

PROJECT PROPOSAL

**SUPPORT TO THE INTRODUCTION OF ECOLOGICAL
MANAGEMENT OF WATER PROTECTION ZONES AS A FIRST STEP
TO THE INTRODUCTION OF WATER SAFETY PLANS IN SMALL
SCALE WATER SUPPLY SYSTEMS IN THE DUSHETI AND
MARNEULI DISTRICTS IN GEORGIA**

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1. Introduction

Significant proportions of the population of the European region live in rural areas where they are frequently dependent on small scale systems¹ for their daily water supply. Such systems have been shown to offer only a limited capacity to control environmental risks, and are associated with higher disease burdens in the resident population.² Protection of the catchment area, particularly the creation of effective water protection zones, is often a cost-effective way to increase compliance with the WHO Guidelines on Drinking-water Quality, and a first essential step towards the creation of a water safety plan (WSP). The scientific principles associated with the creation of water protection zones have been recognized by the legally-binding Protocol on Water and Health³, ratified by Germany in 2007.

The present document is a proposal by the national authorities of Georgia⁴ in which the water safety of small scale supplies, and the negative health outcomes associated therewith, has been identified as a priority concern. In particular it focuses on the creation and enforcement of water protection zones in the Dusheti and Marneuli districts with the aim of facilitating the introduction of water safety plans in the small scale water supply systems in this region thereby improving the health of the local population. To achieve this aim the authorities of Georgia are inviting international assistance to improve the current situation.

It is to be noted, that the so called *Biennial Collaborative Agreements (BCA)* between the WHO regional Office for Europe (WHO/EURO) and the government of Georgia for 2010-2011 was signed in May 2009 and includes the area of water and health.⁵

2. Georgia: health problems linked to lack of water supplies

3.1 Current water supply situation

Georgia is a comparatively small republic with a surface area of 69,700 km² and a total population of 4, 4 million people (2008)⁶. This largely mountainous country counts a large rural population, 48% of the Georgians live in rural areas accounting for 2,064,000 million people. Whereas 87% of the urban population benefits from water supply piped into the dwelling, only 38% of the rural population has water piped into the dwelling while 59% of the rural population makes with other improved sources of water (standpipes) and 3% remain dependent on unimproved water supply systems. Although the latest statistics can't indicate an exact number of people who gained access to improved sources of drinking water 1990-2008, it indicates a clear improvement in the

development and use of water supply pipe in rural areas, in 1990 only 19% got drinking water from such a source whereas in 2008 51% do. For the overall country, including urban areas, the improvement went from 53% to 73%.⁷

Drinking water being a powerful environmental determinant of health, it is primordial to ensure not only access to water supplies, but also the safety of drinking-water supplies. To achieve this aim, the World Health Organization (WHO) has recommended a holistic risk assessment and risk management approach to ensure safe drinking water. Such a holistic approach is called Water Safety Plan (WSP).

WSPs have not yet been introduced in Georgia; anecdotal evidence shows however that water-related diseases continue to cause a serious burden on the further development of the country.

3.2 National health outcomes

Georgia suffers from a high incidence of water-related diseases, with yearly outbreaks as shown in the table below

Table 2-1 Incidence and outbreak of infectious disease potentially linked to water

	Incidence		Number of outbreaks	
	Baseline (Year 2005)	Current value (Year 2008)	Baseline (Year 2005)	Current value (Year 2008)
Acute gastro-enteritis	7,431	10,901	4	2
Viral hepatitis A	889	888	6	0
Giardiasis	740	299	0	0
Bacillary dysentery (Shigellosis)	310	103	5	0

The incidence of water-related diseases in Georgia is higher than in other countries of the EUR-A region. Anecdotal evidence has demonstrated that the situation is usually worse in rural than in urban areas. Assessment of individual rural areas in Georgia confirms this pattern (see below).

3. Water Safety Plan: marrying environmental protection and health outcomes.

The general weaknesses of small scale water supply systems, and in particular the consequences of failing water protection zones was identified in the workshop on water safety in small scale systems in the European region (Bad Elster, Germany, 26 – 27 November 2008) organized with the support of the German Ministry of Environment and the Italian Higher Institute of Public Health (ISS).⁸ These outcomes were confirmed in several subregions in Georgia.

In the framework of the WECF ELA Georgia Project (2008)⁹ drinking-water quality has been assessed in some villages (Agdgomiant Kari, Dusheti, Misakieli, Natakhtary etc) of the Mtskheta-Mtianeti and Marneuli regions by the Georgian Environmental and Biological Monitoring Association (GEBMA). These districts are marked by community and individual settlements that are widely dispersed over considerable areas, and by high dependency on small scale and community water supplies. These areas are also touched by frequent outbreaks of water-related diseases, frequent use of (contaminated) groundwater without any prior disinfection, uncontrolled construction of pit latrines and shallow wells, leading to further contamination of groundwater and surface water reservoirs.

Analysis showed significant increase of nitrates¹⁰ in the samples taken from wells of the Dusheti and Marneuli districts. Moreover, the creeks used for irrigation were microbiologically highly contaminated. The cause of the nitrate contamination has not been determined unequivocally, although abandoned storage areas and fertilizers and agrochemicals, as well as uncontrolled dumping of human and animal wastes in the capture zone of exploited aquifers, are suspected of being at the origin of this contamination. It can be assumed that the lack of enforced protection zones in these areas has led to contamination of the resource water and consequently had health impact.

There is a clear need to assess the environmental hazards in the water catchment areas of the Dusheti and Marneuli districts, assess risks and verify current controls, and provide guidance to the Georgian authorities on how appropriate environmental management of the water protection zones could reduce the risk of contamination of the resource water and ultimately the drinking-water in a cost-effective and reliable manner.

Protection and sustainable management of resource water quality is an important component of any WSP. Its importance is particularly high in rural areas where the local population depends on small scale water supply systems. The restricted technical capacity for water treatment in small scale systems, the limited technical know-how of the owner/operators and the often deficient operation and maintenance of the distribution system make it imperative to take all possible measures to install environmental management principles. These principles would identify hazards and control risks to the

quality of the resource water destined for the production of drinking-water as far upstream as possible in the water supply chain. This particularly applies to the creation and enforcement of water protection zones (“wasserschutzgebiete”)¹¹.

The scientific guidance contained in the WHO Guidelines for Drinking-water Quality is translated into legal commitments through the Protocol on Water and Health and into an operational instrument through the Water Safety Plan. The Protocol on water and Health was the world’s first legally-binding instrument aimed at sustainable water resource management and reduction of water-related diseases. The Protocol on Water and Health was ratified by Germany on 15 January 2007 and signed by Georgia on 17 June 1999.

Parties to the Protocol on Water and Health recognize the general provision that they “shall [...] take all appropriate measures for the purpose of ensuring [...] the protection of water resources which are used as sources of drinking-water” (Art 4 §2 (a)) and in particular ensure

Effective protection of water resources used as sources of drinking-water, and their related water ecosystems, from pollution from other causes, [...] (Art 4 §2 (c))

Similarly, Parties subscribe to the principle that

Preventive action should be taken to [...] protect water resources used as sources of drinking-water because such action addresses the harm more efficiently and can be more cost-effective than remedial action (Art 5 (e))

Action to manage water resources should be taken at the lowest appropriate administrative level (Art 5 (f))

In line with these obligations, Parties to Protocol on Water and Health¹², organized the workshop on small scale water supply systems cited above. The discussion during the workshop and then the further development of the scientific evidence base by the Italian Higher Institute of Public Health, have shown that small scale water supply systems are indeed more prone to deliver water that does not meet the quality criteria of the WHO than the networked distribution systems commonly found in urban areas^{13,14}. Consequently, participants called for specific support for the installation of WSPs in small scale water supply systems.

Participants to the workshop saw WSPs as a viable approach to ensure safe drinking water for small-scale water supplies. However they also identified a number of challenges that need to be overcome if WSPs are to be implemented successfully in small scale water supply enterprises. Amongst these challenges are:

- The lack of adequate resource protection (zoning and enforcement).
- Development and enforcement of regulatory frameworks
- Handling of unavoidable breaches of protection zones

- Lack of awareness by the local population on the importance of sound environmental management to resource water quality
- Lack of diagnostic tools for identification of dangerous contamination (e.g. from *Cl. Perfringens*, *C. hominis* and *C. parvum*), which may be important in rural areas; the lack of local diagnostic capacity results in delays in receiving results from laboratory determinations, which may further delay action;

It is therefore clear that international actions aimed at supporting national efforts to strengthen environmental management of water resources, and in particular improvement of the protection of resources waters destined for the production of drinking-water through the creation and enforcement of water protection zones (“wasserschutzgebiete”), are an especially important component of WSPs in rural areas and are fully in line with the international obligations of the Parties to the Protocol on Water and Health.

4. Project goals and expected results

4.1. Overall project goal

The overall project goal is to implement demonstration projects in the Dusheti and Marneuli districts on the assessment of environmental risks and the effectiveness of the current control measures in small scale water systems, paying particular attention to health outcomes in the serviced population. Such assessments will form the basis for the development of proposals for sound environmental management of the catchment area, including the creation and enforcement of protected water catchment zones. Supporting measures such as training for local authorities, local key professional and technical staff, and general awareness raising of the resident population will further support these ecological measures¹⁵.

4.2. Detailed expected results

1. Detailed assessment of the current quality of resource water for the production of drinking-water and its negative health outcomes in small scale water supply systems in the Dusheti and Marneuli districts in Georgia, followed by ranking to determine the most affected areas in order to act.
2. Detailed review of the environmental hazards and risks that impact the quality of the resource water destined for the production of drinking-water by Georgian experts supported by international experts as needed.
3. Detailed review of current control measures employed in the small scale water supply systems and verification of their effectiveness to reduce the risk and bring

the quality of the water in line with the quality criteria of the WHO Guidelines for Drinking-water Quality.

4. Review of the current regulatory framework and enforcement mechanism for the establishment and enactment of water protection zones (wasserschutzgebiete), and recommendations for improvements.
5. Training programmes introducing the WSPs aimed at the national professionals from the environment and health sector, local authorities, and owners-operators of small scale water supply systems on the importance of reducing the environmental impact of activities situated inside a water protection zone for the safeguarding of resource water quality.
6. Awareness raising programme aimed at the local residents on the importance of installing and protecting water protection zones, and their contributing role in the success of such programmes.
7. Strengthening the health labs as required.

5. Project stages

5.1. *Preparatory stage*

1. *Establishment of a qualified, dedicated WSP team* from a wide group of stakeholders including land use planners / managers, representatives of the environmental protection agency or similar body mandated to regulate polluting facilities, representatives of the local health systems, farming organizations with land adjacent to catchment active in livestock raising and , representatives of industry water supply owner / operators, and representatives of the health sector, owners/operators of small scale water supply systems, .
2. *Preparatory scientific and technical activities* consisting of: collation and review of existing data and relevant scientific literature, preparation of laboratories including assessment of their capacity to determine all relevant pathogens, finalising of field questionnaires, development of electronic data entry forms, translation of the Water Safety Plan Manual into Georgian language. Conduct of communication activities for planned field work, in particular establishment of contacts between the WSP team and the local authorities in the Dusheti and Marneuli districts.
3. *Preparation of training and communication activities* on the importance of environmental management and protection of the water protection zones, one set

destined at the local authorities and one set destined at the local population and the local owner / operators of small scale water supply systems.

5.2. Field activities

4. *Sanitary inspection of the existing water protection zones and resource water quality* in the Dusheti and Marneuli districts using Georgian laboratories accredited in the analysis of soil, water and bottom sediments; sampling and quality assessment of drinking-water, assessment of the health outcomes in the serviced population using standing surveillance programmes strengthened with targeted questionnaires aimed at elucidating latent forms of disease and pre-nosological conditions that are not reported through the standardized mortality referral and hospitalization rates.
5. *Training workshop on water resource protection* zone establishment and management destined at the local authorities in the Dusheti and Marneuli districts
6. *Outreach programmes aimed at raising awareness of the local population* on the importance of water resource protection zones for their own health, and on their role, responsibilities and capacity in maintaining such zones.
7. *Strengthening national health laboratory to fulfil the coordinating functions, and empower local health services to participate in the field work.*

5.3. Analytical work

8. *Determination of priority regions for the demonstration projects.* Based on the outcome of the sanitary inspection, the assessment of the drinking-water quality and the resulting health outcomes in the local population, small scale water supply systems in the Dusheti and Marneuli districts will be ranked for priority intervention in terms of environmental protection of the water resources.
9. *Detailed description of the water system in the demonstration projects* For such priority water supply systems a detailed description of the water supply system will be developed. The description will pay special attention to the identification of current hazards in the catchment area and their risk to the quality of the resource water through sanitary surveys and other means, and to the quality of the existing legal framework for the protection of the catchment area and its enforcement. The following shall be points of special attention:
 - Relevant water quality standards and their relationship with the WHO Guidelines on Drinking-water Quality

- Origin of the resource water, including detailed description of the runoff and/or recharge processes, and, if applicable, alternative sources in case of incident.
 - Details of land use in the catchment, with special emphasis on industrial waste from active enterprises or historic waste dumps, on agricultural activities especially those involving the raising of livestock and the use of fertilizers and other agrochemicals including the management of their storage facilities, on disperse human settlements specifically on the use of improved sanitation facilities and the general safe disposal of human and barnyard animal excreta.
 - Review of the current legal framework for the management of land use patterns in water catchment areas.
 - Study of historical meteorological and health records to determine known or suspected recurrent changes in source water quality relating to meteorological or other conditions
10. ***Verification of the effectiveness of current control procedures.*** Based on the above risk assessment, current risk management procedures will be assessed and control measures taken by small scale water suppliers will be verified for their effectiveness in controlling such risks. Common causes of environmental contamination leading to non-compliance of the drinking-water quality with the WHO quality guidelines will be elucidated, and possible remedial action will be identified. A distinction will be made between risks that can be managed through appropriate environmental management of the catchment area, and risks for which intervention at the level of the drinking-water production unit remains indispensable.

5.4. Advisory functions

Advice will be formulated on

11. ***The legal framework*** establishing and enforcing water protection zones
12. ***The establishment of WSPs in small scale water supply systems***, particularly with regard to the establishment of appropriate WSP teams, the description of the water supply system, the identification of hazards and hazardous events in the water catchment areas and the assessment and management of associated risks, and the validation of existing control measures and the reassessment of risks and their controls particularly the identification of risks that can be controlled through appropriate environmental management of the catchment area.

13. *Lessons learned from the training of local authorities* and from the outreach programmes to the general public, for use in similar settings elsewhere in Georgia.
14. *The strengthening of the health sector* for the monitoring and assessment of health outcomes due to environmental contaminants of the resource water.

6. Eligibility of the proposal under the *ad hoc* Project Facilitation Mechanism

Parties to the Protocol on Water and Health adopted criteria for consideration of project proposals under the *ad hoc* Project Facilitation Mechanism (AHPFM) (see document ECE/MP.WH/AC.1/2008/3 EUR/5086361/7 of 29 April 2008)

The AHPFM covers the countries of the Eastern European, Caucasus and Central Asia (EECCA) region and the South Eastern European (SEE) region. Georgia fulfils the geographic criteria.

Parties will have first priority with regard to submitting projects for funding. Countries that are not yet Parties but are Signatories will be given priority over countries that have not signed the Protocol. Georgia is a Signatory to the Protocol on Water and Health.

Proposals need to address the provisions in Art 4 of the Protocol, and in particular support the achievement of: adequate supplies of wholesome drinking-water and adequate sanitation of a standard that sufficiently protects human health and the environment, effective protection of water resources used as sources of drinking-water and their related water ecosystems from pollution, effective systems for monitoring and responding to outbreaks or incidents of water-related diseases.

The proposal will form the basis for target setting in the area of safe water supply in rural areas, and strengthening surveillance, early-warning and response systems.

The project also supports the tenant of the Protocol that action with regard to the protection of water resources needs to be taken at the lowest possible administrative level, and demonstrates Government commitment by allocating funding and/or in-kind support. It also responds to the requirement that special consideration should be given to people who are particularly vulnerable to water-related diseases, including disadvantaged populations in rural areas.

7. Time frame

Month ->	1	2	3	4	5	6	7	8	9	10	11	12
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Preparatory stage																			
Establish the WSP team	■	■																	
Preparatory scientific activities		■	■	■															
Preparatory communication activities			■																
Field activities																			
Sanitary inspection				■	■	■	■	■	■	■									
Training of local authorities				■															
Outreach programme							■	■		■									
Analytical work																			
Ranking of water suppliers											■								
Detailed description of supply system												■	■	■	■				
Verification of control measures													■	■	■				
Advisory function																			
Legal framework																			■
WSP establishment																			■
Lessons from training																			■
Lessons from outreach																			■

8. Indicative Budget

8.1. Budget needs

	Euro (0,743 based on the April rate 2010)	USD
<i>Preparatory phase</i>		
Establishment of the WSP team	1,486	\$2,000
Translation of the Water Safety Plan Manual into Georgian, printing and distribution.	1,486	\$2,000
Laboratory preparation incl. questionnaire and software development	2,972	\$4,000

<i>Field activities</i>		
Sanitary inspection in the Dusheti and Marneuli districts	11, 142	\$15,000
Training workshop for local authorities	3,715	\$5,000
Outreach programme for local population	3,715	\$5,000
<i>Advisory functions</i>		
One specialist advisory mission from Germany	3,715	\$5,000
Reporting and communication costs	3,715	\$5,000
Miscellaneous incl transport between Tbilisi and Dusheti / Marneuli	3,715	\$5,000

8.2. Budget resources

	Euro	USD
WHO Professional staff one month over one year period	7,430	\$10,000
WHO Administrative staff two weeks over one year period	2,972	\$4,000
WHO Communication and administrative costs	1,486	\$2,000

Contributions in kind from the Georgian Ministry of Health, Ministry of the Environment, local authorities.

9. Resources in Georgia

To be filled by Georgia

	Unit cost	time	total
Diver			
Field staff			
Lab staff			

Data management			
Supervision			

10. Risk for reaching project objectives

- Failure of the awareness raising efforts concerning the importance of environmental protection for improvement of environmental health among the Georgian population and staff.
- Lack of involvement of the local staff
- Lack of follow up
- Lack of scientific knowledge

11. Follow-up

The follow up of the implementation of the project will be based on the commitment of the Georgian Authorities and on the written document describing the workplan for 2011-2013¹⁶. This document contains a section dedicated to small-scale water supplies and sanitation¹⁷, focusing on four main activities: Development of policy and guidance documents – Improvement of evidence base on the current status of small scale water supplies – Water safety plans/Water and Sanitation Plans for schools – Facilitating, networking and sharing experience. It is expected that the draft work plan will be adopted by the Meeting of the Parties (Bucharest, November 2010)

12. Bibliography

¹ Small Scale System: according to the EU Drink Water Directive, Art.9 (7). <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31998L0083:EN:NOT>

² Data from the 2010 WHO UNICEF Joint Monitoring Programme, *Progress on sanitation and drinking water 2010 update*. www.wssinfo.org

³ WHO, *Protocol on Water and Health*, London, 1999. (Art 4 §2 (a)) “Adequate supplies of wholesome drinking water (...), shall include the **protection of water resources** which are used as sources of drinking water, treatment of water and the establishment, improvement and maintenance of collective systems.”

⁴ The National Centre for Disease Control and Public Health and The Georgian Environmental and Biological Monitoring Association (GEBMA).

⁵ Biennial Collaborative Agreement (BCA) between the Ministry of Labour, Health and Social Affairs of Georgia and the Regional Office for Europe of the World Health Organization: <http://www.euro.who.int/document/bca/geo0809.pdf>

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⁶ Data from the 2010 WHO UNICEF Joint Monitoring Programme, *Progress on sanitation and drinking water 2010 update*. www.wssinfo.org

⁷ Data from the 2010 WHO UNICEF Joint Monitoring Programme, *Progress on sanitation and drinking water 2010 update*, p.42. www.wssinfo.org

⁸ Report on the Workshop on Water Safety in Small Scale Water Supplies in the European Region (Bad Elster, Germany, 26 – 27 November 2008) available from URL: http://www.unece.org/env/water/meetings/wgwh/Secondmeeting_2009/ece_mp_wh_wg_1_2009_9.pdf

⁹ WECF: Woman in Europe for a Common Future. ELA: Empowerment & Local Action programme <http://www.wecf.eu/english/projects/ela/georgia.php>

¹⁰ WHO, *Guidelines on the setting of targets, evaluation of progress and reporting*, 2009, p.38-39

¹¹ Anon (2009) Water Safety Plan Manual Step-by-step risk management for drinking-water suppliers WHO Geneva IWA URL: http://www.who.int/water_sanitation_health/publication_9789241562638/en/

¹² Full text of the Protocol available at URL: <http://www.unece.org/env/documents/2000/wat/mp.wat.2000.1.e.pdf> , list of ratifying countries available at URL http://www.unece.org/env/water/status/lega_wh.htm

¹³ Report on the Workshop on Water Safety in Small Scale Water Supplies in the European Region (Bad Elster, Germany, 26 – 27 November 2008) available from URL: http://www.unece.org/env/water/meetings/wgwh/Secondmeeting_2009/ece_mp_wh_wg_1_2009_9.pdf

¹⁴ Dr Enzo Funari, Higher Institute for Public Health, Italy – article in preparation

¹⁵ WHO, *Guidelines on the setting of targets, evaluation of progress and reporting*, 2009

¹⁶ WHO/Euro, *Programme of work for 2011-2013*, 2010: to be adopted at the meeting of the Parties (Nov 2010).

¹⁷ WHO/Euro, *Programme of work for 2011-2013*, 2010, p.10