even at the local level, and on the national legislation.

XIV. QUALITY OF WATERS WHICH ARE USED AS SOURCES FOR DRINKING WATER (ART. 6, PARA. 2 (j), first part)

A. Background rationale

The first part of article 6, paragraph 2 (j), of the Protocol requires the setting of targets and target dates related to the quality of waters used as sources for drinking water. Raw water quality is the key factor to ensure drinking water safety as protection of the source represents the first and basic barrier in a multi-barrier approach. Protection of raw water sources should be considered important, since:

(a) Prevention of pollution is often cheaper and easier than treatment;

(b) Even advanced treatment technology does not necessarily ensure 100 per cent safety for drinking water, as there is always a risk of failure in the treatment process.

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

(i) Legally based measures for the protection of waters used as sources for drinking water (water protection zones);

(ii) Enforcement and effective application of legal requirements on source water protection;

(b) Issues of management:

(i) Qualitative standards for raw water quality and its monitoring;

(ii) Online monitoring of raw (especially surface) water quality, i.e., capability to respond effectively to abnormal changes in raw water quality;

(iii) Treatment technologies applied according to local raw water quality (e.g., if it is not possible to comply with given quality standards, it may be feasible to include additional technological steps to continuously meet standards for human health protection);

(c) The availability and reliability of information:

(i) Central availability of data on non-compliance with existing standards (for raw water quality);

(ii) A composite index like the cost of the treatment of a unit volume of treated (surface or ground) water (at constant energy costs).

C. Relevant regional and global obligations and reporting systems

According to EU Water Framework Directive 2000/60/EC, EU member States shall identify, within each river basin district, all waters used for the abstraction of drinking water and bodies of water intended for such future use (art. 7, para. 1), and establish, in the absence of relevant measures adopted at EU level within six years after the Directive entered into force, environmental quality standards for substances on the priority list of substances (see Decision 2455/2001/EC) for all such surface waters and controls on the principal sources of these substances, and for all subsequent substances included on such list, in the absence of action at the EU level, five years after their inclusion on such list.

According to EU Groundwater Directive 2006/118/EC, measures to prevent and control groundwater pollution should be adopted, including criteria for assessing good groundwater chemical status and criteria, for the identification of significant and sustained upward trends and for the definition of starting points for trend reversals. The Directive includes standards for nitrates and pesticides.

Box 15: Examples of targets in relation to quality of waters used as sources for drinking water

Czech Republic

To comply with requirements of the EU Directive concerning the quality required of surface water intended for the abstraction of drinking water in EU Member States (75/440/EEC) and its emission standards (characteristics).

To fulfill requirements of Directive 2000/60/EC, establishing a framework for EU member State action in the field of water policy concerning achievement of good water status.

XV. QUALITY OF WATERS USED FOR BATHING (ART. 6, PARA. 2 (j), second part)

A. Background rationale

The second part of article 6, paragraph 2 (j), of the Protocol requires the setting of targets and target dates related to the quality of waters used for bathing. Bathing waters differ significantly from country to country. Thus, each Government should classify its bathing waters (inland and coastal waters) and set standards for the different categories.

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

(i) Legal provisions relating to the management of waters used for bathing:

a. Assignment of responsibilities;

b. Quality requirements;

c. Monitoring requirements;

d. Protection of surface waters used for recreation;

e. Provisions for the handling of conflicts of interest;

f. Remediation measures;

(ii) Enforcement (ability of a competent authority to exert control over bathing water quality status);

(iii) Provisions for transitional problems and emergency situations;

(b) Issues of availability and reliability of information:

(i) Availability of information on the quality of bathing waters:

a. Laboratory system capable of monitoring bathing water quality;

b. Data transfer and treatment mechanisms for surveillance;

(ii) Quality assurance system in laboratories;

(c) Issues of quality:

(i) Assessment of bathing water quality status;

(ii) Health effects surveillance linked to recreational water use;

(d) Issues of economic capacity:

(i) Financial capacity to comply with management responsibilities;

(ii) Provision of financial instruments to assist bathing water management actions;

(e) Awareness-raising, education, training:

(i) Provisions for upgrading the understanding of those obliged to conduct bathing waters management;

(ii) Provisions for public information and awareness;

(iii) Provisions for the involvement of the public in decisions related to bathing waters management.

C. Relevant regional or global obligations and recommendations on reporting

A combination of the WHO Guidelines for safe recreational water environments[21] and EU Bathing Water Directives 76/160 and 2006/7/EEC and limit values is recommended. When needed, recommended parameters may go further than the EU legislation, for instance as promoted by Blue Flag,[22] since clean bathing waters are important for the development of tourism and high bathing quality standards provide an incentive for treating wastewater, e.g., in coastal areas.

Possible indicators include:

(a) Bathing waters where *E. coli* and intestinal *Enterococci* values over a specified limit value occur or test results exceed it during a season. No limit value with this aim is currently specified by the new Bathing Water Directive 2006/7/EEC, but the composite limit value for the assessment of several test results throughout several seasons may be applicable. Thus the indicator can be:

(i) The number of freshwater samples (designated for bathing) with either *E. coli* counts exceeding 1000/100 ml or intestinal *Enterococcus* counts exceeding 400/100 ml in per cent of the total number of samples; or

(ii) The number of coastal/transitional water samples (designated for bathing) with either *E. coli* counts exceeding 500/100 ml or intestinal *Enterococcus* counts exceeding 200/100 ml in per cent of the total number of samples; or

(iii) The same, but on the basis of bathing waters where the above limits are exceeded throughout any one season;

(b) This is the approach with the closest conformity with the existing WatSan_S1 indicator; however, the limit value can be subject to further considerations (see also below);

(c) Number of designated bathing locations and percentage of bathing waters under control monitoring is an indicator option currently being developed by the WHO working group for ENHIS. The only difficulty here is the problem of gathering accurate data about the uncontrolled waters frequented by "wild bathers". This, however, is a clearly health-related concern, and the indicator should thus be encouraged;

(d) The new assessment scheme of the new EU Bathing Water Directive 2006/7/EEC, which should be implemented by 2015, is based on a compound statistical measure of the water quality of each of the bathing waters. Targets and indicators bound to this scheme are plausible for EU Member States, but may seem too "artificial" and laborious to follow for others. Therefore, the above-mentioned, more direct indicators may be preferred with the advantage that EU member States that use the assessment scheme of the Directive can also easily infer the data needed for it;

(e) Number of bathing waters covered by Blue Flag or other nationally or internationally accepted award schemes also addressing the quality of the water;

(f) One way in which potential hazards can be brought together on a location-specific basis is through the development of a recreational water safety plan. This includes a programme for monitoring and assessment as well as a management plan. WHO suggests that such a safety

21 See http://www.who.int/water_sanitation_health/bathing/en/

22 See www.blueflag.org.

plan be adapted from a country or regionally specific generic plan, which could include a hazard rating scheme and an overall recreational water rating. The advantage of adapting a generic plan is that all recreational water areas in a specific area are rated against the same scale, thus allowing national action;

(g) An upcoming indicator can be the number of bathing waters for which a bathing water profile is publicly available. Displaying bathing water profiles is an obligation for EU member States by the 2011 season. The system would be a worthwhile one to follow also for non-EU States.

The WHO Guidelines[23] provide the following guideline values for microbial quality of recreational waters:

Table 6: Guideline values for microbial quality of recreational waters

Ninety-fifth percentile value of intestinal enterococci/100 ml (rounded values)	Basis of derivation	Estimated risk per exposure
≤ 40 A	This range is below the NOAEL in most epidemiological studies	<1 per cent GI illness risk < 0.3 per cent AFRI risk The upper ninety-fifth percentile value of 40/100 ml relates to an average probability of less than one case of gastroenteritis in every 100 exposures. The AFRI burden would be negligible
41–200 B	The 200/100 ml value is above the threshold of illness transmission reported in most epidemiological studies that have attempted to define a NOAEL or LOAEL for GI illness and AFRI	1–5 per cent illness risk 0.3–1.9 per cent AFRI risk The upper ninety-fifth percentile value of 200/200ml relates to an average probability of one case of GI in 20 exposures. The AFRI illness rate at this upper value would be less than 19 per 1,000 exposures, or less than approximately 1 in 50 exposures
201–500 C	This range represents a substantial elevation in the probability of all adverse health outcomes for which dose-response data are available	5–10 per cent GI illness risk 1.9–3.9 per cent AFRI risk This range of ninety-fifth percentile values represents a probability of 1 in 10 to 1 in 20 of gastroenteritis for a single exposure. Exposures in this category also suggest a risk of AFRI in the range of 19–39 per 1,000 exposures, or a range of approximately 1 in 50 to 1 in 25 exposures
> 500 D	Above this level, there may be a significant risk of high levels of minor illness transmissions	> 10% GI illness risk >AFRI risk There is a greater than 10% chance of gastroenteritis per single exposure. The AFRI illness rate at the ninety-fifth percentile point of >500/100ml would be greater than 39 per 1,000 exposures, or greater than approximately 1 in 25 exposures

Notes: Abbreviations used: A–D are the corresponding microbial water quality assessment categories used as part of the classification procedure. AFRI = acute febrile respiratory illness; GI = gastrointestinal; LOAEL = lowest-observed-adverse-effect level; NOAEL = no observed adverse effect level. For other notes, please refer to the original literature.

23 WHO, Guidelines for safe recreational water environments, vol. 1 Coastal and Fresh water (Geneva, WHO, 2003), p. 70.

The new EU Bathing Water Directive[24] provides the following values for microbial quality of bathing waters:

Table 7: Values for microbial quality of bathing waters for inland waters

	A	B	C	D	E
	Parameter	Excellent quality	Good quality	Sufficient	Reference method or analysis
1	Intestinal *enterococci* (cfu/100 ml)	200 (*)	400 (*)	330 (**)	ISO 7899–1 or ISO 7899–2
2	*Escherichia coli* (cfu/100 ml)	500(*)	1 000 (*)	900(**)	ISO 9308–3 or ISO 9308–1

(*) Based upon a 95-percentile evaluation.

(**) Based upon a 90-percentile evaluation.

Table 8: Values for microbial quality of bathing waters for coastal waters and transitional waters

	A	B	C	D	E
	Parameter	Excellent quality	Good quality	Sufficient	Reference method or analysis
1	Intestinal enterococci (cfu/100 ml)	100 (*)	200 (*)	185 (**)	ISO 7899–1 or ISO 7899–2
2	Escherichia coli (cfu/100 ml)	250 (*)	500 (*)	500 (**)	ISO 9308–3 or ISO 9308–1

(*) Based upon a 95-percentile evaluation.

(**) Based upon a 90-percentile evaluation.

While the old Directive required regular monitoring of 19 pollutants or other parameters (e.g., water colour), the new Directive has reduced the list to just two microbiological indicators of faecal contamination, *E. coli* and intestinal *Enterococci*. It applies to surface water where a large number of people are expected to bathe, establishing a method for monitoring bathing water quality during the bathing season. The classification of water quality at a bathing site is determined on the basis of a four- or three-year trend instead of a single year's result as at present.

A relevant indicator is the Watsan_S1 Recreational Water Quality indicators collected through ENHIS.

The new EU Bathing Water Directive requires EU member States to provide the European Commission with the results of their monitoring and with the bathing water quality assessment for each bathing water, as well as with a description of significant management measures taken. The Commission now publishes an annual summary report on bathing water quality in the EU, including bathing water classifications, conformity with the Directive and significant management measures undertaken.

EU Bathing Water Directive 2006/7/EEC also requires elaboration of bathing water profiles for all designated bathing waters. The profile consists of a description of the bathing water; identification and assessment of causes of pollution; assessment of potential for proliferation of cyanobacteria, macroalgae and phytoplankton; and, in case of any risks, management measures to be taken. The profile must be reviewed at regular intervals depending on the water quality.

24 Directive 2006/7/EEC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC.

Box 16. Example for targets related to quality of waters used as bathing water

Czech Republic:

To meet the requirements of EU directives governing the quality of bathing waters and their characteristics .To assign bathing water profiles to the established bathing areas (in line with Article 6 of Directive 2006/7/EC) which characterize the given location, and identify the risks of pollution, including corrective measures

XVI. QUALITY OF WATERS USED FOR AQUACULTURE OR FOR THE PRODUCTION OR HARVESTING OF SHELLFISH (ART. 6, PARA. 2 (j), third part)

A. Background rationale

The third part of article 6, paragraph 2 (j), of the Protocol requires the setting of targets and target dates related to the quality of waters used for aquaculture or for the production or harvesting of shellfish. According to FAO, aquaculture is defined as "the farming of aquatic organisms: fish, mollusca, crustaceans, aquatic plants, crocodiles, alligators, turtles and amphibians. Farming implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding, production from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated. [...]".[25]

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

- (i) Existing regulations either purposely designed to protect/allow aquaculture or provisions on aquaculture incorporated into existing legislation;
  - a. The purpose of the industry (e.g., the market — local or export, employment, sport, recreation);
  - b. The system for production (e.g., pond, cage, tank, open water);
  - c. The environment in which production is done (e.g., lowland inland plains; costal swamplands; lakes/reservoirs, along river/streams), along irrigation systems;
- (ii) Effective implementation of legislation.

(b) Issues of management:

- (i) The monitoring system (site-specific), addressing water quality concerns and providing adequate baseline and operational data;
- (ii) The development and application of simple, practical "early warning" indicators addressing detrimental changes to phytoplankton and zooplankton;
- (iii) The development of best management practices for aquaculture operations, including risk-benefit analysis;
- (iv) The impacts of aquaculture on downstream water quality, including organic pollution and eutrophication, as well as water pollution caused by drugs and chemicals used in aquaculture, as some chemicals such as antibiotics and fungicides pose a potential danger to human health;
- (v) The development and application of simple models to estimate carrying capacity and predict site suitability for aquaculture operations;
- (vi) The impacts of caged aquaculture operations on structure and function of the fishery and biodiversity; and comprehensive fish disease management.

C. Relevant regional or global obligations and recommendations on reporting

Possible indicators in this area include:

(a) The existence of targets and parameters for waters used for aquaculture or for the production or harvesting of fish, shellfish, crustaceans and aquatic plants, including physical, biological and chemical parameters and quality parameters of waste waters resulting from aquaculture processes;

(b) Compliance with the existing standards.

EU Shellfish Directive 79/923/EEC requires that certain substances are monitored in the water in which shellfish live and grow. These substances can threaten the survival of shellfish, inhibit their growth

25 CWP Handbook of Fishery Statistical Standards Section J: Aquaculture. Available online at: http://www.fao.org/fishery/cwp/handbook/J/en.

or make them too expensive to treat before they can be used as a food source. For each substance, the Directive specifies the minimum number of samples to be taken and the percentage of samples that must meet these standards. The EU Freshwater Fish Directive (2006/44/EC) seeks to protect those freshwater bodies identified by member States as waters suitable for sustaining fish populations. It sets physical and chemical water quality objectives for salmonid waters and cyprinid waters. Both directives could be used for setting targets in the area of aquaculture.

XVII. APPLICATION OF RECOGNIZED GOOD PRACTICE TO THE MANAGEMENT OF ENCLOSED WATERS[26] GENERALLY AVAILABLE FOR BATHING (ART. 6, PARA. 2 (k))

A. Background rationale

Article 6, paragraph 2 (k), of the Protocol requires the setting of targets and target dates related to the application of recognized good practice to the management of enclosed waters generally available for bathing. If not managed properly, enclosed waters can represent significant risks, including microbiological and chemical contamination. The WHO *Guidelines for Safe Recreational Water Environments*[27] include a number of good practice principles and recommendations, but no quantitative parameters.

Public pools and spas are generally required to be equipped with water treatment and disinfection appliances in order to ensure an acceptable, low risk of infections transmitted via the water. This requirement is clearly subject to resources available for health promotion in less developed countries. Pools operated with water of recognized medicinal composition can be exempted, as the treatment and disinfection may damage the effect. In this case, however, the water exchange, user frequency, bathing duration and other operational parameters should be under strict control and use should generally be limited for patients with a medical condition.

Public pools without regard to their type should be managed by personnel with approved education and training, and management practice should be subject to regular control by health or other competent authorities. A key aspect of this control is the water quality, which should be checked by an accredited or otherwise notified laboratory in addition to the pool-side checks done by the operator.

A desirable achievement would be to have the public pools operated under a certified risk-based management system (e.g., a pool safety plan-based system). This might be subject of an extended target for the future.

Box 17. Progress in setting Protocol targets in the Republic of Moldova and Ukraine

Ukraine became a Party to the Protocol on 26 September 2003. The Republic of Moldova became a Party on 15 December 2005.

As of August 2010, neither the Republic of Moldova nor Ukraine had set targets in accordance with article 6 of the Protocol. However, in both countries the process of target setting was ongoing, supported by projects under the Project Facilitation Mechanism, established under article 14 of the Protocol.

In Ukraine, the Ministry of Environment Protection is the main coordinator of the activities related to the implementation of the Protocol. In 2008 the State Ecological Academy of Post-Graduate Education of Ukraine was assigned to analyse the country situation with respect to setting targets and target dates in accordance with the Protocol. The target-setting process is implemented with the assistance of a project financed by Norway since 2009. The project also includes a pilot activity on the implementation of the EU Water Framework Directive, illustrating its synergy with the Protocol. The project is coordinated by a steering group and a stakeholder group consisting of representatives of the relevant ministries, academia and NGOs. During 2009 and 2010, working documents, including draft targets, were drawn up. For each thematic area draft targets included legal aspects and targets related to a theme. Additional input was provided through consultations with regional institutions and NGOs. Data for the baseline analysis was gathered from 24 regions. A Web tool for data collection was also under consideration. The targets are expected to be finalized by end of 2010.

In the Republic of Moldova, appropriate tools for integrated water resources management that meet the requirements of the Protocol have recently been approved or are under development. They include the following: (a) water-related policies, strategies, plans and legislation; (b) institutional frameworks conducive to the implementation of the policies, strategies and legislation; (c) management instruments required by the institutional framework to carry out the institutions' tasks; and (d) capacity-building, awareness-raising and stakeholder information and consultations. Management instruments will be improved, as rules for the protection of surface waters and rules for the delineation of water bodies

26 According to article 2 of the Protocol, "enclosed waters" means artificially created water bodies separated from surface freshwater or coastal water, whether within or outside of a building.

27 See http://www.who.int/water_sanitation_health/bathing/bathing2/en/.

according to the Water Framework Directive are expected to be submitted to Government in the course of 2010. Moreover, a new system for water quality classification has been jointly developed by Moldovan water management and health authorities under an EU/Technical Aid to the Commonwealth of Independent States (TACIS) project, which is expected to be adopted by the Government in the course of 2010.

Target setting according to the Protocol, supported by a project financed by Switzerland, is a joint responsibility of the Ministry of Environment and the Ministry of Health. A high-level steering committee with multi-stakeholder representation was created to oversee the target-setting project and a national stakeholder meeting was held to inform and engage all relevant water and health institutions, NGOs and the general public. The final targets are expected to be submitted to the Government in October 2010 for approval.

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:
  - (i) Legal provisions relating to public enclosed recreational water (pool and spa) establishments;
  - (ii) Design and construction permitting;
  - (iii) Licensing of procedures and materials for water treatment and disinfection;
  - (iv) Rules of water use and bather load;
  - (v) Quality requirements;
  - (vi) Monitoring requirements;

(b) Enforcement (ability of a competent authority to exert control over pool and spa operation):
  - (i) Legal provisions relating to private pools;
  - (ii) Commercial (retail) permits;
  - (iii) Licensing of water treatment and disinfection chemicals;

(c) Issues of availability and reliability of information:
  - (i) Availability of information on the quality of public pool and spa waters;
  - (ii) Laboratory systems capable of monitoring;
  - (iii) Data availability for surveillance;
  - (iv) Quality assurance system in laboratories;

(d) Issues of quality:
  - (i) Assessment of facility characteristics relevant for the prevention of physical accidents;
  - (ii) Assessment of water quality with regard to the health risks of the use of pool and spa facilities;
  - (iii) Health effects surveillance linked to the use of public pool and spa facilities;

(e) Awareness-raising, education, training:
  - (i) Provisions for upgrading the competence of pool and spa designers and operators;
  - (ii) Provisions for assistance to the public in avoiding adverse health effects related to private pool use;
  - (iii) Provisions for public information and awareness with regard to rules and notices of user behaviour in public facilities.

C. Relevant global and regional obligations and reporting systems

Possible indicators in this area include:

(a) The existence of national standards for enclosed bathing waters;

(b) Cases of non-compliance with national targets and standards and/or good practices for enclosed waters generally available for bathing, for example:
  - (i) Appropriate treatment, including filtration;
  - (ii) Proper application of chlorine or other disinfectants;
  - (iii) Daily thorough cleaning;
  - (iv) Good ventilation;
  - (v) Complete draining and cleaning of the hot tub and pipework at least weekly;

(c) The number of public pools (including spa pools and all other types covered by the WHO Guidelines) equipped with approved water recirculation, treatment and disinfection appliances in percentage of the total number of public pools. Medicinal pools may be exempted only if the damage by the treatment to the chemical composition of the water with attributed medicinal effect is proven. Natural (non-enclosed) pools are also exempted and are subject to different requirements/regulations (if any);

(d) The number of public pools operated by management under the control of the competent authority acting on the basis of relevant legal instruments versus all public pools. The control should include the regular assessment of the quality of the water by the authority itself or by an accredited third-party laboratory and should extend to a minimum number of bacteriological, and possibly some chemical and physical, parameters;

(e) The number of public pools complying with the legal water quality (and possibly, management- and environment-related) requirements during any one-year period versus all public pools. A national system of compliance assessment should be available, otherwise a more simple but less comprehensive indicator would be the number of non-compliant test results per public pool per year;

(f) A composite indicator of the number of public pools operated in the framework of establishments equipped with an approved pool safety system versus all public pools could also be used.

XVIII. IDENTIFICATION AND REMEDIATION OF PARTICULARLY CONTAMINATED SITES (ART. 6, PARA. 2 (I))

A. Background rationale

Article 6, paragraph 2 (I), of the Protocol requires the setting of targets and target dates related to the identification and remediation of particularly contaminated sites that adversely affect waters within the scope of this Protocol or are likely to do so, and that thus threaten to give rise to water-related diseases.

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

(i) The legal framework for remediation of contaminated sites;

(ii) Enforcement (e.g., the ability of a competent authority to oversee and control contaminated sites);

(iii) Intervention capacity (e.g., the mechanisms available for the society/State to take remediation measures).

(b) The availability and reliability of information on contaminated sites:

(i) Inventory of contaminated sites;

(ii) Risk assessment of contaminated sites for surface and groundwaters (e.g., programmes to assist developing and transition economies in carrying out rapid environmental and health assessments);

(iii) Information on costs of remediation;

(c) Management and remediation of contaminated sites:

(i) Remediation action taken to reduce risk to human health through surface and groundwaters;

(ii) Action for specific contaminants (persistent organic pollutants);

(d) Economic aspects (investments made for remediation of contaminated sites);

(e) Awareness-raising, education and training:

(i) Public campaigns to raise awareness on contaminated sites;

(ii) Training of those responsible for remediation.

Box 18. Example of targets in relation to article 6 (l)

Czech Republic

Update the database of the "System of contaminated sites registers", including data on persistent organic pollutants. Perform consistent inventory of contaminated sites, including preliminary assessment of possible health or ecological risks. The assessment will be used for future risk analysis and assessment of necessity of decontamination measures, including the economic assessment of such measures.

Hungary

Remediation of 3.305 million m^3 contaminated soil and the recultivation of 1,500 dumping sites are to be accomplished by 2015. These targets are covered by the Government Decree on the protection of groundwaters and implemented by the National Programme on Environmental Remediation.

C. Relevant global and regional obligations and reporting systems

A relevant indicator measured by EEA is the "Progress in management of contaminated sites" (CSI 015).

The term "contaminated site" refers to a well-delimited area where the presence of soil contamination has been confirmed. The severity of the impacts to ecosystems and human health can be such that remediation is needed, specifically in relation to the current or planned use of the site. The remediation or clean-up of contaminated sites can result in the full elimination or in the reduction of these impacts. The indicator shows progress in four main steps: (a) preliminary study; (b) preliminary investigation; (c) main site investigation; and (d) implementation of risk reduction measures. Possible indicators could include:

(a) Number of sites managed/to be managed at different management steps;

(b) Percentage of sites where risk reduction measures are completed and where the need for remediation measures is estimated, as related to the estimated total number of sites to be identified by surveys;

(c) Expenditures are provided in millions of euros per capita per year and millions of euros per gross domestic product (GDP).

The Stockholm Convention on Persistent Organic Pollutants establishes lists of chemicals whose occurrence should be eliminated or restricted and sets out measures for how to achieve that. Each Party is required to develop an action plan incorporating those measures and, among others, strategies and measures to reduce or eliminate releases from stockpiles and wastes.

XIX. EFFECTIVENESS OF SYSTEMS FOR THE MANAGEMENT, DEVELOPMENT, PROTECTION AND USE OF WATER RESOURCES (ART. 6, PARA. 2 (m))

A. Background rationale

Article 6, paragraph 2 (m), of the Protocol requires the setting of targets and target dates related to the effectiveness of systems for the management, development, protection and use of water resources, including the application of recognized good practice to the control of pollution from sources of all kinds. In addition, according to article 6, paragraph 5 (b), Parties shall establish water management plans in transboundary, national and/or local contexts, preferably on the basis of catchment areas or groundwater aquifers. The public shall be involved.

In accordance with article 5 of the Protocol: (a) water resources shall be managed in a sustainable way (art. 5, para. (d)); (b) action to manage water resources should be taken at the lowest appropriate administrative level (article 5, para. (f)); (c) efficient use of water should be promoted through economic instruments and awareness-raising (art. 5, para. (h)); and (d) water resources should, as far as possible, be managed in an integrated manner on the basis of catchment areas, with the aims of linking social and economic development to the protection of natural ecosystems and of relating water resource management to regulatory measures concerning other environmental mediums. Such an integrated approach should apply across the whole of a catchment area, whether transboundary or not, including its associated coastal waters, the whole of a groundwater aquifer or the relevant parts of such a catchment area or groundwater aquifer (art. 5, para. (j)).

Moreover, article 13 of the Protocol encourages Parties to establish, with other Parties bordering the same transboundary waters, joint or coordinated water management plans.

Box 19. Improving the quality of water through changing agriculture management practices in protection zones and setting up compensation schemes, such as payments for ecosystem services[28]

Payments for ecosystem services (PES) entail a contractual transaction between a buyer and a seller for an ecosystem service or a land/use management practice likely to secure that service. There are many different ways for organizing PES. PES can generate additional alternative resources, redirect funds to environmentally friendly technologies and sustainable production patterns, create incentives for investment and increase private-sector involvement in environmental protection.

Intensive farming is often the main cause of ground and surface water pollution. Changing the management practices into low-intensity pasture systems, or organic farming, could reduce surface and groundwater pollution, improve the quality of water resources but also protect the water-related ecosystems.

There are examples of different private, public, or private-public PES schemes. In France, Vittel, a private water company, financed farmers to change their farming practices to reduce the risk of nitrate contamination.

In Germany, based on the provisions of the National Water Act, Federal states can establish special protection areas for water bodies (i.e. groundwater or reservoirs) that are used for drinking water supply. These areas typically have three zones with differing provisions on land use restrictions (i.e. use of fertilizers, handling of dangerous substances, petrol stations etc.). The water protection areas are established according to fixed procedures, including stakeholder participation. Federal states have established special ordinances regulating compensation procedures for farmers subject to land use restrictions; in many places, there are also direct contracts between water suppliers and farmers or local farming associations, respectively. In 2004, 13,428 water protection areas with a total land area of approximately 43,100 km^2 were established; this area corresponds to 12 % of the total land area of Germany.

B. List of issues to be considered for the process of target setting

In the target-setting process, the following aspects may be considered:

(a) The legal, institutional and administrative set-up:

- (i) The legal framework (e.g., at the national and transboundary levels, including permits, licensing and environmental impact assessment);
- (ii) The institutional framework (e.g., the existence and effectiveness of national authorities as well as joint bodies such as international river basin commissions, cooperation between authorities and decentralization of decision-making);
- (iii) Enforcement (e.g., the ability of a competent authority to oversee and control, compliance with permits, level of fines, payment of fines);
- (iv) Integration of water management issues in legal and policy instruments related to other sectors, such as agriculture, energy and industry;

(b) Availability and reliability of information:

- (i) Inventory of pressures, land use, emissions (e.g., pollutant release and transfer registers);
- (ii) Monitoring systems (on the basis of the river basin, including transboundary aspects);
- (iii) Data management and data exchange (e.g., between authorities, between riparian countries);
- (iv) Capacity to do assessment of ecological and chemical status and quantity aspects;
- (v) Cooperation at the transboundary level on monitoring and assessment;

(c) Status of water resources and related ecosystems:

- (i) Improving quality and quantity status (including ecological aspects), setting environmental targets;
- (ii) Protected areas;
- (iii) Biodiversity;

(d) Planning and implementation of water management measures:

- (i) Programme of measures based on assessment;
- (ii) Integrated water resources management (IWRM) plans;
- (iii) Application of good practices (e.g., agriculture practices) and best available techniques;
- (iv) Implementation of measures and monitoring of their effectiveness;
- (v) Cooperation at the transboundary level;

28 For further guidance on this issue, see http://www.unece.org/env/water/publications/documents/PES_Recommendations_web.pdf.

(e) Economic aspects:

(i) Economic valuation of water and related ecosystems;

(ii) Application of polluter pays principle, use of economic instruments to promote water efficiency and prevent pollution (e.g., water allocation and permits for use and fines);

(iii) Cost-benefit analysis of water management measures and cost recovery of water management measures;

(iv) Economic incentives (payments for ecosystem services);

(v) Resources made available for water management-related projects (from the national budget and international assistance);

(vi) Sharing costs and benefits at the transboundary level;

(f) Awareness-raising, education and training:

(i) Public participation in water management;

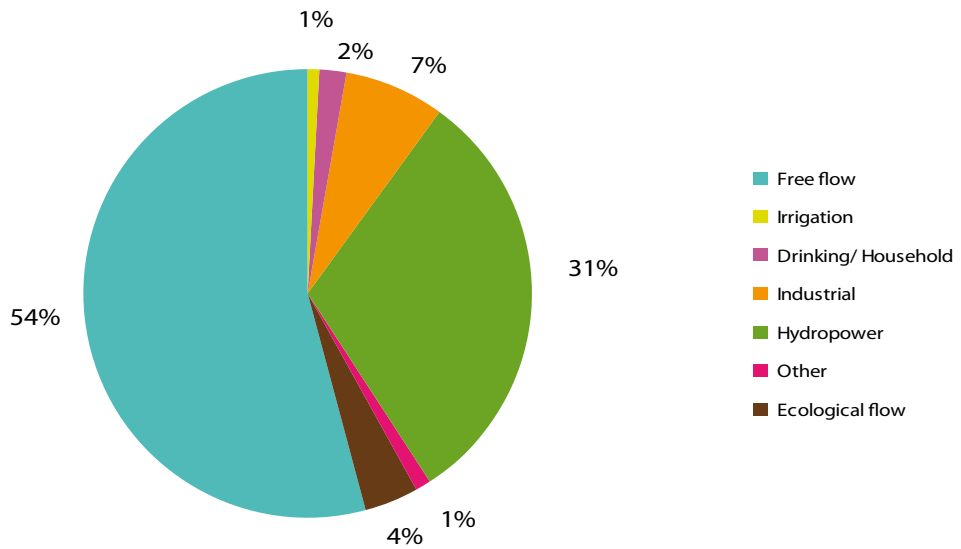
(ii) Campaigns to increase the awareness of the general public and stakeholders (farmers) to promote protection of water resources and sustainable practices;

(iii) Training of staff in competent authorities.

Box 20. Setting targets for sustainable water management: the Armenian approach in the Marmarik catchment area

The catchment area of the Marmarik River, a 37-km-long Armenian watercourse in the transboundary basin of the Kura-Araks, draining approximately 418 km^2, was chosen as a pilot area to apply the principles of the Convention and its Protocol on Water and Health, as well as the EU Water Framework Directive. The activities, under the leadership of the Armenian Water Resources Management Agency, were part of the National Policy Dialogue process conducted under the EU Water Initiative, had the UNECE as a strategic partner and were financed by the European Commission. In order to establish targets on sustainable water management, the process followed the major steps (i.e., the identification of key stakeholders, baseline analysis, prioritization of activities, broad consultations with the public, agreement on targets and development of the relevant programme of measures) as described in the present Guidelines. The baseline analysis revealed that, despite the relatively good water quality in the catchment area, the availability of water resources under the impact of climate change may decrease by over 20 per cent in 2030, which in turn would have a significant adverse effect on the existing water quality. The total annual river flow is 158 million m^3, of which the water abstraction (2009) is on the order of 69 million m^3.

Water abstraction by sector in the Marmarik in 2009



Despite this, the demand for irrigational water leads to a huge water deficit in the irrigation period in summer and the reservoir construction programme was largely contingent upon this fact. A cost estimate of the necessary legal, institutional and technical measures was made to maintain a good water quality status and achieve the desired conditions related to the quantity and quality of water supply. The estimate totalled US$ 12 million (around $1,500 per inhabitant).

In consultations involving residents and representatives of major water users and local self-governance authorities, the following 10 general targets related to sustainable water management — in order of priority — were drawn up:

(a) Development of a system for the strict protection of drinking and mineral water resources, as well as their efficient use;

(b) Expansion of the territory of the hydrological reserve and strengthening of the protection regime;

(c) Protection and development of water resources for recreational purposes;

(d) Development of hydropower production through the construction of small hydropower plants;

(e) Management and regulation of the river flow, including construction of reservoirs;

(f) Development of the irrigation system;

(g) Drawing up conditions for industrial water use and developing appropriate enforcement mechanisms;

(h) Introduction and development of a system for discharge and treatment of wastewater from point sources;

(i) Development of a system for prevention of water pollution from diffuse sources;

(j) Development of a system for the reduction and prevention of erosion.

These targets were further elaborated and supported by numerical values, including both targets and target dates. The financial analysis and affordability benchmarks showed that it was unrealistic to finance such a programme of measures and the programme of measures was revised to include only the priority measures required to achieve the desired conditions of water quantity and quality. Under the revised scenario, the total budget of the programme of measures amounted to US$ 3.6 million or around $470 per inhabitant.

C. Related common indicators

Parties have also agreed to include in their summary reports to the Meeting of the Parties information on the management, use and protection of freshwater resources by using the following common indicators.

1. Water quality

On the basis of national systems of water classifications, Parties will include the percentage of water falling into each defined class (e.g., into classes I, II, III, etc. for non-EU countries; for EU countries, the percentage of surface water bodies with high, good, moderate, poor or bad ecological status, the percentage of surface water bodies with good or poor chemical status and the percentage of groundwaters of good or poor quantitative and chemical status).

2. Water quantity

Parties will also provide water exploitation indices at the national and river basin levels for each sector (e.g., agriculture, industry, domestic). These will have the mean annual abstraction of freshwater by sector divided by the mean annual total renewable freshwater resource at the country level, expressed in percentage terms.

D. Relevant global and regional obligations and reporting systems

At the global level, periodical reporting is organized, for instance, within the United Nations Commission on Sustainable Development, to measure progress made towards the MDGs and the Johannesburg Plan of Implementation, in particular related to the target on establishing IWRM plans.

The EU Water Framework Directive requires submission of several reports: noteworthy are the reports on competent authorities (art.3), on analysis of river basin districts (art.5), on monitoring programmes (art.8), and on river basin management plans and programmes of measures (arts. 11 and 13).

Several transboundary agreements require assessment and reporting.

Other relevant directives include:

- Regulation (EC) No. 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EC and 96/61/EC;
- Directive 2008/1/EC concerning integrated pollution prevention and control, which is a codified version of Directive 96/61/EC;
- Directive 2006/11/EC on the pollution caused by certain dangerous substances discharged into the aquatic environment of the Community;
- Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources.

XX. FREQUENCY OF PUBLICATION OF INFORMATION ON THE QUALITY OF DRINKING WATER SUPPLIED AND ON OTHER WATERS RELEVANT TO THE PROTOCOL (ART. 6, PARA. 2 (n))

A. Background rationale

Countries shall set the frequency of the publication of information on the quality of the drinking water supplied and of other waters relevant to the targets set in the intervals between the publication of information on the collection and evaluation of data on the progress towards the targets. Such publication should take place at least every three years.

B. Relevant regional or global obligations and reporting systems

As established by the decision of the Meeting of the Parties, Parties to the Protocol shall publish at least every three years the results of data collection and evaluation in accordance with the requirements of article 7, paragraph 2. Similarly, in accordance with article 7, paragraph 4, of the Protocol, the Meeting of the Parties decided that Parties shall review progress made in achieving the targets every three years.

The reporting obligation frequency in relevant EU directives is as follows:

(a) Bathing Water Directive 76/160/EEC: reporting on an annual basis;

(b) Drinking Water Directive 98/83/EEC: each member State shall publish a report every three years on the quality of water intended for human consumption with the objective of informing consumers;

(c) Nitrate Directive 91/676/EEC: every four years;

(d) Urban Wastewater Treatment Directive 91/271/EEC: every two years.

Annex

EXAMPLES OF RELEVANT INTERNATIONAL OBLIGATIONS

United Nations Millennium Mevelopment Goals

United Nations Framework Convention on Climate Change

World Health Organization International Health Regulations

UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)

UNECE Convention on the Transboundary Effects of Industrial Accidents

UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes

The Stockholm Convention on Persistent Organic Pollutants

Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive)

Council Directive 98/83/EC on the quality of water intended for human consumption (Drinking Water Directive)

Council Directive 91/271/EEC concerning urban wastewater treatment

Directive 2006/113/EC of the European Parliament and of the Council on the quality required of shellfish waters

Directive 2006/7/EC of the European Parliament and of the Council concerning the management of bathing water quality and Council Directive 76/160/EEC concerning the quality of bathing water

Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration (Groundwater Directive)

Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources

Former Council Directive 75/440/EEC concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (repealed)

Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances and Directive 2003/105/EC of the European Parliament and of the Council amending Council Directive 96/82/EC

Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market and its successive amendments

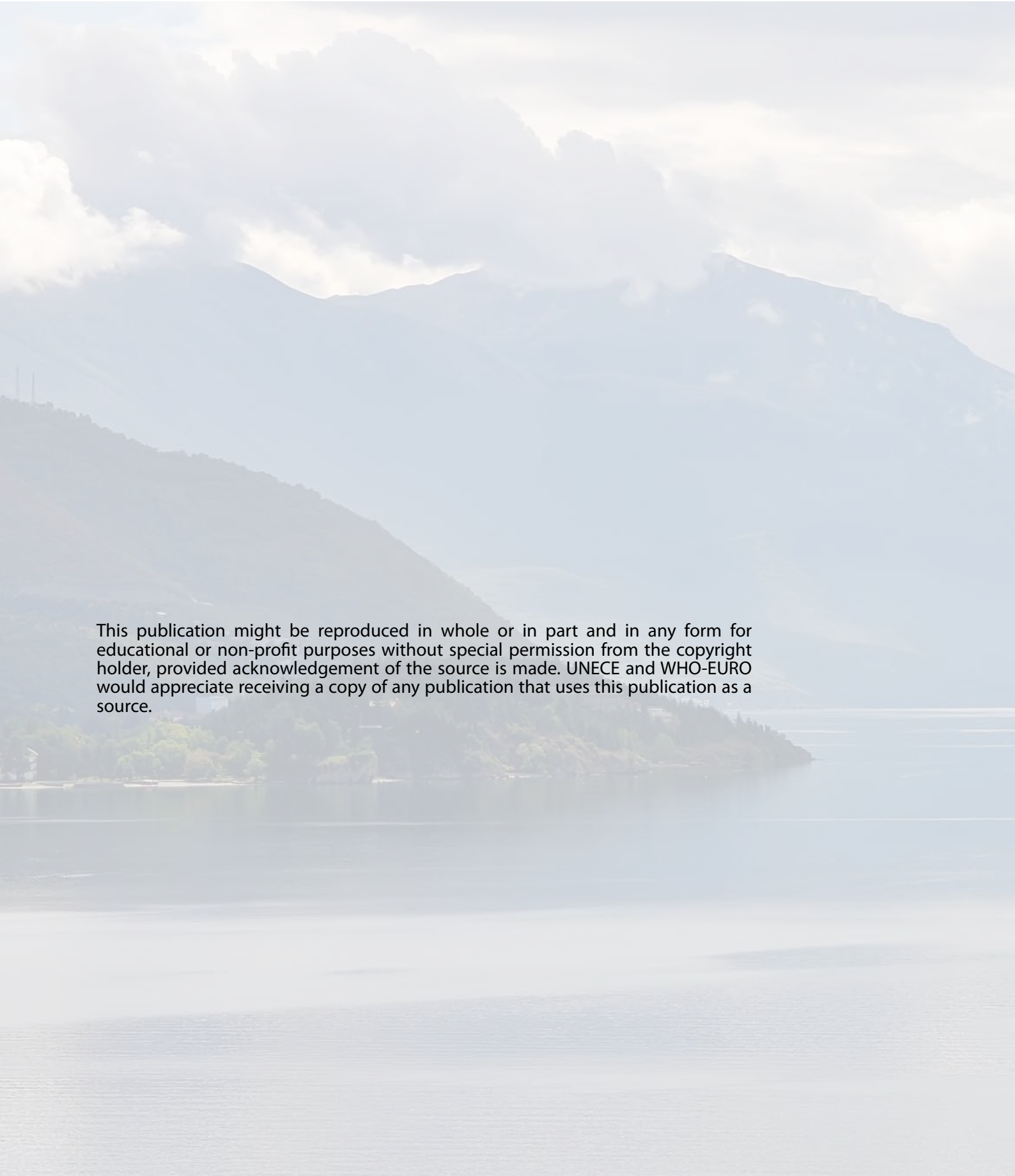
Directive 2006/11/EC on the pollution cased by certain dangerous substances discharged into the aquatic environment of the Community

Regulation (EC) No. 166/2006 concerning the establishment of an European Pollutant Release and Transfer Register and amending Council Directives 91/689/EC and 96/61/EC

Directive 2008/1/EC concerning integrated pollution prevention and control, which is the codified version of the Directive 96/61/EC

Bilateral and multilateral transboundary water agreements entered into by the Parties

Protocol on Pollutant Release and Transfer Registers to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Protocol on PRTRs)



Joint UNECE - WHO/EURO Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes

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GUIDELINES ON THE SETTING OF TARGETS, EVALUATION OF PROGRESS AND REPORTING

The Protocol on Water and Health, jointly serviced by the United Nations Economic Commission for Europe (UNECE) and the Regional Office for Europe of the World Health Organization (WHO-EURO), has been negotiated specifically to ensure, by linking water management and health issues, the supply of safe drinking water and adequate sanitation for everyone. Its main aim is to protect human health and well-being through preventing, controlling and reducing water-related diseases and through improving water management.

The Protocol recognizes the complexity of the water and health nexus and requires Parties to tackle problems at their roots in a rational and coordinated way. It compels Parties to set national and/or local targets and the dates to achieve them in areas covering the entire water cycle and the related health consequences, to develop measures to achieve such targets and to regularly assess progress. Setting targets and review and assessment of progress, as defined in Articles 6 and 7 of the Protocol, are the backbone for action to reach the Protocol's objectives.

The *Guidelines on the Setting of Targets, Evaluation of Progress and Reporting* are an important tool supporting this process. They illustrate the steps that need to be taken and the aspects to be considered when setting targets, implementing relevant measures and assessing and reporting on the progress achieved. The Guidelines are based on existing good practices and experience of the Protocol's Parties. They illustrate a variety of possible targets that can be set in accordance with the Protocol and provide a source of inspiration, information and assistance to Parties that are currently undergoing or will go through the process of target setting.

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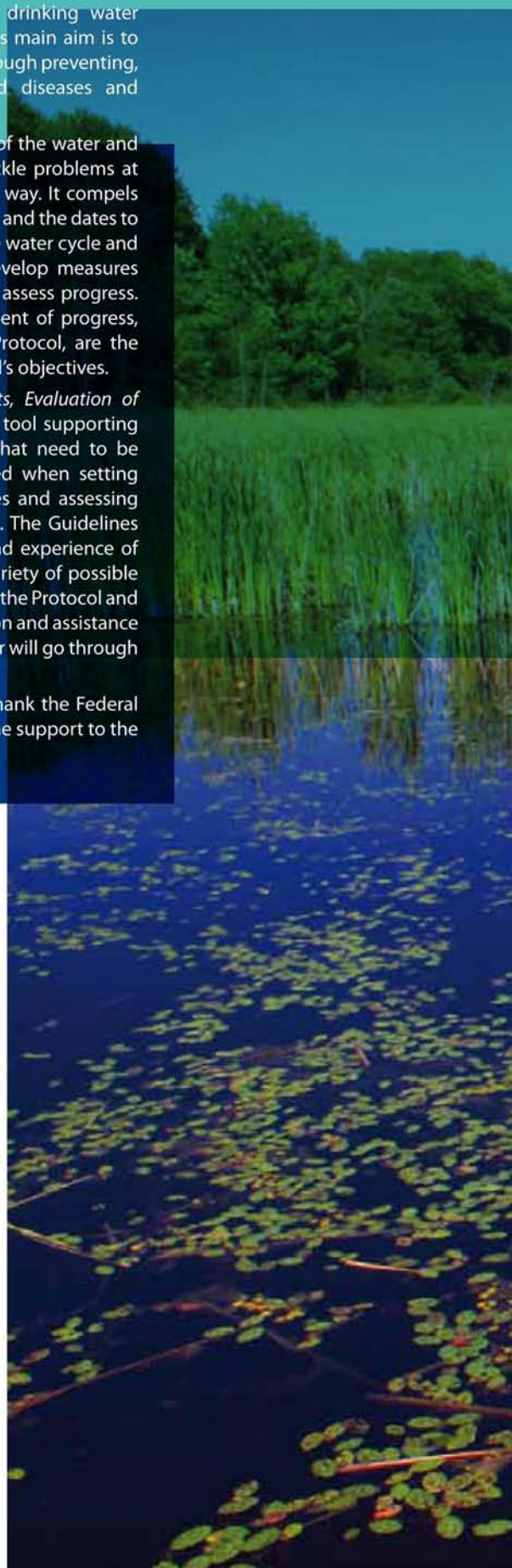

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