

2001 Stockholm Water Symposium: Bridge Building Through Dialogue



Former Stockholm Water Prize Laureates discussed water issues with their younger counterparts during the 2000 Stockholm Water Symposium. Such dialogue-building between a variety of water actors will be the key focus at the 2001 Symposium.

Dialogue and compromise building between different interest groups were key themes during the 2000 Stockholm Water Symposium's workshops, which are summarized in this Stockholm Water Front beginning on page 2. As components to building water security in the new millennium, the two themes will be an integral part of the 2001 Stockholm Water Symposium, "Water Security for the 21st Century – Building Bridges Through Dialogue," which takes place August 13-16, 2001, during the World Water Week in Stockholm.

The overarching goal in 2001 will be to facilitate sustainable development by lin-

king water visions to economic, political and ecological visions. Influencing globalization and other remote driving forces will also be discussed. In general, the Symposium will contribute actively in bridge building within and between different groups involved in societal planning, economic decision making, water resources development and management, food production, and protection of ecological services.

For more information on the 2001 Symposium, including abstract submittal details, visit www.siwi.org to order, read, or download the entire First Announcement/Call for Papers. ■

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STOCKHOLM WATER FRONT

FORUM FOR GLOBAL
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SIWI Presents Water and Development Study to European Parliament

In November in Brussels, Belgium, SIWI formally presented its European Parliament-commissioned study on "Water and Development in Developing Countries."

The purpose of the study is to assist the Parliament as it formulates proposals for long-term strategies and short-term policies aimed at aiding developing countries to prepare and implement policies leading to efficient, equitable and ecological sound water resources management.

Meeting before the Parliament's Committee on Development and Cooperation, three members of the SIWI study team – Mr. Ulf Ehlin, Prof. Jan Lundqvist, and Dr. Gunilla Björklund – highlighted the study's key proposals. The SIWI team described how European Union programs could help achieve water sustainability in developing countries by supporting awareness building, information sharing, capacity development and education; development of management strategies, and co-operative arrangements and conflict prevention.

The audience included parliamentarians and staff people from the European Commission and other international organizations. They were interested in many of the "linkage" issues related to sustainable development – between, for example, "conflict" and "cooperation," and between "water" and "economy." Specific questions were also asked about the study's regional overviews, such as the Mekong River Basin, West/Central Africa and the Aral Sea.

Executive summaries of the report in English, German, Spanish, Italian and French are available on the SIWI home page, www.siwi.org. ■



Season's Greetings



from the Stockholm International Water Institute

2000 Stockholm Water Symposium Workshop Conclusions



Institutional arrangements and technological improvements are necessary to reduce resource demand and water wasting among sectors and users, including agriculture and industry.

WORKSHOP 1

Steps Towards Increased Effectiveness in Water Use – Possibilities and Replicability

Chair: Mr. Vincent Bath, South Africa, Rapporteur: Prof. Jan Lundqvist, Sweden

Development with less water and with less environmental impact

Underlying the presentations and discussion in Workshop 1 was a recognition of the necessity to improve water use in terms of increasing output of food/biomass, industrial goods, etc., with comparatively less water input. Both in terms of quantity and quality parameters, the stress on water is high and trends show that it is mounting, although the trend looks significantly different in different parts of the world. It was shown that intensified land use, which increases the rate of water abstractions and degradation of quality (thus reducing the use options), is already resulting in huge deficits of usable freshwater. Examples from various parts of the world show that some rivers are seasonally depleted in parts of their basins, and other cases show a lowering of the groundwater table and streams that are turned into sewers. Such examples foretell about serious obstacles for environmental sustainability and human welfare.

Given the urgent need to reduce poverty and the urge for “development” – both of which presume that the amount of goods and services produced in society must be increased and thus that the pressure on water tends

to increase further – it is fundamental that permissive use of water and the associated pollution load is curbed, wherever they occur.

Institutional arrangements and technical improvements are complementary

A combination of institutional arrangements and technological improvements were seen as the solution to this challenge. It is necessary to reduce resource demand among water-wasting sectors and users. If some water can be saved without corresponding losses in production or welfare, several advantages will occur. Some of the saved water can be supplied to groups who are currently deprived of water or it can be used to expand production. It also reduces the pressure on water systems, since it will delay the need to build additional structures. An additional advantage is that such postponement will save scarce financial resources. Social and economic benefits could thus be achieved alongside with increased eco-efficiency. The concepts of “factor 10” and “factor 4” refer to the need to reduce overall pressure on natural resources but also to increase the resource use efficiency and to meet the needs of the poor and disadvantaged segments of society.

The validity of institutional arrangements was highlighted with due recognition of the complementarity of technical improvements. Institutional arrangements define the “rule of the game” and provide the framework for incentives, i.e. for better use of water. They are also necessary to enforce sanctions, for instance, to reduce mismanagement and to take action when environmental laws and regulations are violated.

Water use rights include also obligations

Water use rights include both rights and obligations. There was wide agreement that water use should be regulated and that a major objective is to regulate and stimulate water use so that the development objectives are achieved. The use of water pricing is one important component of an incentive structure. Institutional arrangements do not only refer to a question about what to do, but also who can do it and how. An interesting example from India illuminated that community-based water management in terms of water harvesting within a catchment can be an appropriate approach to handle water challenges. Water harvesting relies heavily on local efforts and is an example of re-invention of a technology that had been developed and used for centuries in various countries. The case highlighted the need for institutional arrangements through which water use rights of communities are specified.

Institutional arrangements for involvement of civil society organizations and/or the private sector in the actual management of water obviously vary. An example from Cuba illuminated that community involvement may be attempted and promoted through centralized political systems.

Continued emphasis on technical issues

The presentations and discussions revealed that, comparatively speaking, the attention to technical aspects is more pronounced as compared to institutional issues in most countries. In industrialized countries, recent development in membrane technology has made it possible to build sophisticated treatment plants. It is, however, in the developing countries that the most severe water problems are encountered. In an overview of the enormous water challenges in China, the need for systematic national strategies were emphasized.

Political decisions and replicability

Examples from China and South Africa showed that regional development objectives and the achievement of specific national development goals may require that water is allocated to sectors and geographical areas where the output of agricultural production, industrial goods or income per unit of water is lower than it could have been with alternative allocations. These examples also showed that large-scale projects take a considerable time to project and implement and that the need and demand for water at a time

when the project may be implemented are most difficult to calculate or estimate.

Although there is an obvious interest among water planners to search for effective and successful solutions, it was cautioned that replicability is not always to be expected. Prescription does not work, but when conditions are right, the transfer of principles and approaches and also sophisticated technologies is important for improving the effectiveness in water use. Technical arrangements are obviously given high priority in most countries. Insti-

tutional arrangements are seen as important, but the presentations illustrated that they are seldom systematically implemented. One reason is probably that the prevailing social and political system in most countries is not conducive to the institutional arrangements that would be required, whereas technical improvements are tangible and are universally associated with progress. From the discussions it was also clear that the “factor 10” and “factor 4” are not used in any of the countries from where examples were presented. ■

WORKSHOP 2

Balancing Water and Social Challenges through Restructuring of Industry

Chair: Prof. Petr Grau, Czech Republic, Rapporteur: Mrs. Ulla-Britta Fallenius, Sweden

Breaking the link between economic growth and pollution load

Workshop 2 focused on the possibility to break the link between economic growth and environmental damage. It discussed various options to encourage industry and the governments to take adequate measures to reduce the discharges of emissions and wastewater.

Catalysts needed to reconstruct industries

The workshop concluded that the following catalysts for change are of utmost importance to foster change and to restructure industry to emphasize sustainable economic development that meets economic, environmental and social goals.

Catalyst 1: Establish clear and objective rules

Governments must establish clear objectives and consistent rules (policies and programs), based on the conditions in different areas in order to ensure good environmental conditions (i.e. fresh water) and to protect and preserve water resources. The market and every industry leader should support compliance with these clear and consistent rules and water policies.

Catalyst 2: Adequate and reliable measures to abate the pollution load and enforcement of legislation

The governments should enact appropriate legislation which industry can attain, including rules to generate reliable data concerning pollution and use of hazardous chemicals, including heavy metals. The governments and/or local authorities should elaborate standards and/or permits, including realistic timetables for which different industries should comply.

Catalyst 3: Introduce water pricing

In order to promote conservation and efficient use of water, it is essential to introduce and use full and fair water pricing that reflects the full cost of supplying freshwater and treating wastewater. Water pricing need not hurt the poor. Indeed, the failure to charge industry, wealthy people and agriculture, promotes inadequate water management without providing potable water to those who are least able to afford it. Practical experiences show that full and fair water pricing encourages water investment in infrastructure, reduces pollution and encourages the use of water saving practices and technology.

Catalyst 4: Life cycle cost and environmental impact

When making decisions on solutions, all stakeholders should consider the total system costs in order to reach cost-effective solutions to abate pollution and to minimize life-cycle environmental impact (according to the life-cycle assessment concept LCA).

Catalyst 5: Catchment approach

In many countries, there is a lack of freshwater for industry, agriculture and sanitation. It is essential that different countries and regions within countries cooperate and develop legally binding plans for managing water in an integrated manner. An intense focus on those who do the most damage to the environment must be of highest priority. This approach could be supported by discharge fees, which may provide additional funds for remedial measures within the catchment.

Catalyst 6: Reward small-scale solutions

In many cases, small-scale solutions could provide clean water quickly for both small industries and households. It would be a challenge to countries (governments and industries) in the developed countries to sponsor or co-sponsor small-scale projects – projects that help to improve water use and management – and see that they are implemented. Industry should be invited to contribute with “know-how” to these proposed solutions.

Catalyst 7: Market demands

There should be a market consensus in the developed countries not to accept products produced with questionable techniques (i. e. use too much water), are without or have poor pollution abatement, and are using questionable chemicals, heavy metals, etc. The industries and the market in the developed countries should normally ask for a ISO 9000 or ISO 14000 certificate. If not, the producers in the developing countries should show that their production doesn't harm the water and the environment in the surroundings of the plant by using suitable technology.

Catalyst 8: Public awareness and education

The education system, both in the developed and in the developing countries, should provide information about the emerging water crisis and the reasons behind it. It is also important to inform the public and those in the political process that there are solutions and an urgent need to act quickly. This means that there is an important task for the international financial institutions, the United Nations Environment Program, non-governmental organizations, businesses, etc. to assist countries with education and dissemination of global best practices such as the ITT Industries-initiated web site in conjunction with the International Water Academy and Water Environment Federation. ■



Photo: Sean Sprague/Phoenix

A Vietnamese farmer demonstrates a simple, appropriate technology – a pump for irrigating a small-scale farm.

WORKSHOP 3

Innovative Processes in Small-scale Agricultural Production Using Water More Effectively

Chairs: Prof. Rafael Bras, USA, and Dr. Jacob Kijne, UK

Rapporteur: Ms. Line Gordon, Sweden

A vast diversity of innovative thinking

Food security is tightly coupled to water security. Workshop 3 explored innovative small-scale technologies in agriculture and learned that it was quite diverse. Case studies were presented from high as well as low rainfall regions in several different cultural contexts (including China, Zambia, India, Benin, Sweden, Italy and Ethiopia). An underlying tension was the dependence on external inputs to increase crop yields versus self-sufficiency of the small farmer under rainfed agriculture.

Two major themes arose during the workshop:

1. The need for rainfall management that includes both appropriate technologies and land management practices to increase delivery of moisture to the root zone, and small-scale technologies for rainwater harvesting to be used as

supplementary water sources in rainfed agriculture.

2. Conservation and recycling of both water and organic matter to increase the effectiveness and reduce the dependence on expensive inputs like inorganic fertilizer.

Practicing rainwater management

The invited speaker argued that productivity of irrigated and rainfed agriculture can be both improved and brought to parity. The technology to improve agricultural productivity under irrigation and in rainfed agriculture is well known, but the institutions and programs of incentives need to be upgraded worldwide. Much of the yield reduction of irrigated agriculture, e.g. in South Asia, is due to human induced soil degradation, which can be mitigated by improved water management.

Different water harvesting techniques were illustrated. In the semi-arid Gansu

province of China, more than one million small tanks stored water harvested by collecting runoff from the most impervious areas. Crop yields can be increased by as much as 40% with two or three judicious supplementary water applications. In rural India, the use of tanks, farm ponds, contouring and gully detention have been used successfully as methods to harvest rainfall and provide supplementary water to the root zone. In a case study on this technique, acreage under successful cultivation could be increased.

Several cases showed the possibilities of synergetic effects. Once that water availability was secured, farmers could invest in other inputs and/or better technological practices. It was further argued that a small input of water can significantly increase yields, if the timing of application is right.

Recycling of waste can increase the effectiveness of water use

Examples were reported from tropical Africa where recycling of human and animal waste reduced dependence on chemical fertilizers and pesticides. Several people during the discussion pointed at the need to get more information about issues related to human health and the control of pathogens, particularly viral, in the recycling

systems described above. The workshop felt a strong need for a multidisciplinary discussion on ecological sanitation. It was suggested that the Stockholm Water Symposium provide a forum for such a discussion in a workshop next year. Although solutions have to be adapted to local circumstances, some general guidelines and definitions in this area are needed.

Lack of proper documentation and the need for a strong case

An abundance of success stories were heard in the workshop, and it was emphasized that small-scale solutions can make a substantial contribution to food and water security. This raised the important question why highly productive, innovative small-scale agricultural practices were not brought up in the World Water Vision, nor seem to be of interest for donors, and governments. A couple of different reasons were suggested. These agricultural practices have not been properly documented and are seldom part of the curriculum taught at universities. Moreover, full economic costs are seldom properly documented and few scientific studies are made of side effects of these practices.

Conclusions

The workshop concluded

- Simple technologies, appropriate for subsistence agriculture, exist that would increase the delivery of moisture to the root zone during irrigation or rainfall. Crop yields can be increased at this level.
- There is no best practice. Instead of searching for best available technology, we should look for technologies that can be adapted to local circumstances.
- A big challenge is to establish the educational programs and incentives to help the small farmer implement the available technologies.
- Small-scale rainfed agriculture is viable with intelligent utilization of harvested rainfall.
- Conservation and recycling should be an operating principle to the small farmer.
- There is a need for reliable data in terms of finance and labor requirements as well as on the expected benefits for small scale farmers.
- It should also be clear, that these small operations at the subsistence level couldn't solve the whole large-scale problems of food production for a fast growing world population. Trade has to be a complementary solution. ■

Responsibilities, Rules and Roles Linked to “Human Rights”

Chairs: Dr. Maude Barlow, Canada, and Dr. Marna de Lange, South Africa, Rapporteur: Prof. Peter Söderbaum, Sweden

Human rights, legal framework and cultural context

In this workshop cases were presented from South Africa, Estonia, Jordan, India and Mexico. Recent developments in South Africa suggested that laws concerning water that refer to human rights can play an important role in social change processes. National governments have a role in securing basic needs of water. Human rights could be recognized in the constitution of a nation or in other laws. The legal framework has to be (or be made) compatible with the cultural context in a country. Introducing a new law has to go together with cultural change that makes the law function.

Ethical issues are involved

Reference to human rights raises issues of ethics. Reasoning instead exclusively in terms of markets and water as a commodity may not raise these ethical issues. A human rights approach to water also points to democracy and power as important issues. The construction of dams in India (Sardar Sarovar project) was presented as a case where difficult decisions are faced concerning resettlements of nomads. Do these people have a right to water at the place where they have lived for generations, or is it enough to provide them with water after resettlement? No agreement was reached concerning this issue. Some were skeptical to the idea of building dams as a way of “solving” water availability problems.

Human rights to water should be seen in connection with human rights to information and participation. Transparency and availability of information become key issues.

Rights and responsibility of people and business

Issues of rights and responsibility have to be raised concerning all actors influencing water allocation issues, governments and businesses included. In fact any discussion about rights and responsibilities refers to relationships between actors; who has a right and who is responsible to observe or secure that right? Even privatization can be discussed in this light. The company has responsibilities in relation to the rights (and

responsibilities) of the people. The debate about the social responsibility of business is therefore important.

Attention was drawn also to the international legal framework connected for instance with the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO). Transnational corporations can sue national governments for protectionism if they make decisions about laws that may hinder international trade or otherwise impede the interests of global corporations.

Institutionalization of human rights to complement market approaches

Not all ethical issues concern human beings. The workshop agreed about the necessity of considering our relationships to other species and to ecosystems, but not how to do this. The present tendencies to colonize all kinds of land and water for human purposes have to be counteracted. The space left for other species should be increased rather than reduced. There is a need for environmental ethics in addition to human ethics.

The observance or institutionalization of human rights represents a questioning of the idea of making trade offs in monetary terms or otherwise. Some rights such as those of indigenous people should be secured and not traded at all in relation to other interests. And by raising issues of ethics, a human rights approach will probably also in other ways influence how we look at decisions concerning water management. ■

A presentation from India demonstrated how dam construction raised difficult questions about the resettlement of nomads.





Women have two main appearances in relation to water management: as professionals in water resources management, and as users and custodians of groups of users and stakeholders.

WORKSHOP 5

Feminization of Water Management

Chair: Prof. James J. Morgan, USA, Rapporteur: Prof. Malin Falkenmark, Sweden

Making proper use of capacity and skill of women

The starting point for the presentations and discussions was a recognition that the capacity and skill of women through feminization of water management are not made proper use of in large parts of the world due to cultural, religious and other barriers. In most cultural settings the agenda is set by men, and the World Water Vision, presented at the World Water Forum in the Hague in March 2000, was a vision of men. Basically, women have two main appearances in relation to water management: the one as users, custodians of large groups of users and local stakeholders; and the other as professionals in water resources management and as participants in societal problem analysis and decision making. Women's mindsets are often different from men's, characterized by a deep feeling for the next generation, and reflecting a preference to peacemaking and sharing rather than conflicts.

Feminization – a component of the hydrosocial contract

The invited speaker developed a conceptual background to the issue, based on policy science theory as applied to water resources management. Two main feminization phases can then be distinguished. Once that the initial water surplus phase, when there is still plenty of water to meet the needs, reaches an end, a first transition takes place: the hydraulic mission is born with supply side augmentation as main strategy. This is an

era of defeminization, dominated by taming of nature and male construction achievements. With the later entering into a water deficit phase, when there is no more water to be mobilized to meet the still rising needs, a second transition takes place. The social conscience is born with refeminization as part of a restructuring of power relations and unlocking of social forces. The general goal is to increase human security.

Women – no homogenous group

The current water discourse is mainly hardware focused, male dominated, and not yet sufficiently challenged. In many developing countries, the financial and legal status of women often results in their being handled as legal minorities, often illiterate, and exponents of a feminization of poverty. Head counting and gender equity are im-

portant on the local level, but in the societal hierarchy there tends to be fewer and fewer women at higher levels of water management and societal decision making. As specialists and senior advisers, women tend to have the role of technical expertise and are more or less indistinguishable from men. It is basically at the upper generalist and decision making levels in society that female views can more effectively be entered as inputs in the process. The myth of women as a homogenous group where emancipation is universally desirable has to be challenged – cultural differences are large.

How to transmit the ideas of women

Different aspects of feminization of water resources management were presented in a series of short presentations from India, Sri Lanka and Uganda. The discussion made clear that to increase water management efficiency, the needs of women have to be expressed in a process of participation rather than just information. They have to be consulted about their choices but also be able to influence the design of water equipment. Male assumptions of women's needs are often deficient, as illustrated from India in regard to water needs and platforms for washing.

It was concluded that the world is still at a very early stage of refeminization, with a far from streamlined discourse. Primary school education on water was considered essential to prepare young women to a take off. Capacity building and education are key conditions for participation in management work. Two time horizons have to be distinguished:

- the immediate one, involving on the one hand training in different sectors, and on the other hand teacher awareness programs so that water awareness can be generated in schools; and
- a long term one aiming at getting more



girl students, and more professional women, through the introduction of incentives, scholarship programs, etc.

Enhancement of women participation

It is clear that feminization of water management is still in the quantity domain with headcounting, token women on committees, etc. A rich cultural heritage exists with

involvement in women rituals, to which has now to be added participation in water management decisions as a next important stage of participation. Women have to be consulted on their choices, and to influence proposed designs of water equipment. Education on the life support system, the functioning of the water cycle and the ways in which water is used, etc., should be a first

central step on the primary school level, in which community level investments are needed. Networking of professional women is starting in several regions, with the aim of strengthening their interests. Women would have the largest influence close to the policy making, where a critical mass has to be built up. Access to that level is important. ■

WORKSHOP 6

Making Water Everybody's Business – the Educational Challenge

Chair: Prof. Madhav A. Chitale, India, assisted by Prof. Gede Raka, Indonesia,

Rapporteur: Prof. Klas Cederwall, Sweden

Education on all societal levels

Water awareness and communication are crucial for developing water security. New ways of thinking will open up for more effective handling of water-related problems. It is a matter of getting better knowledge and gaining insight. Education must meet both general needs and needs from different professions. The basic educational issues are: what shall we learn, how shall we teach and why are we actually doing it?

The educational challenge is highly complex

The different studies presented in the workshop covered a large variety of topics but did not allow the identification of a simple structure that indicates important components and directions in the development of effective and innovative education related to water and water management.

As a consequence, specific aspects of “the educational challenge” should be covered in greater detail in a coming symposium. Systematically looking for speakers who can share with us their experience remains an important task in order to stimulate further efforts in developing educational capacity in water resources management.

The general discussion concentrated on the following five questions:

- How much should we rely on formal education?
- What is the role of NGOs and what is their responsibility in education?
- How do we handle different hydrological regimes and other cross-country trends?
- Impacts of the Information Technology revolution?
- Significance of cultural, spiritual and ethical values in society and their relation to water?

Also, aspects with other dimensions were brought up, which the workshop felt had relevance for several of the above five issues such as:

- Story telling: promoting physical understanding, providing good metaphors and also stimulating with successful examples.
- Develop skills to solve problems: identify, analyze and look at different angles.
- Education based on realistic information.
- Integrated approaches: difficult but crucial to achieve in water resources management and should therefore also be applied in education.

Conclusions

Formal education on different levels can take advantage of better co-operation with

stakeholders (societal interests with schools seen as part of society).

NGOs should in that context better consider the realities of economic activities in society. More tolerance is needed with respect to e.g. industrial production that can improve environmental performance.

Culture is the means by which we humans adapt to challenges of a diverse global environment while civilization is the spirit in which humans socialize with each other.

The spirit of conservation and saving is deeply rooted in many cultures as a contrast to the lifestyle of developed countries where spending and economic growth are advocated. This means that children are normally brought up with a sound relation to water and water management, which they may lose when observing the lifestyle of adults.

Education in water resources can benefit from integration of technical, socio-economic and cultural components in problem-based projects.

Information technology can appear in many different shapes as important devices for promoting broad and effective communication. ■

The workshop attempted to answer some basic educational questions: what shall we learn, how shall we teach, and why are we actually doing it?



Towards a Recycling Society: Systems Approach to Small-scale Reuse of Human Waste

Chair: Prof. Ausaf-ur Rahman, Singapore, Rapporteur: Dr Jan-Olof Drangert, Sweden

Hygienisation and reuse of human waste

The objective and focus of the workshop deliberations was on simplifying the hygienisation of urine and feces and its reuse in food production by using urine-diverting toilets, as well as on innovative ways to recycle sewage after various stages of treatment. A wide range of experiences of closing of water and nutrient loops were presented to the workshop. The leading idea was to view human waste as a resource that is returned to food production and nature. This approach will enhance the sustainability of human activities by saving water and recycling nutrients.

Inspiration for new thinking in sanitation originates from present challenges of squalid conditions in many societies, population increase, unwise use of water and the need for food security. In the last few years a number of ecological sanitation projects have been implemented in several countries, and thereby information is more readily available. Hygiene and health aspects were also addressed. Storage of urine for six months has been found to be enough to eradicate bacteria, viruses and helminths. Fecal material is also hygienized by storing in a compost for six months. Other contributions focused on food-crop contamination in sewage farming (Morocco) and application of raw sewage whereas treated wastewater and freshwater did not contaminate the crops. Wetland treatment of wastewater proved to lower nutrient loads and assisted in reducing the health risks (Poland, Egypt and India). It was emphasized that incidence of health problems related to eco-san are limited to single families, while sewage systems may affect large groups.

Attitudes to reuse

Attitudes towards urine diversion and reuse were touched upon in some papers. Popular acceptance of short loops at the household level was reported from Zimbabwe and Ethiopia. Here, home gardens are fertilized with urine, and crops react differently to different application patterns (Zimbabwe). Often, degradable organic refuse is added to the compost of fecal matter. During the discussion the issue of religious and cultural taboos was raised. The example of Ethiopia was given where

the expected resistance from the predominant Muslim community was not found – instead there was widespread acceptance. Home-visits and monitoring of the local systems was considered important to secure success.

Contamination and wastewater treatment

Urine-diverting toilets are manufactured locally and represent a range from mud bricks to porcelain chairs (China, Ethiopia, Mexico and Zimbabwe). The cost of the Chinese urine-diverting squatting pan in plastic is less than 10 USD. The Egyptian example of treating sewage in ponds compares favorably with the conventional system that is some ten times as expensive. While non-serviced areas can rarely afford conventional systems, ecological systems may even provide some income from the resource saving and reuse. Wetland/pond treatment of sewage may overcome some shortcomings of the linear system, but not such factors as high cost, huge water consumption, non-treatment of antibiotics and heavy metals. By minimizing the input (esp. water and chemicals) into human activities, the problem with waste treatment is reduced.

Local citizens help install a latrine in Bangladesh. Other Asian countries, like Vietnam and China, officially endorse small-scale urine diversion and agricultural use of human waste.



Photo: Sean Sprague/Phoenix

Bottom-up approach

The institutional issues were partly addressed by the speakers. The approach advocated by the Collaborative Council and others is that of starting to think of the household and their living conditions. If the human waste cannot be handled at that level, one moves on to the neighborhood level, etc. This bottom-up approach is in part a response to the challenge of lack of financial and other resources. Countries like Vietnam and China officially endorse urine diversion and agricultural use of human waste.

Consultants behind the times

The panel discussion was lively, thought-provoking and fruitful. While conventional sewage treatment plants are extensively built throughout the world, there is modest proliferation of dry systems. Conventional systems are still the only ones advocated by consultants and lending institutions. A “business as usual” approach would not benefit the poor, and would be an expensive way leading to inertia when it comes to later modification. This approach does not solve the sanitation problems; instead, leaking sewers may aggravate them. There is an obvious need to recognize and to plan for parallel or complementing systems and to get away from thinking in one, single system for all conditions.

Simple, Small-scale and Appropriate Technology for Potable Water

Chair: Dr. Ravi Narayanan, Water Aid, Rapporteur: Dr. Bengt Hultman, Sweden



In Kenya, rainwater is harvested from roofs and stored in tanks, a simple technical solution that can help solve water quality and quantity problems, and reduce time needed to fetch water.

Water supply problems to address

Water scarcity, deficient water quality and lack of suitable technical solutions are major problems to tackle water supply to a large part of the world population. In addition the solutions should be affordable and meet public acceptance.

Water-borne diseases are a major problem in many countries and in general many of the centralized treatment plants in the world are trying to reduce the use of chemicals for disinfection due to costs and different minor rest products. An interesting alternative is the use of ultraviolet (UV) irradiation as the main, disinfectant, and two papers described different aspects of UV irradiation, including mechanisms and design. Excessive concentration of fluoride in groundwater is a severe health problem in several areas as East Africa, India and China. In India, only, excessive fluoride concentrations cause health problems such as acute swelling of bones for more than 60 million people. Lack of access of water with adequate quality has increased home treatment systems in Serbia from about 6% in 1994 to 10% in 1995 and an evaluation of these systems was described.

Rain harvesting in Sri Lanka

In Sri Lanka only 14% of the rural population – nearly 70% of the total population – is served by piped water. The technical so-

lution to supply water during dry seasons is rain harvesting during the rain periods and local storage of the collected water. Runoff was used for instance from roofs, followed after a device to remove the flush by filtration and the storage in tanks. The tanks were either above ground tanks built by ferro-cement (about 7.5 m³) or underground tanks built by brick (about 5 m³).

Ultraviolet treatment

The UV emission spectrum and UV intensity both play an important role in killing microorganisms. Much development has occurred since the development of monochromatic UV light from low pressure mercury vapor lamps at the end of the 19th century, followed by second generation UV lamps known as medium pressure lamps over 25 years ago, and finally the present third generation lamps that combine the high UV efficiency of low pressure lamps with the multiple germicidal effects of the wide-band output from medium pressure lamps. Much attention must be given to the ability of microorganisms to recover from or repair UV damage. Combined damage of DNA, enzymes and proteins at UV treatment is therefore essential for an efficient disinfection.

Electricity is necessary for UV irradiation from lamps. About 1 billion people are currently deprived of both a safe water sup-

ply and electricity. Simple solutions for the supply of electricity were described of the use of specially made pico hydraulic turbines or of solar powered systems. The combined use of electricity generation and UV lamps enables small villages to achieve safe water disinfection.

Groundwater with excessive fluoride concentration

Many technical methods to remove fluoride from waters exist such as adsorption onto alumina or treatment with lime and alum. Exchange capacity is, however, rapidly exhausted due to high bicarbonate contents in fluoride-rich groundwater and technical solutions for fluoride removal are in general costly. External supply of calcium from gypsum or addition of sulfuric acid to dissolve calcium are possible methods to reduce the fluoride concentration. Gypsum application to part of a recharge area of a well showed a reduction of the fluoride concentration from 5 mg/l to 2.5 mg/l of fluoride. A combination of water harvesting for dilution and gypsum treatment should be more efficient. An increased concentration of calcium in drinking water counters the uptake of fluoride in the intestine.

Home treatment systems

Technology used in water home treatment systems in Serbia usually includes mechanical filtration followed by activated carbon, reverse osmosis, UV irradiation and combined technologies. Reverse osmosis was considered to be the most efficient technology. Much better education is needed for the population using the home treatment systems on operation and maintenance in order to avoid serious consequences on health.

Participation and education

The papers in the session showed that rain harvesting is an important tool to store water or to dilute a pollutant in groundwater as fluoride and that simple solutions with UV treatment or additions to recharge areas are cost effective. Technical solutions must be combined with education and social impacts. The need for education was shown for operation and maintenance of the home treatment systems. Participation by the people was important in building the local rain harvesting systems in Sri Lanka. These systems not only solved important water quality and quantity problems but also reduced the time to fetch water and made it possible to use small gardens. Appropriate methods for production of potable water should, thus, use a multidisciplinary approach. ■

Aral Sea Seminar Emphasizes Initiatives and Cooperation for Water Security

“Water shortage is not the problem for the Aral Sea, it is the salt,” stated Mr. Fritz Verhoog from UNESCO and pointed out one of the various aspects being discussed lively at “Water Security – Opportunity for Development and Cooperation in the Aral Sea Area,” a seminar held Sunday, August 13, before the Stockholm Water Symposium. The seminar, which looked at both qualitative and quantitative perspectives, was co-convened by the

Royal Swedish Academy of Sciences and the United Nations Development Fund for Women.

ARAL SEA SEMINAR

The Aral Sea, which belongs to Uzbekistan and Kazakhstan in Middle Asia, has suffered from increasing water depletion for many years. Increased irrigation along the sea’s most important catchment rivers, the Amu-Darja and the Syr-Darja, has led to a 50% decrease in surface area and one fifth of total water volume from 1960 until today.

The consequences are diverse

“Apart from the salt content it is also the chemical toxification such as pesticides, insecticides and fertilizers leading to an overall bad water quality,” explained Dr. Nick Aladin from the Russian Federation. He discussed saving the northern part of the Aral Sea by separating it from the south and, through that, obtaining significant salt reduction in the north. Representatives from the Institute for Water Management in Uzbekistan reported on the pronounced linkages between very degraded water quality and child mortality in the region. Mr. Tony Allan from the University of London pointed out the very limited socio-economic capability in the countries to cope with the situation.

But initiatives and projects have begun to be established, and awareness has been sharpened. Vladimir Sokolov from the Science Information Centre in Uzbekistan presented a new database on Aral Sea data which includes information on water quality and climate, but even on industry and economy in the region. Also, the World Bank serves as an umbrella organization for various projects and activities, as does the United Nations. The Baltic Sea cooperation model was presented as an idea for

future cooperation, and special emphasis was taken on the importance that all partners concerned have a right to give their opinion on the topics.

“Still,” as the Union for the Defence of the Aral Sea soberly stated, “those running the economy today are still those having lead us into the catastrophe.” It stressed continued awareness building through like-minded seminars, gathering of concrete

knowledge on what is happening in the region, and active involvement of non-governmental organizations. SIWI stated its interest in ongoing dialogue and awareness building and the possibility for future Aral Sea seminars in Stockholm during the World Water Week.

About 70 persons attended the seminar, including representatives from the Aral Sea area, Global Water Partnership, Danish Environmental Development Assistance, a Japanese institute and an Australian university with research projects dealing with salinization problems. ■



Young Professionals Propose “Future Generation Impact Assessment”

Modern, civilised society is willing to spend hundreds of billions dollar on building space stations, developing “Star Wars” technologies and exploring other planets in the search of water – all while millions of people die each year due to preventable water related diseases.

But instead of challenging the necessity of other scientific fields, participants at the SIWI Seminar for Young Scientists on August 13 did raise some fundamental questions about the capacity of water professionals to mobilize political and financial support for such a life determining issue as improved water management.

Titled “Hydrosolidarity – Intergenerational Challenges”, the seminar focused on long-term challenges from both a technical as well as an institutional perspective. Keynote speakers focused mainly on institutional aspects, and presented their views

on changes they saw as being crucial, but also provided practical examples of successful work done, for example in Southern Africa through Southern Africa Development Cooperation. A main point was that agencies need to change in their approach towards

water users and acquire new skills to deal with multi-stakeholder processes (people management, outreach, economic/administrative skills).

Water users, on the other hand, may “lose” existing rights (e.g. cheap water), but gain decision-making power. Other stakeholders also enter the scene, such as environmental and social non-governmental organizations (NGOs). Policy change

SEMINAR FOR YOUNG PROFESSIONALS

may be painful for existing agencies as they may see few incentives to carry through changes. Such incentives must therefore be clearly specified.

Through these presentations, and the extensive discussions among participants, both in smaller working groups and in plenary sessions, it became clear that long-term challenges in water management were not so much linked to classical scientific or technical aspects, but rather to institutional capacities. A good example is that water pollution, although specified in the outset of the seminar as a typical long-term issue, was not primarily identified as a key problem in the discussions. This was not a result of a lack of appreciation of the huge threat to humanity posed by water pollution, but rather the recognition that water pollution, as water scarcity, climate change and other similar issues, are symptoms of much more complex and ultimate societal problems. That is why the focus turned toward discussing what was perceived as sources to the complex causal cause-effect links, namely issues linked to human behaviour, political support and managerial and institutional structures.

Such a shift in focus - from hydrology and technology towards how we deal with people, was not a novelty for the year 2000 SIWI Seminar for Young Water Professionals. In the five years that the Seminar has been conducted, it has in fact become clear that participants do not primarily wish to discuss science and technology in isolation.

The challenges and the underlying causes

The complexity of integrated water resources management is not always well understood, and can create a sense of hopelessness among professionals. To make it operational, on a realistic level, therefore becomes even more important. Long-term commitments among various professionals are probably more important than a blue revolution. The involvement of new actors, in itself perceived as something very positive, further adds to this complexity and also adds new dimensions on communication skills. At the same time, we drown in data and information, but we have limited capacity to assess the quality of such information.

As discussed above, many of the issues traditionally seen as the fundamental problems relating to water management, are more a result of much deeper underlying aspects of failures in society. This can be "classical issues", such as population growth, poverty, lack of awareness, institutional fragmentation, but also more "debatable"

issues linked to human/institutional aspects, such as a fear of changing existing hierarchical structures, not being able to offer enough incentives for change, and too much focus on urgent issues (e.g., catastrophes) rather than important issues.

Some specific proposals

It is too easy to blame earlier generations for the problems we are facing today. It is much more difficult to come up with specific proposals. A lesson learned from the Young professionals' meeting was that although the aim has been to be action oriented and specific, the output often becomes too wide and unspecific in its recommendations. At this year's seminar, some distinct topics crystallised as needing further attention, including:

- Discuss ethical dimensions in policy making.
- Have a multigenerational network develop the framework for a "Future Generation Impact Assessment" (FGIA).
- Lack of true dialogue – how do we get away from the one-way type of communication typical of today and instead build systems allowing for true multi-stakeholder dialogue?
- Formulate the "perfect curriculum" for meeting the challenges of today and tomorrow.

Additional strong focus will therefore be needed on how to initiate political, management and institutional changes. ■

Eco-san Workshop Participants Urge Reverse in Linear Thinking

“Reverse the unconscious pattern of linear thinking” was one of the key themes that resonated among 74 participants of the workshop entitled “Ecological Sanitation in a Recycling Society” during last August’s World Water Week in Stockholm. Being a joint initiative by the United Nations Development Program, the Swedish International Development

Agency, and SIWI, the workshop provided a forum for researchers and practitioners to review dry sanitation systems used in the past as well as present ongoing case studies from Mexico,

SIDA / UNDP
SIWI WORKSHOP

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China, Zimbabwe, India and Ethiopia, and to clearly identify major obstacles for a change to more appropriate and environmentally sound sanitation systems.

"The participants became so involved in constructive discussions that the meeting had to be prolonged by one hour. The meeting could have continued even longer if the seminar room had not been booked for another purpose," said Ingvar Andersson from UNDP in summarizing his impressions of the atmosphere.

Tasks of a recycling society

"Three billion people are today without access to decent latrines – a disgrace to human society and contributing to the death of more than 1.8 million children per year," Andersson said. "It can bluntly be stated that the large majority of cities and communities of the Third World will neither have the money nor the quantities of water required to solve their sanitation problems with toilets and sewers. Declining soil fertility and degraded land are other life-threatening problems facing poor people in the Third World. The nutrients in human urine and the humus of composted excreta must be used and recycled to increase agricultural productivity and food security."

A conscience should be generated that human excreta actually are a resource, valuable to improve land productivity and contributing to food security and nutrition. Ecological sanitation can therefore serve as the missing link to sustainable urban development, which furthermore profits from reduced disease transmission and disposal of wastes.

The perspective

An experienced group of professionals from sectors such as urban planning, public health, nutrition, agronomy, education, sanitary engineering, microbiology, sociology, development economics agreed that there is still a big need for research to further develop affordable and sustainable solutions, based on an eco-system approach, for the management of human excreta, and coverage of ecological sanitation needs to be increased.

Still, the main challenge remains in our minds. Linear approaches to problems, in which resources are used and converted into wastes, only to be disposed of, represent a failure in human ingenuity and a flaw in technology design. ■

Multinational Hydrosolidarity Requires the Input of Many

Water Security for Multinational Water Systems – Opportunity for Development, a day-long SIWI Seminar held August 19, addressed "equitable utilization" between upstream and downstream users in river basins shared by two or more countries. Worldwide, some 60 percent of the populations live in a shared river basin.

In 1999, a similar seminar focused on upstream/downstream issues in national river basins. Internationally, the issue is more complex.

"In multinational river basins, the problematique is intensified by at least one order of magnitude by the political and hydrostrategic interests of the co-basin countries," said Prof. Malin Falkenmark of SIWI. She added that since human activities are both water impacting and water dependent, conflicts of interest are unavoidable, especially between water impacting activities upstream and water dependent activities downstream.

Speakers at the seminar, which will also be summarized in a new SIWI report (see page 16), discussed the current trends in management of international water basins. Dr. Jerry Delli Priscoli discussed how the history for organizing and community building around water is much greater than that of warfare. Despite this, said Prof. Asit Biswas of Mexico, management of international waters is becoming a highly charged political issue, fueled by population growth and escalating water scarcity. Nonetheless, said Dr. Delli Priscoli, "security means freedom from danger, from fear or anxiety, from want or deprivation." Increasing water problems can lead to greater integration of efforts between nations, and can be a catalyst for peace.

In discussing the scale (and type) of water conflicts, Dr. Aron Wolf from the

USA discussed his efforts to use advanced GIS overlay techniques to identify which transboundary basins that are at risk, as seen in a 5- to 10-year perspective, and to initiate preventive diplomacy. The decisive characteristic of basins at risk, he says, is whether the rate of change is larger than the institutional capacity to absorb that change.

Regarding types of conflicts of interest, much discussion in the past has focused on downstream interests, but seminar attendees also noted that the issue of upstream rights

is lagging behind. Water quality issues, too, have been less contro-

versial that water quantity issues, but that will change, particularly in the developing world.

Presented case studies at the seminar included the Mekong River, the River Plata, rivers and aquifers in the Middle East, the Okavango River and the Danube River. Another seminar highlight was the focus on negotiation success stories. Experts must explain to politicians what conflicts are about, but the packaging of groups involved is crucial to achieve a dialogue.

"Water is too important to be monopolized by water scientists, engineers, major companies in the water sector, diplomats, military strategists, and politicians," said Tor Wennesland from Norway.

As in national river basins, the ultimate water management goal, according to seminar participants, must be a hydrosolidarity between all those living in the basin. To achieve this, a social capability to adjust to existing natural resources constraints must exist in the different co-basin countries. ■

SIWI SEMINAR



SIWI – IWA Collaboration Grows

A Conversation with Anthony Milburn, International Water Association Executive Director

This month, the proceedings from the 10th Stockholm Water Symposium are being published. For the first time, the proceedings are being produced by SIWI through an agreement reached with the London-based International Water Association (IWA) through its publishing company, IWA Publishing. The proceedings will be distributed as part of IWA's Water Science & Technology series. Stockholm Water Front spoke recently with Mr. Anthony Milburn, IWA Executive Director, regarding this new arrangement as well as the long history between the Stockholm activities, the recently formed IWA, and its two predecessors, the International Association on Water Quality (IAWQ) and the International Water Supply Association (IWSA).

"...we wanted our members and the Water Science & Technology readers, who are located in many hundreds of universities, companies, and utilities around the world, to see this excellent material coming out of Stockholm..."

Why has IWA decided to co-publish the Stockholm Water Symposium proceedings?

It has long been my view that the material produced at the Stockholm Water Symposium is of the highest quality and needed to be disseminated to a wide audience via a prestigious publication. Also, we wanted our members and the Water Science & Technology readers, who are located in many hundreds of universities, companies, and utilities around the world, to see this excellent material coming out of Stockholm, particularly as it is an aid in understanding the strategic issues and the latest state of the art in a significant number of water concerns – not just water supply and sanitation, but the whole range of water issues.

Over and above that, IWA and IWA's predecessors have had a long and friendly association with the Stockholm activities that extends to the very beginning, and we were anxious to support the symposium organizers to get a better dissemination of the conference proceedings.

What additional benefits are there?

Beyond those already stated, the benefits to SIWI are that the range of marketing contacts that IWA Publishing has is really very substantial, and it is a publishing company that specializes in water and other environmentally related issues.

You mentioned the "long association" with the Stockholm activities. Please elaborate.

The history goes back to the late 1980s, when Sven-Erik Skogsfors, then of the Stockholm Water Company, and Bo Krantz, then of the Stockholm Water Foundation, came to a governing board meeting of IAWQ and IWSA with the proposal to set up the Stockholm Water Prize and Stockholm Water Symposium, and received the unanimous and enthusiastic backing of both boards. Both IAWQ and IWSA have had members sit on the Stockholm Water Prize Nominating Committee, and have had executive directors and presidents of the two associations participate actively as keynote speakers and chairs of workshops and sessions. So, you can say that we're really woven into the fabric of the World Water Week.

And even the official union between IAWQ and IWSA has a Stockholm connection, right?

That's right. It was during the Stockholm Water Prize Award Ceremony and Banquet in 1999 that the official signing ceremony took place involving the presidents and executive directors of the associations, which formalized the birth of IWA. We were further privileged that His Majesty the King of Sweden witnessed the signing ceremony.

Aside from the specifics mentioned above, what is the overall benefit from the collaboration?

Many policy makers, who are represented at the Symposium or involved with SIWI, need assistance with formulating sound water policies. Such water policies will be immeasurably better when they are founded on sound science and best current operational practices. IWA's members are the custodians of the sound science and best practice. SIWI is creating a valuable bridge between IWA members and the policy makers.

Do you see even more collaboration with SIWI?



IWA Executive Director Anthony Milburn chaired the Opening Session at the 2000 Stockholm Water Symposium.

Yes. Going back to the IWA Board meeting in Paris last July, we were discussing the future strategic direction of the International Water Association, including our projected role as an advocate for the water and sanitation sector. We commissioned SIWI to prepare a report on principal and emerging policies in water management, those which impact the IWA's interests, who are the main drivers of those policies, and where should IWA position itself in relation to them. It was an excellent report that was presented to the

"So, the link between SIWI and IWA will be very strong and I see a significant, mutually supportive interest."

board. In taking it into account along with the Hague results, and in deciding how to get the organization to respond, one might see how IWA could call again on SIWI to examine more closely how integrated urban water management fits in with integrated water resources management, a SIWI niche. This is especially so given that in many lower income countries, a lot of integrated water resources management in selected basins will be based around the needs of the bigger urban areas." So, the link between the two will be very strong, and I see a significant, mutually supportive interest. ■

Stockholm Water Prize Announcement is March 22!

The winner of the 2001 Stockholm Water Prize, the leading international award for outstanding achievements on behalf of the world's water, will be announced in Stockholm on March 22.

The \$150,000 award is being presented for the 11th time to an individual, institution, organization or company that has made a substantial contribution to the preservation, enhancement and availability of the world's water resources. The prize recognizes outstanding research, action or education that increases knowledge of water as a resource and protects its usability for all life.

On November 29-30, the Prize Nominating Committee met in Stockholm to deliberate over the nominations. The Com-

mittee includes two new members: Prof. (Emeritus) Torkild Carstens of the SINTEF Civil and Environmental Engineering Department of Water Resources in Oslo, Norway, and Dr. Harald Rosenthal of the Institute of Marine Science, Kiel, Germany.

The announcement will be made during a press conference at the Stockholm City Hall on March 22, the UN World Day for Water, and posted simultaneously along with photos and related information at www.siwi.org.

His Majesty King Carl XVI Gustaf of Sweden is the patron of the Stockholm Water Prize and will present the award at a ceremony in the Stockholm City Hall on August 16, 2001. ■



The winner of the 2001 Stockholm Water Prize will be announced March 22, 2001.

Industry Water Award Nominees Sought

Companies that have contributed to pollution elimination or reduced freshwater consumption through innovative programs, policies, processes or products now have the opportunity to nominate themselves for the prestigious Stockholm Industry Water Award.



Until February 28, 2001, nominations will be accepted from businesses and industries whose resources, competencies and experiences have helped to reduce the effects of the escalating world water crisis. The Stockholm Water Foundation presents the award in collaboration with the Royal Swedish Academy of Engineering Sciences and the World Business Council for Sustainable Development.

Founded to stimulate business contributions to sustainable water development, the award recognizes:

- innovative corporate development of water and wastewater process technologies,
- environmental improvement through improved performance in production processes,
- new products or technologies, and

- other significant corporate contributions to helping improve the world water situation.

The award will be presented August 16, 2001, during the World Water Week in Stockholm.

Selecting the winning company will be an international nominating committee established by the Royal Swedish Academy of Engineering Sciences. Members include representatives from academia, the business world, international water organizations, and the water science sector. SIWI serves as secretariat for the award.

The first Stockholm Industry Water Award was presented in 2000 to Northumbrian Water Ltd. of the United Kingdom in honor of forward-looking initiatives that achieved a cost-effective, environmentally friendly regional solution to sewage treatment and disposal.



For nomination forms and criteria, contact SIWI, Sveavägen 59, SE-113 59 Stockholm, Sweden, tel +46 8 522 139 60, fax +46 8 522 139 61, or e-mail siwi@siwi.org.

Professor Malin Falkenmark joins Club of Tokyo

The first meeting of the "Club of Tokyo for a Global Water Policy Dialogue" took place in Tokyo on September 25-26, 2000. The Club of Tokyo, which includes Prof. Malin Falkenmark of SIWI, has been established as an informal network of the most influential water and development professionals of the world, who can influence and informally give a direction to global discussions and agenda on water.

Fourteen leading international experts on water and development issues, and policy-makers were invited to join this exclusive Club. The members were selected after a peer group survey, and the simple criteria used for selection was that they were all considered to be the best and most influential by their peer group. The Club will meet once a year to hold discussions on what they consider are the most important water and water-related issues for the next 10 years, and how these can be resolved efficiently and in a timely manner. All the members were invited to join the Club in their personal capacities. The Club is not affiliated to any institution. ■

SJWP Agreements Signed with Chile, Estonia and Lithuania

The fifth international Stockholm Junior Water Prize competition, which culminates with the prize award ceremony in Stockholm on August 14, 2001, will include three new participating countries.

This Fall, the Stockholm Water Foundation signed new participation agreements with the Ministerio de Obras Publicas in Chile, SEI-Tallinn in Estonia and Nvejonė Environmental Club in Lithuania. The three organizations have each agreed to arrange a Stockholm Junior Water Prize national contest and to send their national winner to Stockholm for the international event.

In addition, discussions are underway with organizations in Canada, New Zealand and Norway. With the potential addition of up to six countries, the total number of participating nations next summer could be as many as 23.

2000 SJWP winner gains notice

In addition to the increasing number of participating countries, the growth of the Stockholm Junior Water Prize into a respected, international competition and award can also be seen in other ways.

For example the research that won Ms. Ashley Mulroy the 2000 Stockholm Junior Water Prize has also brought herself – and the subject of residual antibiotics being found in public water supplies – much attention in the US media recently. In November, both USA Today, the largest circulation daily newspaper in the United States, and the Associated Press, the most prominent wire

news service, featured Ms. Mulroy in articles exploring her cutting-edge research and related issues.

Finding time for interviews has been one of the many activities that Ms. Mulroy has been involved in during the busy months since she won the award in August.

In addition to sending in her college applications, the high school senior from Moundsville, West Virginia, in the USA was a distinguished guest at WEFTEC 2000, the annual conference and exposition of the Water Environment Federation, the US National Organizer. On top of that, according to her teacher, Mr. John Bisbocci, she has found time to star on her high school's cross country team.

2001 contest update

In countries throughout the world, students are hard at work on projects that they will submit for their national Stockholm Junior Water Prize competition. Most national competitions will take place between March and June of 2001. National winners' projects are due in Stockholm by June 15, 2001, after which the international Nominating Committee will review them in advance of the August competition.

To help National Organizations facilitate their contests, SIWI has prepared and distributed the 2001 Stockholm Junior Water Prize Handbook, which includes information on organizing, administrating and marketing a National Contest.

For more information, visit www.siwi.org/sjwp.html.

Important Dates – 2001

February 15

- Abstract Deadline for the 2001 Stockholm Water Symposium

February 28

- Nomination Deadline for the 2001 Stockholm Industry Water Award

March 22

- 2001 Stockholm Water Prize Laureate Announcement

March – June

- Stockholm Junior Water Prize National Contests

April 15

- 2002 Stockholm Water Prize Nomination Period Begins

May 15

- Nomination Deadline for the 2001 Swedish Baltic Sea Water Award

June 15

- Stockholm Junior Water Prize Projects Due in Stockholm

August 12-18

World Water Week in Stockholm

- Stockholm Water Symposium
- SIWI Seminar for Young Water Professionals
- Stockholm Water Prize Ceremony and Banquet
- Stockholm Junior Water Prize Ceremony
- Founders Seminar
- Stockholm Industry Water Award Presentation
- Swedish Baltic Sea Water Award Presentation
- Global Water Partnership Consultative Group Meeting

September 30

- 2002 Stockholm Water Prize Nomination Period Closes

For regular updates, visit www.siwi.org



Ashley Mulroy visits the SIWI booth at WEFTEC in Anaheim, Calif., USA.



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Notice About Web Publication Orders

Due to a server-related problem, SIWI has not received any publication orders placed through its web site (www.siw.org) between September 1 and November 15, 2000.

If during that time you placed an order for reports, proceedings, or any other information from SIWI, please kindly resubmit your order through the home page, which is functioning properly again.

New Publications from SIWI

Water Security for the 21st Century – Innovative Approaches

Proceedings from the 10th Stockholm Water Symposium



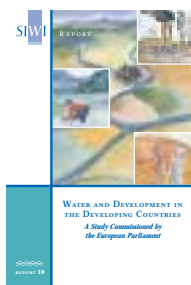
The 10th Stockholm Water Symposium examined how to cope with the creeping but predictable water-related problems due to population growth, urbanization and industrialization. Leading experts discussed how key barriers can

be overcome by increasing water awareness, literacy, solidarity and stewardship in society through innovative educational campaigns in an effort to make water everybody's business. Co-published with the International Water Association.

Water Security for Multi-National Water Systems



"Equitable utilization" between upstream and downstream users in international river basins was discussed during the SIWI Seminar in August 2000. The proceedings from the seminar contains presentations addressing foreseeable changes in water demands, water resources development, and land use conversions driven by population growth, urbanization, industrialization, income generation needs, and other factors.



Water and Development in Developing Countries
Commission by the European Parliament and prepared by SIWI, this study provides recommendations and proposals for the Parliament's decision-making process regarding sustainable development activities throughout the world.

Water Security for the 21st Century – Roles, Responsibilities and Opportunities for Industry

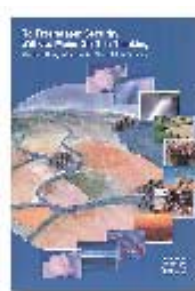
Proceedings from the 2000 Founders Seminar

The 2000 Founders Seminar focused on how different branches of industry can con-



tribute to avoid undermining and create sustainability in water. Presentations are included from the 2000 Stockholm Water Prize Laureate, Professor Kader Asmal of South Africa, and executives from Birka Energi AB, Svenska Cellulosa AB, Unilever, ITT Industries, and the World Business Council for Sustainable Development.

No Freshwater Security Without Major Shift in Thinking



Ten-Year Message from the Stockholm Water Symposia

This special publication summarizes the main factors that have led to the current world water crisis. It also provides strategic actions for coping with the creeping but predictable water-related problems that come with population growth, urbanization and industrialization.

Also available for free as a PDF download from www.siw.org.

Our Struggle for Water

Ten Years with the Stockholm Water Prize and the Stockholm Water Symposium



This hardbound jubilee publication celebrates more than just ten years with the Stockholm Water Prize and Stockholm Water Symposium. It also includes chapters on each Prize Laureate, an overview of current world water problems, and the role of Stockholm and SIWI in the international water arena.

Each publication costs USD 25.

For more information, or to place an order, contact SIWI at +46 8 522 139 60, fax +46 522 139 61, or e-mail siwi@siwi.org. Visit www.siw.org to see all of the resources available from SIWI.