



WATER & RISK

Editorial

Dear colleagues,

The year 2010 has afforded a milestone for the global discourse on water, sanitation and health, which has, at least to my impression, not yet been adequately appreciated: By a vote of 122 in favour to none against, with 41 abstentions, the UN General Assembly adopted a resolution introduced by Bolivia calling States and international organisations to provide financial resources, build capacity and transfer technology, in scaling up efforts to provide safe, clean, accessible and affordable drinking water and sanitation for all. On July 28, the UN declared the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights! While representatives of some countries expressed reservations concerning the legal basis or suspected counterproductive interferences with the work going on in the Human Rights Council, others like Germany emphasised commonalities and invited delegations to support and participate actively in this "Geneva process". Referring to the UN resolution, Roger Aertgeerts, WHO European Centre for Environment and Health, highlighted the outstanding significance of the Protocol on Water and Health to the Water Convention being the single legally binding international instrument in this field, during the 2nd Meeting of the Parties in Bucharest in November of this year. The challenge is now to turn the right into reality.

Our current newsletter comprises reflections and case studies of Paul Osborn about the strategy of the 300in6 initiative, which aims at enhancing existing or new activities in the field of water, sanitation and health. Furthermore you will find an interesting field report about the implementation of a Water Safety Plan in a Romanian school provided by Margriet Samwel from the lead organisation of this initiative, Women in Europe for a Common Future. As usual, the newsletter is completed by short reports from conferences and meetings as well as notices about events taking place in the next year.

We thank our contributors and our readership for their interest, encourage you to contribute to one of the future issues of 'Water & Risk', and wish you untroubled and peaceful Christmas days as well as health and success in 2011!

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Safe water: is purity a paradox?

Introduction

Water is a paradox. It always flows to the lowest possible level, right? Except for pure water. That has not yet reached some four billion people on our planet, rendering our common future unhygienic, unhealthy and, like so much of the water, unsafe. In short, a massive risk exists. It is indeed time for a new paradigm.

Some statistics deaden the senses of the reader to their tragedy, but in the professions that care about the supply of good quality water, there are three statistics that never lose their power. Almost 4 billion people are waiting for secure, safe water. Some 884 million have no access at all and for another 3 billion, access to piped water comes with the safety risks caused by poor maintenance and contamination. In response, rapid progress is being made in the development of affordable, needs-oriented, decentralised, safe water delivery systems and household water treatment (HWT) options, including safe storage. With this inflow of new solutions, the challenge now for governments, the private sector and NGOs is to make them available on a colossal scale.

The flow of innovation has never been richer, or more affordable, with new products and services in terms of water disinfection, safe storage and – above all – filters. As a consequence, tens of millions of people each year are able to adopt safe water options at household level.

Quantity and quality – inseparable issues

Traditionally, government policies in developing countries have focused on the extension of centralised water networks to the excluded parts of the population. The results have often been disappointing: in rural areas many millions still lack a reliable source of water and rely on open ponds for their water use. Hampered by corruption and the lack of financial resources, infrastructure has not kept up with enormous population increases and the rural exodus towards cities. The key problem in the developing world is the poor quality of piped water. Water might be treated at source by operators, but it becomes contaminated during transport due to leaks in piping systems and frequent interruptions of service.





Figure 1: Women collecting water -- and many bacteria -- near Goma, DRC
Photo: 300in6

In recent years, as in the energy sector, private market players have come up with promising solutions such as filters, chlorine and water kiosks for low-income customers as a demand-driven alternative to rigid governmental approaches. These bottom-up business models do not replace the need to extend water networks, but to be realistic, that will remain a long-term dream beyond the horizon for several decades to come for millions in rural and poor urban communities.

What these initiatives all symbolize is revolutionary – and thus potentially liberating – for much of the conventional water community, whose mindset is bound by the grid structure of centralised water distribution and the, for many, elusive rollout of safe pipelines. They shift the focus from the issue of quantity, which dominates the noble but illusory hope of pipeline rollouts, to the issue of quality of water for the four billion low-income consumers living at the ‘Base of the Pyramid’ (BoP).



Figure 2: Transporting drinking water from a community-run water kiosk in rural India
Photo: 300in6

In this thrust of promising safe water solutions, and the accompanying changes in philosophy and practice, the 300in6 initiative works to enhance focused alliances of like-minded partners. Born from the powerful wish to achieve a more massive scaling-up of access to quality water within - and where necessary, beyond - the existing Millennium Development Goals of 2015, the vision leaves aside the classical ‘giving-away’ approach and instead implements a more effective, efficient delivery system involving private initiatives.

Our clusters of cooperating agencies extend far beyond conventional boundaries, and herein lies the challenge of ensuring that we remain significant partners for our ‘traditional’ constituencies as well as appealing to the relatively new and novel partners in other fields. At the end of the day, it is the shared vision of scaling-up, of focused action and achievement within the frameworks of our guiding and marketing principles, which will define who takes up common causes with 300in6.

At the outset, our non-exclusive typology of partners and audiences includes policy makers; funding agencies and philanthropists; researchers, funders and sector implementation agencies in HWTS and decentralised safe water delivery systems; the corporate sector; communication and marketing specialists; local development initiatives; and entrepreneurs, principally in small and medium-scale enterprises (SMEs). This latter group of enterprises includes producers, suppliers, distributors, business support services, finance and technology providers and embraces amongst others, the microfinancial service sector.

It is this rich combination of types of institutions and enterprises which brings a new energy force to the issue of access to safe quality water and also marks our unique nature.

Building bridges for better business models

We wish to build upon the solid base of important scientific work and shared experiences undertaken on innovative technologies by professional agencies within the International Network for the Promotion of Household Water Treatment and Safe Storage (HWTS), founded at the WHO and now co-managed by the WHO and UNICEF. We are embedded inside this well-focused community of several hundred professional water research and implementation agencies and our wish to enable them in the process of upscaling their work, is part of our fundamental strategy. Similarly, we occupy strategic positions in the communities of professionals involved in other forms of decentralised safe water delivery systems and in the parallel worlds of business development and enterprise modelling, in BoP approaches and in social marketing. This bridging – or ‘connector-vector’ – position is typical of how we seek to encourage synergies through the leverage of connections.

One example of our role towards our peers and colleagues in this rich configuration of networks is to enable them all to adopt similar, or complementary, styles of work, including targets, together with the exchange of information and experience. Of course, this involves talking the same language and having access to comparable datasets. Therefore, we have started work on the ‘2012 Safe Water Yearbook’, the working title for the first edition of an annual state-of-the-art review on the adoption of HWTS and decentralised safe water delivery systems. It is set for publication in March 2012 and will contain data on the progress made in 2011 and previous years, together with a series of practitioner and observer articles on the key issues for years ahead.



Case studies

Case study 1: Pureit: The Unilever Pureit filter, targeting India's urban BoP

In 2005, Unilever Hindustan launched a sophisticated-looking water purifier for the aspiring, upper segments of India's BoP. The Pureit device consists of four parts: a microfibre mesh (to filter dirt), a carbon trap (to remove parasites), a chlorine tablet (to kill viruses and bacteria) and a polisher (to improve taste). It can be purchased in 14,500 retail outlets or from one of many door-to-door retailers. Thus far, it has already attracted three million households, mainly in India's large or middle-sized cities. The relatively high US\$ 35 cost, however, makes the filter unattainable for the millions of Indians who live on less than a dollar per day. All the same, in the future the company may move its attentions downwards socially as markets at the upper levels of the BoP become saturated.



Figure 3: Demonstration of the Pureit filter, a product for the urban middle-class market
Photo: 300in6

Key advantages

- Attractive, prestigious design and superior technology: "as safe as boiling"
- Access to an existing Unilever distribution network
- Over the past decade, Unilever has shown strong interest in low-spending customers. Some 10 years ago, it established the 'Shakti' (empowerment) programme, training women in rural India to become retailers of Unilever products. By 2006, Unilever had trained 30,000 women. The Shakti women could be a point of entry for the promotion of the Pureit filter among rural customers.

Problems

- Only urban, more affluent segments within the BoP can afford US\$ 35 for the filter device and the additional US\$ 8 four times per year for the replacement kit.

Potential

At present, Pureit filters are a good option for India's urban lower middle class, the upper sector of the BoP. Unilever has started marketing to this segment, to first harvest the low-hanging fruit. Recently, around the time of the launch of the Swach filter by competitor Tata for only Rs.499-749 (US\$ 11-16), Unilever also introduced a 'light' version (lower capacity) of its Pureit filter for only Rs.1,000 (US\$ 20). Furthermore, some initial steps have been taken by NGOs such as PATH to allow for more flexible payment options through credit. However, in regions where credit markets do not work, such as in many regions of sub-Saharan Africa, it may be difficult to profitably distribute the filters.

Future steps

- Trickle down to the 'real' BoP. This could for example include the development of different types of filters, considering the difference in both buying power and preferences among rural and urban customers.
- Find more flexible financing schemes in cooperation with partners from the credit sector in order to extend the customer base towards the bottom.
- Involve existing structures, such as the Shakti network in cooperation with micro-finance initiatives, for delivery of the filter to rural areas.

Progress

CONSUMER ACCEPTANCE: Excellent
AFFORDABILITY: Not yet achieved
VIABILITY: Excellent
SCALABILITY: Reasonable

Case study 2: Siphon filters: The Tulip Siphon Filter – introducing technological innovation

In 2002, the Dutch businessman Klaas van der Ven started to experiment in India with traditional sand and ceramic filters. The products he encountered were usually very heavy, slow and not at all user-friendly. One day in a remote village he found community members using a siphon to pump water. This is where the idea grew to develop a convenient and fast-working siphon ceramic filter. Under the aegis of his company Basic Water Needs, van der Ven established a production facility in India and started selling the filters in 2007. To develop the filter further, Basic Water Needs has decided to stay low-profile for the time being. However, it already expects to break even in 2010, with current sales of 240,000 Tulip filters to NGOs annually,

Key advantages

- High flow rate due to siphon technology
- Light design and low price (factory price approx. US\$ 5; retail price approx. US\$ 10) because, unlike other devices, the Tulip filter does not have a reservoir for water storage.
- Easy to maintain thanks to pre-filtration and back-washing technology



Problems

- Bureaucratic hurdles: van der Ven, the founder of Tulip filters, claims to spend most of his time in obtaining government permits for the production and distribution process. The filters are produced in India and usually face high duties when imported by other developing countries.
- The Tulip filter has been warmly welcomed by experts in the field. However, most projects to resell the filters to the end-consumer are just starting. The commercial success of the product has still to be proved.
- A survey on consumer acceptance in Mozambique showed that users are generally satisfied with the quality and the performance of the device. However, when asked if the household would invest money in a new ceramic filter element for €2 each time the old element had to be replaced, two-thirds of the households answered they would probably not.
- Has not yet removed any viruses.



Figure 6 : Woman monitoring the thickness of the filter element of a Tulip Siphon filter
Photo: 300in6

Potential

Basic Water Needs currently sells about 20,000 units to NGOs every month, without having actively promoted the filter so far. Its high potential lies in its innovative technology. The filter is faster, more convenient and cheaper than competitive filters on the market.

Future steps

- Identify the most promising, commercial end-user distribution model among NGO customers.
- Find answers to explain the gap between high customer acceptance and a low willingness-to-pay in Mozambique.
- Start marketing activities to become high-profile before competitors copy the technological features of the Tulip filter.
- Cooperate with micro-finance partners to stimulate sales among the bottom BoP.

Progress

CONSUMER ACCEPTANCE: Already reasonable
 AFFORDABILITY: Good progress, more needed
 VIABILITY: On target, but more work required
 SCALABILITY: Yes, but adjustments needed

Case study 3: Watasol: Local chlorine production and sales

The Watasol method of the Geneva-based NGO Antenna Technologies – the name applies both to the overall method and to the disinfectant solution – is to build up the ‘local’ aspects. It provides local enterprises with electro-chlorinators for the local production of chlorine.

Its commercial aspects stand out because of its cost-efficiency. An Antenna electro-chlorinator, serving the needs of 2,400 people, costs only €200. In the Dabola prefecture in the Faranah region of Guinea, the NGO Tinkisso acts as a local producer and sells one litre of chlorine – enough to meet the annual needs for safe water of a household – for just US\$ 1. The product has been accepted by local people and proven to be operationally viable. However, in the complex and challenging environs of Dabola, Tinkisso has reported difficulties in maintaining regular supplies to its network of 16 water kiosks and 16 community workers. Poor infrastructure and limited transport hinder the distribution process. A new strategy is being tested in four other prefectures in Faranah in cooperation with the local health authority, using the existing channels of health centres to provide chlorine and awareness-building. In addition, chlorine is also sold door-to-door by health education agents.

Key advantages

- Low-cost solution
- Independent, local production
- Refill system
- Chlorine can be used as a disinfectant contributes to hygiene promotion

Problems

- Chlorine taste
- Delivery to dispersed areas with water kiosks has proven to be too costly and complex
- Quality assurance – monitoring is costly
- Source of electricity (generator and high cost of fuel)
- Finding the right application

Potential

Watasol is a very cost-efficient way to produce chlorine on site in a decentralised manner. A big advantage of local chlorine production is that plastic flasks can easily be re-filled. In order to protect the Watasol brand, Antenna must find a reliable system of quality control. The distribution of the chlorine through 16 water kiosks has proven to be too costly and complicated without adequate vehicles for distribution. New forms of distribution are being tested by Antenna Technologies in South Asia and Africa.

Future steps

- Use existing communication and delivery channels to isolated areas, or bundle the bottled chlorine with other ‘hot’ products such as cell-phone cards or food, to raise revenues per delivery.
- Price differentiation ie. higher prices in isolated areas



- Using relatively cheap technologies such as bicycles to cover distances
- Improve the taste and design of the product

Progress

CONSUMER ACCEPTANCE: Already acceptable, but simplification required
 AFFORDABILITY: Excellent
 VIABILITY: Reasonable, and excellent as a business model
 SCALABILITY: Very good

Goal is to double the rate of scaling-up

In 2009, when the 300in6 initiative started, an estimated 40 million people in the MDG 7 target group were using new HWT options such as chlorine, SODIS (Solar Disinfection) or filters. In business-as-usual scenarios, this number is likely to reach some 150 million by 2015. The aim of the 300in6 initiative is to double the present speed of dissemination, to 300 million. The parameters of this virtuous circle are thus:

- Making affordable water delivery systems and HWT products widely available.
- Reaching the BoP effectively with large-scale social marketing campaigns and awareness-building about the social and economic benefits of safe water and hygiene. Social marketing is the task of governments, multilateral organisations and NGOs.
- Creating new business opportunities for both industrial and financial sectors involving international large-scale industries and local medium and micro-scale entrepreneurs.
- Deepening the impact of safe water solutions with substantial health improvements, increased school attendance, reduction of sick days and the empowerment of women.
- Contributing to the fulfilment of Millennium Development Goals with a focus on MDG 7 and MDG 4 on reducing child mortality.

Our guiding principles mean business

The imperative of safe water for all requires an emerging, vibrant new focus. 300in6 proposes the following guiding principles:

- **Consumer Orientation:** To consider people as consumers, not as mere beneficiaries or recipients, and to give them the freedom to choose among different safe water solutions in a multi-product or multi-service approach.
- **Scalability:** To focus on products that have the potential to be scaled-up radically.
- **Treatment at point-of-use:** To concentrate on treatment at the point-of-use and in proximity with sites in such institutions as clinics and schools and at decentralised distribution points such as water kiosks. This addresses an issue which was not included in MDG 7, which refers only to safe water at the source, and not at the point-of-use. Water can become contaminated in transport between the source and the point-of-use, or in storage in the home.
- **No Gifts:** To stress that safe water solutions should not be given away, except as a temporary solution in emergency situations. Whilst safe water is now a human right, it should not necessarily be free-of-charge. Smart subsidies may be granted, but only if they stimulate markets and do not distort them.
- **Affordability:** To encourage the private sector to deliver high-quality products and services, including options that are affordable to consumers at the BoP.
- **Regulation to enable uptake:** To urge governments and NGOs to shift their role from direct delivery to market creation, through such instruments as procurement and associated labelling and standards. Emphasis is needed on regulation, social marketing and preventing any distortions by private initiatives.

Our marketing principles

There is little new in our marketing principles, except that we wish to enable previously isolated commu-



Figure 4/5 : The pot-style ceramic, 'Rabbit' filter, developed by Potters for Peace, has much success in the Base of the Pyramid in Cambodia and helped to 'socialise' the technology as a 'must-have'. Then it became synonymous with poverty, and now a 'luxury' version with less stigma and more prestige is being developed for the high-end of the BoP.

Photo: 300in6



nities to take their own decisions and to make their own choices in their access to and adoption of safe water options. Thus we apply the following four guidelines:

- **Product:** Products and services should be appropriate, affordable and desirable ("must haves") in terms of consumer preferences at the BoP.
- **Place:** Products, spare parts and services should be regularly available and close to the customer, even in the remotest village.
- **Promotion:** We envisage massive up-scaling. This requires innovative commercial and social marketing. The social thrust is a public task, to create awareness of safe water and provide hygiene education, whilst the private sector will stimulate sales of particular products and services.
- **Pricing:** The range of available products must include affordable options for low-income customers, including the use of flexible payment and financing schemes.



Figure 6: Filter for household water treatment on its way home
Photo: 300in6

Our starting strategy = benefits to all stakeholders

The 300in6 initiative does not implement projects itself, but enhances existing or new activities by its members. Nor is it a membership organisation in the classical sense. Instead, having been initiated by a small core group in 2009, we work with our supporters and partners – namely all those who share, support and/or implement our guiding and marketing principles.

It is these supporters and partners who define the priorities of 300in6, within the framework of our guiding and marketing principles and our overall mission.

Already, the benefits of being associated with 300in6 are evident to a growing number of organisations. They include access to the experiences and aspirations of like-minded bodies; the ability to publicise and garner comment on achievements; the creation and dissemination

of standard tools and procedures for monitoring and reviewing progress, as well as opportunities for publishing and networking.

As we are joined by a constant flow of supporters and partners, our initial operations will focus primarily on these points, mainly as a communication and connector platform:

- **Advocacy:** 300in6 will make presentations at events such as the World Water Week in Stockholm, the Rural Water Supply Network Forum 2011 in Uganda and the World Water Forum 2012. Information on (new) products and lessons learnt can raise awareness and support for the initiative.
- **Market research:** A study on safe water as a business is in preparation, in cooperation with leading institutions from both the private and the public sectors. Based on field visits, the publication will present and assess the latest business options, market barriers, and recommendations to overcome current obstacles. The publication will stimulate private initiatives in the water sector and will be launched early in 2011. The preliminary report entitled 'Safe Water at the Base of the Pyramid – how to involve private sector initiatives in safe water solutions' was presented at the Stockholm Water Week in 2010.
- **Business fairs, linking suppliers, financial institutions and demand:** As with the 'Lighting Africa' initiative in the energy sector, business fairs will be co-organised. They will bring together the most promising and innovative suppliers with interested partners from the financial sector and possible clients such as NGOs and informal sector groups. Grants could be awarded to the winners of business competitions.
- **Boosting demand through large-scale, social marketing campaigns:** One of the most challenging tasks is to reach people who are unaware of the importance of safe water and hygiene. This requires social marketing approaches to change the behaviour of large numbers of the poor. Strategically, this recognises the crucial role of communication, instead of treating it as an administrative add-on. 300in6 can explore how to facilitate social marketing campaigns at the national level that quickly create a critical mass in the market.

Social marketing to us is not, however, the conventional "it's good for you!" approach. Instead, we wish to align ourselves with the emerging New Generation Social Marketing, sometimes known as Social Marketing 2.0. In the case of safe water, we wish to emphasise that the adoption of safe water options by a household is its own investment in, amongst other things, its own physical and financial well-being. Less sickness means a better quality life, more productivity, more ability to learn, more availability for employment.

- **Stimulating the knowledge exchange and match-making:**

The 300in6 members will collect more experiences and data, the dissemination of which can be facilitated through the website and other media. 300in6 can become an information source for good practice. Interactions between members will encourage the development of new partnerships and projects.



The activities of 300in6 are supported by a compact secretariat currently located in the Netherlands, under the management auspices of Aqua for All and with additional support from such sources as the Swiss Agency for Development and Cooperation. Its tasks include:

- Matchmaking, fundraising and financial engineering. This can include funding acquisition, building financial partnerships for co-financing and full financial management and monitoring (based on 'no cure, no pay', or pre-determined success fees).
- Support services such as organising events, representation in studies and programmes, and their monitoring and evaluation.
- Participation in the 'Access to Safe Water at the Base of the Pyramid' study.
- The preparation of a series of sector-strategic publications including the Safe Water Yearbook,
- Consideration of a video series on safe water solutions, and replicable business models
- Preparation of other publications such as 'Smart Social Marketing for Safe Water', which will include a state-of-the-art review of New Generation Social Marketing 2.0
- Advocacy for suitable technical solutions and good business models of safe water solutions at meetings and conferences
- Mastering a website, sharing information on new developments by means of a newsletter and press releases in addition to feeding such newsletters and peer publications as the WHO-HWTS Network bulletin, IRC Source and other (multi-)media outlets. It will describe the location and scope of the work of institutional

members.

- Communication support to the public relations activities of members and partners
- Monitoring and reporting progress in reaching the scaling-up goals

We invite your suggestions and requests for action and look forward to working with you.

For more information:

Safe Water at the Base of the Pyramid – how to involve private sector initiatives in safe water solutions, 300in6, The Hague, 20 p, 2010, available for download at www.300in6.org

Smart Disinfection Solutions - Examples of small-scale disinfection products for safe drinking water, Netherlands Water Partnership/ KIT, Amsterdam, 72 p, 2010. Available for download at http://www.kitpublishers.nl/net/KIT_Publicaties_output/ShowFile2.aspx?e=1678



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Case study of the application of Water Safety Plans in a school in Romania

Introduction

The Water Safety Plan (WSP) is a concept for developing a process-orientated observation of the water supply. Risks that could affect water safety and human health need to be identified at every stage of the water supply: from the potential risks of water pollution in the catchment area all the way along the line to the consumers. Once the risk is known, measures to minimise and manage the risks need to be determined. The final products – maps, posters, reports, a safe water strategy - give the local community information on how to avoid the risks of pollution.

The focus of WECF activities on developing WSP for small-scale water supply systems involving schools was to build local capacity and strengthen and mobilize the community to improve access to safe drinking water. For educational purposes, a WSP toolbox provides a WSP manual with background information about the aims of the WSP, about the properties of drinking water

to individual wells, three villages including Tiganesti use public taps. The water used is groundwater from the first aquifer, at a depth of 3-50 m. Most of the villagers in Tiganesti have a well in their yard. In addition, a spring exists on the outskirts of the village, which is captured and the water is accessible for public use.

Preparatory works by the school

In Tiganesti, 11-15 year old pupils from 8 classes and four of their teachers were involved in the WSP activities. Two hours per week were spent on developing a WSP for their community. The five longitudinally monitored water sources were marked on a map of the village (Figure 1).

Source 1: Drilled individual well served with water from 4.5 m depth

Sources 2, 3 and 5: Individual wells served with water from 3-5 m depth

Source 4: Captured spring fed with groundwater from 20-30 m depth

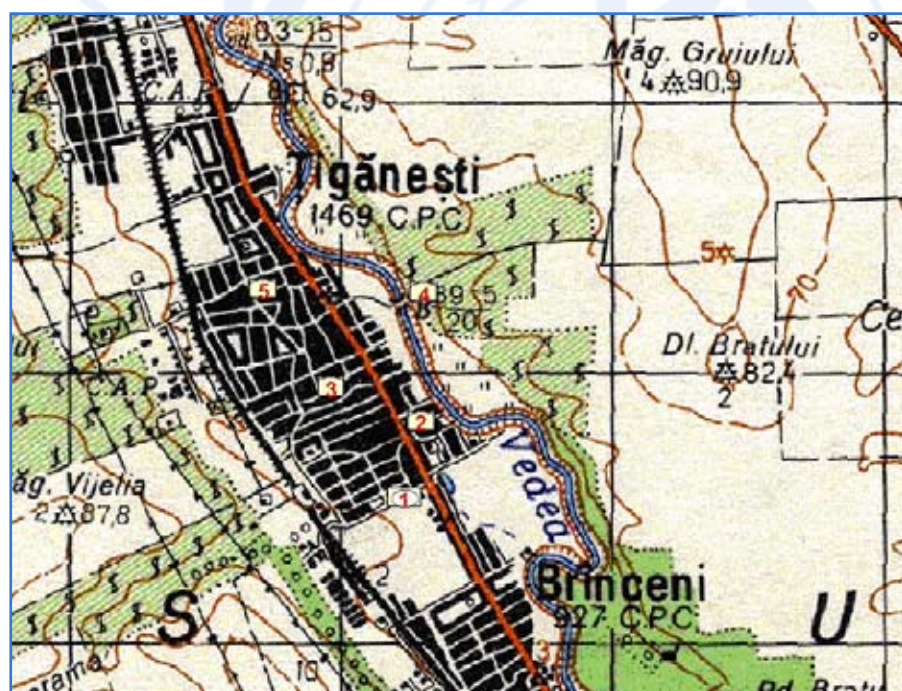


Figure 1. Map of the village Tiganesti indicating the location of the nitrate-monitored wells

and sources of pollution and related health risks¹. After training teachers, the schools carried out the WSP activities from November up to the end of the school year, in May or June 2009.

WSP activities at the Tiganesti School, Teleorman County

The target area was chosen from the ongoing WECF project 'Safe Water, Sanitation, Health and Dignity'². None of the ten selected villages are served by a central water supply network or sewerage system. In addition

of 50 mg/l (Figure 4). A relationship between precipitation events, the seasons and the fluctuations observed in the nitrate concentrations was identified by the school research. The very high nitrate levels of 150, 200 and 250 mg/l found in December decreased dramatically during January and February and even dropped to the maximum allowed nitrate concentration of 50 mg/l or less. However, in March and April nitrate levels again increased beyond the nitrate limit of the EU Water Directive. Neither particles, nor abnormal colour or pH values were observed.

Monitoring results

The pupils of the school tested the 5 selected wells every 2 weeks for nitrates, pH and turbidity. In addition, precipitation events and the air temperature were noted. The pupils recorded that in particular the nitrate concentrations in the shallow wells (Nos. 2, 3 & 5) in the middle of the village fluctuate tremendously and exceed the EU nitrate limit. The two water sources on the border and outskirts of the village (Nos. 1 and 4) did not always exceed the EU nitrate limit





Figure 2: Teaching aspects of water quality
Photo: EuroTeleorman



Figure 3: Pupils carrying out nitrate quick tests
Photo: EuroTeleorman

The WSP team at the schools suggested that the drop in the nitrate concentrations after December was a result of the fact that at Christmas many pigs are slaughtered and therefore the number of pigs and amount of manure in the village decreases. In addition, the leftover fertilizer is washed out during November – December

and therefore barely contributes to water pollution in January and February.

Unfortunately, the water pollution increased again with the fertilisation of the fields in springtime.

The team observed that household water sources (Nos. 2, 3 and 5) are often located near to animal shelters as due to the limited space available to most households there is no possible alternative.

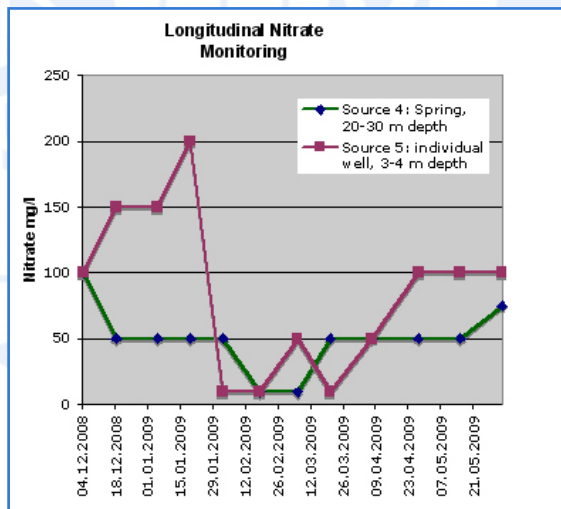
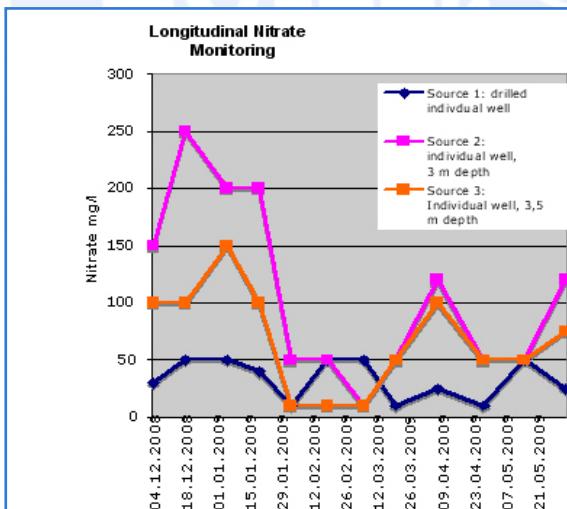


Figure 4: Results of longitudinal nitrate monitoring of 5 drinking water sources in Tiganesti, Teleorman

Risk assessment of the monitored water sources

In addition to the longitudinal nitrate monitoring of water sources, pupils carried out a sanitary inspection of wells using the WSP manual checklist. In the checklist, risk is ranked in four groups according to the score that was reached during the inspection: low risk (<2 points), medium risk (3-5 points), high risk (6-8 points) and very high risk (9-10 points).

The sources of pollution, such as the location of the manure heap or pit latrine or the current status of the well, were identified by the pupils during field visits. One of the five inspected water sources (No. 4, the spring; nitrate concentration: max 50mg/l) scored two points, which indicated a low risk of pollution. The other four sources scored medium to high risks, a score of 8 points meaning a high risk was identified for the well with the highest nitrate value of 250mg/l (fig 5).



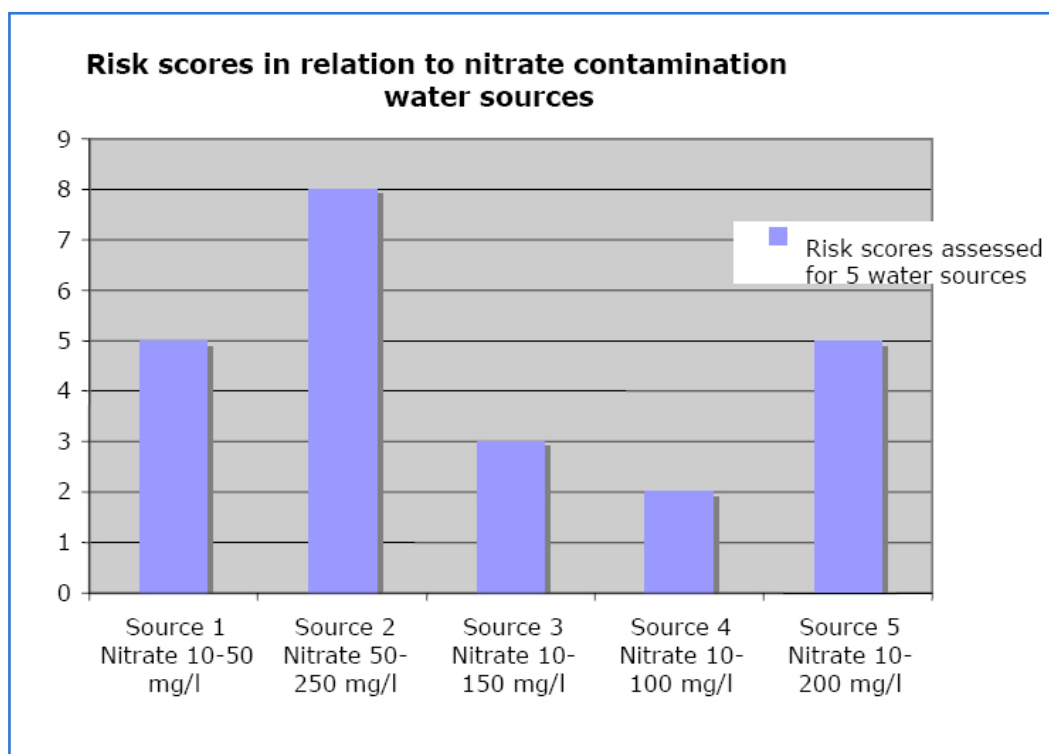


Figure 5: Results of the sanitary inspection of the 5 nitrate-monitored water sources in Tiganesti

Experiences and recommendations of the Tiganesti WSP team

The WSP team identified the following sources of pollution at a local level:

- Latrines without septic tanks
- Animals raised within households
- Chemical substances (in particular nitrogen)
- Discharges of detergents into yards
- Cosmetic products
- Improper storage conditions for fuels
- Random disposal of solid waste
- Flooding and overflows affecting groundwater
- Dust accumulating when wells are not covered

To improve water quality and reduce health risks at the household level the WSP team suggested the following measures:

- Construction of a safe sanitation system as soon as possible
- The raising of livestock should be undertaken outside the village
- Using ecological landfill
- Adequate coverage of the wells
- Collaboration of the citizens with the local authorities
- Construction of a central drinking water supply as soon as possible
- Training citizens in proper hygiene
- To improve water quality and reduce health risks at the community level the WSP team suggested the following measures:

- Storing water in covered containers
- Periodic formalized analysis of the water
- Establishing ecological landfill
- The development of Local Council decisions to impose

- compliance rules for the use of drinking water
- Establishment of a local NGO to improve cooperation between local authorities and citizens
- Development of projects to attract European funding to help with the improvement of the WSP
- Public participation in future projects
- Conducting voluntary activities to improve environmental quality and drinking water: e.g. waste collection, cleaning wells and channels.
- Implementation of environmental education and enactment of existing legislation.
- Continuing to pursue projects such as WSP at the school and community level.
- Stabilisation of the potential reserves of underground water by hydro-geological mapping.



Figure 6: The schools identified the randomly throwing out of solid waste as one of the water polluters Photo: Margriet Samwel, WECF





Figure 7: Pupils attending an event on water management in the Town hall of Turnu Magurele
Photo: Margriet Samwel, WECF

Remarks about the results of the WSP in Tiganesti

The results of the water tests and the risk assessment were presented to the community and served as a basis for further discussion and action. Collaboration with the local administration and environmental institutions was initiated.

The wells in the village are already affected by severe water pollution. Even the water from the spring from a 20-30 meter deep source reached the maximal nitrate value of 50 mg/l set by the EU. More investiga-

tion would be needed to clarify the extreme fluctuations of the nitrate values in the wells. For example, ammonia analysis could indicate if indeed less animal and human excreta entered the groundwater or if when the soil is water-saturated due to heavy rainfall the oxidising rate of ammonia into nitrates is decreased³. A decrease of the nitrate concentration in wells during the winter was observed in nitrate-polluted wells in other Romanian locations⁴.

References

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PhD Student Workshop, Cannes Water Symposium June 29th- July 1st 2010

The 2nd Workshop of European Water and Health PhD Students, was sponsored by Suez-Environment, and took place in the Hotel ADOSOM Windsor in Cannes. 20 young scientists and 8 senior researchers from 6 different countries met to present and discuss the fields they are currently working in and their research topics. This year the themes focused on epidemiology, microbiology, toxicology, analytical chemistry, engineering, risk regulation, the science of water hygiene and public health. The broad range of themes was discussed thoroughly by all participants. Four of the presentations were chosen to be presented at the Cannes Water Symposium to illustrate the most important aspects of the workshop to an international audience.

The German PhD students came from the 3 different universities. Their presentations dealt with topics concerning water problems from diverse perspectives. The Institute for Hygiene and Public Health was represented by 3 members. They talked about the problems of drink-

ing water biofilms and their relevance for hygiene; how to deal with pathogenic contamination of water and how water actually affects human well-being in cities.

The first presentation focused on the efficacy of chemical disinfectants against drinking water biofilms. Due to the current lack of guideline regulations a new three phase testing procedure for the efficiency of disinfectants was presented:

1. Testing disinfectants in an in vitro test (Quantitative Suspension Assay)
2. Testing in a quantitative carrier assay (Silicone Tube Model)
3. Testing in a field assay (Hygiene Monitor)

This lecture was chosen by the international scientific steering committee for the Cannes Water Symposium session.

The second presentation dealt with similarities between two incidents of E. coli. contamination of drinking water. One was an example of good incident manage-



ment and a positive outcome, while the other was the exact opposite. A closer look at the timeline of both incidents revealed, however, that despite good management, the outcome of both incidents could have been negative if the bacterial strains had been equally virulent. These findings demonstrate the necessity for more effective controls and fast detection methods to make quick and appropriate incident management possible.

The third presentation identified surface water in cities ("urban blue space") as healthy in various ways using the multi-dimensional concept of therapeutic landscapes as a description of the salutogenic health processes in places. "Urban blue space" can affect human well-being as an attractive, aesthetic element of urban landscape, as a social contact space or as a construct loaded with personal or societal symbolic beliefs. "Urban blue" was interpreted, along with urban green space, as a possibility for recreation and therefore preventive health protection for people in urban contexts.

It was very interesting to consider the different ways water-associated problems are handled in each country in Europe. A future target is to increase international projects and co-operation.

The atmosphere between the different generations of scientists during the workshop was very easy and friendly. In addition to the workshops, there were many possibilities to network with other young scientists. And of course, there are few cities as relaxing and beautiful as Cannes.

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IWA World Water Congress and Exhibition 2010 in Montréal

This year the IWA World Water conference took place from 19th-24th September in Montréal (Canada). Up to 18 parallel sessions provided a broad spectrum of water-related topics, including (waste)water treatment, water resources, river basin management, management of water services, energy and resource management, the impact of climate change and many more.

Under the heading "Water and Health" several aspects of water ecology, microbiology and chemistry were presented during the week. As a warm-up on Sunday, lively discussions took place during two workshops dealing with quantitative microbial risk assessment (QMRA) and the question 'How dead are 'dead' microbes in view of VBNC states of bacteria?'

Keynote plenary sessions each morning with speakers from all over the world, several industry forums and a large exhibition completed the conference schedule. At the IWA exhibition stand, the new WaterWiki website (www.iwawaterwiki.org) was demonstrated.

In addition to the conference programme, special activities for Young Water Professionals (YWP) were organized to help them to link up with potential mentors from the current generation of water leaders. These included a one-day workshop on Sunday, a YWP breakfast and a YWP reception, as well as a YWP corner in the exhibition hall and a meeting for the mentoring programme.

The Institute of Hygiene and Public Health was represented by a poster about "Source-oriented quantification of microbial contamination to support adapted surface water catchment management" by Christiane Schreiber.

Last but not least, mention should be made that the IWA Global Water Award for lifetime achievement went to Professor David Jenkins (USA) and Professor Blanca Jiménez Cisneros (Mexico); the IWA Women in Water Hei-jin Woo Award was awarded to Cassilda Teixeira de Cavalho (Brazil) and Rita Henderson won the IWA Young Water Professionals Award.

A list of lectures and posters can still be downloaded from the conference website. Visit:

<http://www.iwa2010montreal.org>

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Events on Water, Health and Risk Communication:

January 2011

Sustainable Water Resource Management and Treatment Technologies
19-22 January
Nagpur, India
http://www.neeri.res.in/water11_neeri/index.html

6th IWA Workshop in Japan
20-21 January
Yokohama, Japan
Email:jnc@jwwa.or.jp

February 2011

Wastewater Engineering
14-18 February
Newcastle upon Tyne, UK

March 2011

6th IWA Specialist Conference on Efficient Use and Management of Water
29 March - 2 April 2011
Dead Sea, Jordan
<http://www.efficient2011.com/>

April 2010

Environmental Forum SAVE the Planet - Waste & Water Management, Recycling
13-15 April
Sofia, Bulgaria

10th Specialized Conference on Small Water and Wastewater Systems & 4th Conference on Decentralized Water and Wastewater International Network & 3th Specialized Conference on Resources Oriented Sanitation (EcoSan)
18- 22 April 2011
Venice, Italy
<http://www.wastewater-venice-2011.com/>

III International Congress Smallwat. Wastewater in Small Communities.
25-28 April
Seville, Spain

May 2011

4th Canadian Wastewater Management Conference
17-19, May
Toronto, Canada

International Water Week

29.10- 4.11 2011
Amsterdam, Netherlands

Meetings under the Convention on the Protection and Use of Transboundary Watercourses and International Lakes

<http://www.unece.org/env/water/calendar.htm>
Geneva, Switzerland

Core Group of pilot projects on adaptation to climate change in transboundary basins
15-16 February
Compliance Committee of the Protocol on Water and Health
1-2 March
Bureau of the Protocol on Water and Health
7-8 March
Workshop and Task Force on Water and Climate
12-14 April
Working Group on Integrated Water Resources Management
2-3 May
Working Group on Monitoring and Assessment
4-6 May
Task Force on Target Setting and Reporting under the Protocol on Water and Health
31 May - 1 June

**The WHO CC Bonn thanks all readers and contributors
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and sends Season's Greetings and best wishes for 2011!**

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