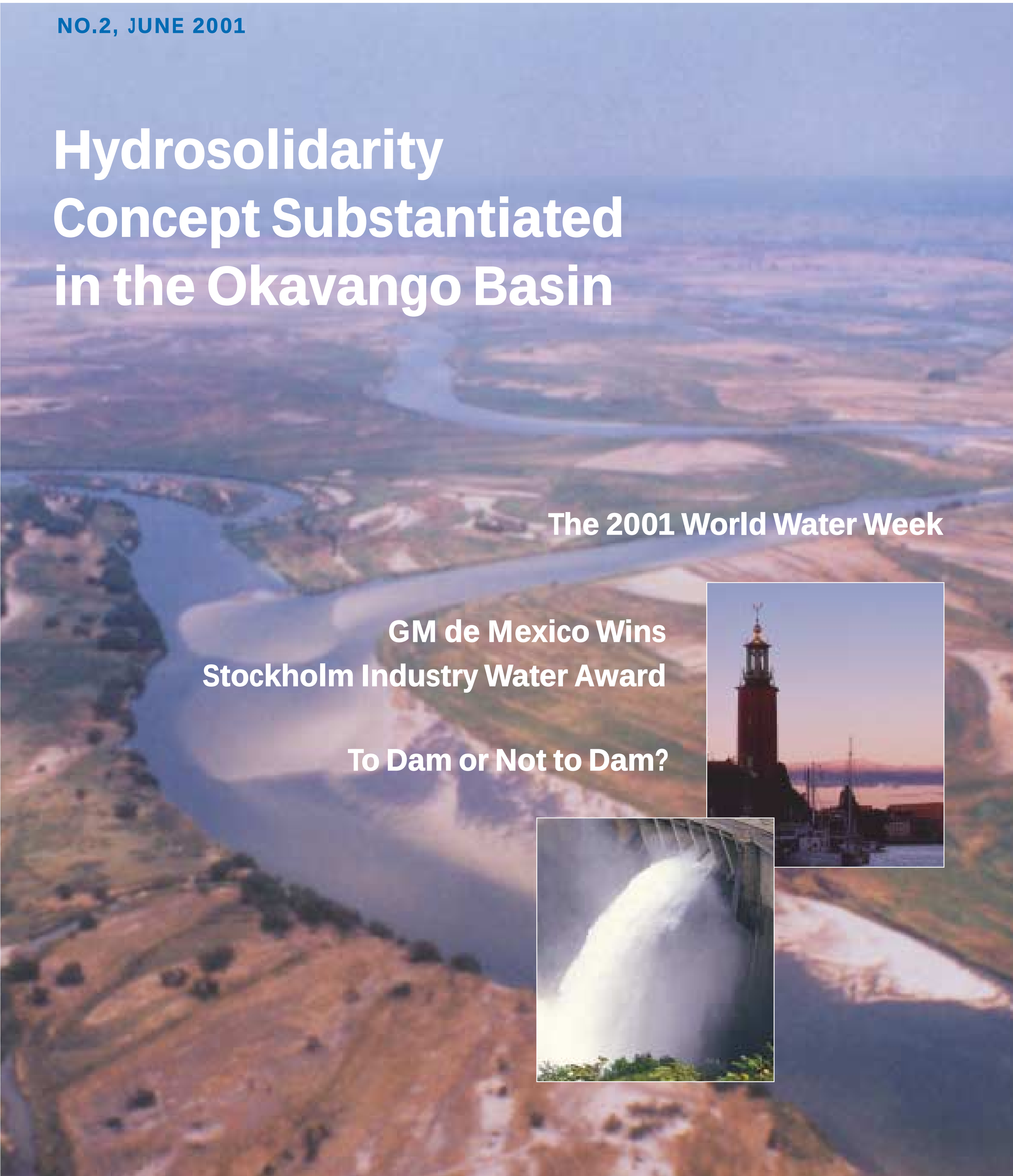
STOCKHOLM WATER FRONT

A FORUM FOR GLOBAL WATER ISSUES

NO.2, JUNE 2001



Hydrosolidarity Concept Substantiated in the Okavango Basin

The 2001 World Water Week

GM de Mexico Wins Stockholm Industry Water Award

To Dam or Not to Dam?

Bridges to Hydrosolidarity Go Through the World Water Week

The Consortium for Dialogue on Water, Food and Environment, involving eight leading international groups such as the World Conservation Union and the World Water Council, and the Water Associations Worldwide, comprised of 10 professional water societies such as the Australian Water Association and the European Water Association, are coming to Stockholm in August.
They won't be alone.

From August 12 to 18, Stockholm will serve as the meeting point for approximately 1,000 leading water experts who will gather for the 2001 Stockholm Water Symposium and World Water Week in Stockholm. In total, some 28 major national and international organizations, together representing hundreds of thousands of people and all regions of the world, are involved, united in the attempt to clarify what drives people's behavior and expectations, resource demands and the resulting resource problems. The new millennium has brought with it a rapid global population growth and industrialization that places tremendous pressure on water for ecosystems, food availability and people. As an ideal venue where professionals from different disciplines can discuss the intersection of these issues, top experts realize more and more the value of attending the Symposium.

The Stockholm Water Symposium has worked very carefully through the years to serve as an integrative platform for interdisciplinary water questions. The issues that are being addressed are often those that have "fallen between the cracks" until Stockholm provided the frame where the issues could be discussed holistically.

1997: a watershed year

The World Water Week in Stockholm truly began developing as such in 1997, when the Global Water Partnership (GWP) chose to host its annual meeting in conjunction with the Stockholm Water Symposium, which many of its members were also attending.

GWP is one of the eight members of the new Consortium for Dialogue on Water, Food and Environment. This high-powered grouping of the primary international actors in the fields of water resources management, water resources research, and environmental conservation and health, have joined forces to initiate a dialogue to examine the question of future water needs for nature and food production in developing countries. HRH Prince Willem Alexander of the Netherlands will be making the dialogue's public presentation in Stockholm.

They will be building bridges among themselves and with other World Water Week participants such as the professional technical societies belonging to the Water Associations Worldwide, which is sponsoring a seminar on "Water Resource Development and Management."

"Fundamental questions have to be addressed to reach a proper management of vulnerable water resources," stresses Professor Malin Falkenmark, chair of the Symposium Scientific Program Commitee. "Water management must become proactive rather than crisis-driven, and building bridges through dialogue between different parties is where it must begin." ■

Dams – a Bridge Through Troubled Water

Bridge building can be difficult with regard to topics as intensively discussed in the past as the construction of dams, an issue with both strong proponents and opponents. Conflicts often appear to be too deep and too complex to be solved.

A workshop on this topic during the 2001 Stockholm Water Symposium will stimulate this conscience building process and elucidate the interdependencies of the stakeholders concerned.

"Dams, Environment and Regional Development" on Tuesday, August 14, and Wednesday, August 15, is co-convened by the International Water Resources Association and the Third World Centre for Water Management. A representative of the World Commission on Dams will also be on hand to provide an update on reaction to its major report, which was released in November 2000.

In addition, Mr. Jay Narayan of Sakets Projects Limited in India will participate in the opening Symposium session on August 13. His presentation is titled "Dams, Environment and Regional Development – Harnessing the 'Elixir of Life: Water' for Overall Development."

Defenders of large dam projects point out their necessity for a long-term economic development, especially in semi-arid areas with large seasonal and interannual fluctuations in rainfall.

In these countries, a dam mainly serves as a water reservoir but often also generates electricity. Critical views focus on the often-profound social and environmental consequences accompanied by the inundation of large areas. Whole villages need to be resettled, cultural heritage and religious sites are flooded and the ecological consequences range from hindering the fish migration to threatening the floodplains downstream which often serve as food resource for people and wildlife.

Bridge building requires willingness by stakeholders to compromise and integrate new arguments into their own concept. When dam defenders flag for the benefit of creating energy without reducing the fossil fuels and contributing to the greenhouse effect, dam skeptics argue. Take the example of the Yangtze dam in China which due to its size and diminished runoff has shown to alter the local climate. Only open discussions and honest interest in an integrative, creative solution can lead to a win-win option for all parties. ■

Globalization and Water to be Examined by Young Professionals

From Seattle to Prague to Rio de Janeiro, globalization is a topic that stirs passions, especially when it is discussed in relation to hot topic issues like development and the environment.

In Stockholm, young people will have a forum to discuss globalization specifically as it relates to water during the 2001 Young Water Professionals Seminar, which takes place Sunday, August 12, during the World Water Week.

What are the key issues linked to the globalization debate that are relevant to the water issues and professionals? What bridges can be built between different actors in society so that globalization can be used as a tool for water security, poverty reduction and sustainable development?

During "The Possibilities and Threats of Globalization," which is free of charge for young professionals from all aspects of society under the age of 35, international experts in water and related fields from Japan, India, Sweden, the Netherlands, Switzerland and the World Bank will look at how the up-and-coming generation can meet the new and more complex challenges of the future.

For full program details, visit www.siwi.org. ■

Hydrosolidarity in Reality: SIWI Seminar Focuses on Practices

In recent years, the SIWI Seminar has helped to develop the concept of hydrosolidarity, where water is shared equitably both upstream and downstream in a river basin. The 2001 Seminar, "Water Security for Cities, Food and Environment – Towards Catchment Hydrosolidarity" picks up the theme further by exploring how hydrosolidarity – now an accepted concept in most circles – can be explored in a realistic way.

Last year, the seminar pointed out that water, contrary to some common perceptions, could be a catalyst for peace rather than for violent conflict. "The question now is how to solve these conflicts of interest within a river basin in a realistic way," says Director Ulf Ehlin of SIWI. To do so, the seminar will look at trade-offs and compromise building between competing water interests, such as agricultural production versus aquatic ecosystems, water for urban masses verses water for industrial development, and water for urban dwellers versus their rural counterparts.

Case studies and success stories from a number of river basins such as the Volga River basin in Russia, the Rio Grande basin in the USA and Mexico, the Huai basin in China, and the Curu River basin in Brazil, will be analyzed. The question in focus: what would characterize a realistic system for a harmonized approach, able to reconcile upstream and downstream water-related interests, compatible as well as non-compatible ones, and blue-green water aspects.

Because there are definite differences in approaches to achieving hydrosolidarity in humid and in dry climates, the seminar will take efforts to examine the problematique and potential realities in more arid regions. These regions already face the most water stress, urban growth and (often) unregulated industrialization. Thus, they also have the highest potential for conflict. ■

Program
Saturday, August 18, 09:00 - 17:00

Introduction
- Welcome, Manuel Dengo, DESA/UN, and Ulf Ehlin, SIWI
- Towards Hydrosolidarity: Moving from Resource Capture to Cooperation and Alliances, Anthony Turton, University of Pretoria, South Africa
- Transboundary Water Management as an International Public Good, Frank van der Steenbergen, Netherlands

Session 1. Trade Offs and Compromise Building Between Competing Water Interests
- Urban Water Security/Rural Development, Jan Lundqvist, Linköping University, Sweden
- Urban Water Security/Industrial Development, Al Fry, WBCSD
- Agriculture/Aquatic Ecosystems, Malin Falkenmark, SIWI

Session 2. Realigning Urban Security and Economic Development in a Catchment Perspective
- Volga River Basin, Alexandr Kosarikov, Russian Parliament, Russia
- Subarnarekha Basin, Ramesh Bhatia, IIMI, Resources & Env. Group, India
- Rio Grande, I Aguilar-Barajas, Center of Strategic Studies, Mexico

Session 3. Compromise Building Between Urban and Rural Development in Dry Climate Catchments
- Curu River Catchment, Gertjan Beekman, SHIS, Brazil
- Huai River, RUI-JU Liang, Hohai University, China
- Segura River Basin, R. Llamas, Spain
- Beotic Kifissos River Basin, Dionissios Xenos, EYDAP Water Supply & Sewerage Corporation of Athens, Greece

Session 4. Towards Hydrosolidarity – General Discussion

Media Plays Key Role in Building Water Literacy

The price of oil goes up, or a jumbo jet crashes, and headlines are made. Justifiably so.

But when millions of people in developing countries pay more on average for water than their counterparts in developed countries, or when thousands of people die every day from easily preventable water-related diseases, few people know.

In short, a water blindness exists among politicians, decision makers and the general public, in large measure because water scientists, practitioners and managers have failed to communicate to mass media – the gatekeepers to the world – about the critical nature of water issues and the escalating water crisis.

A Symposium workshop as well as the active participation of several noted journalists in other Symposium activities, will examine how water professionals can through better dialogue with the media help to improve public perceptions of water and water issues.

"How to Increase the Status of Water Issues in Governance and Public Perception," a Symposium workshop taking place on Wednesday, August 15, is co-convened by the World Water Council and will feature presentations from both journalists and water practitioners.

Mr. Steven S. Ross from the distinguished Columbia School of Journalism and Ms. Erika Bjerström, one of Sweden's most prominent journalists, will begin the workshop as invited speakers, followed by presentations from Sweden, Germany, France, Kenya, Mexico, India, Greece and China.

They will examine why, for example, water has a low status on the international agenda, particularly the international political agenda, and why there is a fundamental misunderstanding of the water cycle.

Two other prominent journalists participating during the week include Mr. Olle Wästberg, the current Consul General of Sweden in New York, and Mr. Nik Gowing, a correspondent for the BBC.

Mr. Wästberg will address the opening session on Monday, August 13, with a presentation entitled "Evangelizing in the Media Age: American and Swedish Perspectives on How to Spread Your Message." Mr. Wästberg was previously chief editor for *Expressen*, one of Sweden's largest daily papers.

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Industry Becomes Actively Involved

Officially, "Building Bridges Through Dialogue" is the theme of this year's Stockholm Water Symposium, but the theme also applies to any number of World Water Week in Stockholm activities and actors, including business and industry.

In recent years, business and industry stakeholders – including an increasing number of participants in the Stockholm events – have demonstrated an increasing commitment in water questions. Often portrayed as major water polluters, a dialogue with industry needs to integrate and overcome long-established frontiers between scientific results and concrete applications.

Corporate decision makers often find it difficult to understand and interpret the latest scientific results – a niche which today has partly been recognized and met through the employment of so-called information brokers, who serve as a mediator between research and management while being placed in a company. Scientists, on the other hand, are often in full knowledge and consciousness of critical facts and the threatening implications of environmental pollution, but often incapable to clearly communicate these facts.

Willem Alexander of the Netherlands, Prince of Orange-Nassau

A number of activities during the week will include extensive involvement of industry representatives, including a facilitated stakeholder dialogue moderated by Mr. Nik Gowing of the British Broadcasting Corporation. The workshop, entitled "Relation Between Industry and Other Water Interests in a Catchment Context," takes place Tuesday, August 14.

On Wednesday, the Founders Seminar will gather top business leaders to discuss "Business and Industry – a Driving or Braking Force on the Road Towards Water Security?" Wednesday also features the presentation of the 2001 Stockholm Industry Water Award to GM de Mexico (see page 10).

Key speakers promote the subject

The Symposium's opening and closing sessions will also feature the perspectives of several experts with keen insight on water-related issues for industries and politics, including HRH Prince Willem Alexander of the Netherlands; Mr. Dennis Minano, vice president, General Motors; Mr. Anil Agarwal, Centre for Science and Environment (India); Mr. Göran Lindahl, undersecretary, United Nations; and Mr. H.E. Valdas Adamkus, president of the Republic of Lithuania.

Constructive bridge building must include both a willingness and an acknowledgement between actors. Hydrosolidarity has to inevitably be connected to the growing conscience of mutual interdependence under limited water resources. The 2001 Stockholm Industry Water Award winner is a good example that environmental and economics are win-win-options that benefit water. With a successful dialogue, the first essential step for mutual understanding and respect, the only basis for future water management, has been taken. ■

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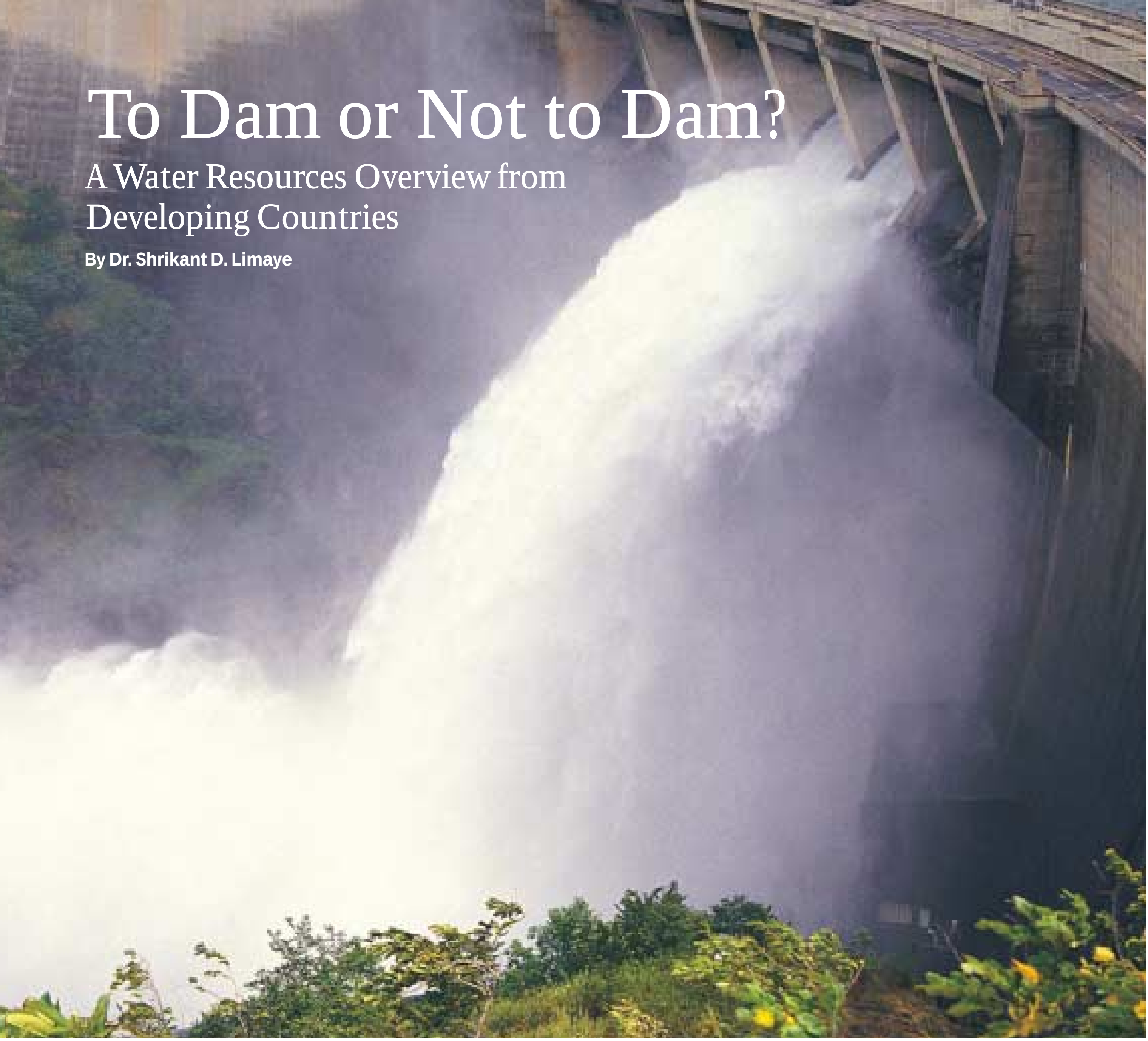
Mr. Gowing has in recent years reported regularly for the BBC from the globalization-driving World Economic Forum meeting in Davos, Switzerland. Mr. Gowing will also facilitate the panel discussion in Workshop 1, "Relation Between Industry and Other Water Interests in a Catchment Context."

Another good example of the growing water awareness among journalists is the "Workshop on Environmental Journalism" being convened by SIWI and Sida during the World Water Week. Designated environmental journalists from the Baltic Sea region and the Lake Victoria region are invited to gain insights in relevant journalistic tools and methods while attending selected workshops and presentations to consolidate their knowledge. ■



To Dam or Not to Dam?

A Water Resources Overview from Developing Countries

By Dr. Shrikant D. Limaye

The *Report of the World Commission on Dams* (WCD), released last November, is a comprehensive and lucid document, with far reaching consequences on the future of existing and proposed large dams. A dam with a height of 15 meters or more from the foundation is classified as a large dam; dams between 5 and 15 meters but having a reservoir volume of 3 million cubic meters or more, are also large dams. There are about 45,000 such large dams in the world, with the majority of them (67%) located in developing countries, including China (45%) and India (9%). WCD's major finding is that the technical, financial, economic, socio-cultural and environmental performances of most of the large dams have a considerable scope for improvement. In some cases the dams have caused more harm than good.

In many developing countries, environmentalists are happy that the WCD has vindicated their stand by putting blame on existing large dams. On the other side, the lobby of promoters of large dams is preparing to counter the findings of the report. However, one of the main report's purposes is to facilitate discussion between the concerned parties and to orient them towards corrective actions. Although this article focuses on the Indian scenario, the points are also applicable to other developing countries.

The Indian experience

In India, where the annual rainfall is available mostly during a three-month monsoon season, and the rest of the year is dry, large dams do play an important role. However, there is no denying that the mismanagement of the existing large dams has resulted in wastage of water, waterlogging of low lands, inequitable distribution of benefits, and a grave injustice towards dam-affected people.

In principle, the planning and construction of any "Large Dam Project" for irrigation and water supply, should ensure that eight essential activities are coordinated (see box).

Lack of coordination in these activities by various executive agencies has adversely affected the benefit-cost (B-C) ratio of large dams, thereby giving rise to the following suspicions: (1) under political, non-technical pressure, the engineers and planners inflate the B-C ratio at the design stage, to get the project approved. The designed B-C ratio is, therefore, never achieved afterwards; (2) ideal sites for large dams have already been used up. Now only the second class or third class sites are being promoted, again under political pressure.

Productivity remains stagnant

In India, success has not been achieved in controlling soil salinization, waterlogging, and reservoir silting and inordinate delays in rehabilitation of dam-affected people. The productivity per cubic meter of stored water has not appreciably increased for the dams constructed in 1990s than their 1950s-era counterparts. Those in favor of large dams are now waiting for the operational results of three major projects, famous all over the world for meticulous planning: the Three Gorges Dam Project in China, the GAP – South East Anatolia Project in Turkey and the Narmada Project in India.

At present, the environmentalists may feel that the WCD report has upheld their stand. However, the bottom line for India is that large dams, medium dams and small dams are needed, with coordination of the eight activities and with due care for rehabilitation and protection of the interests of the displaced people.

Also, watershed development programs need mini-dams, micro-dams, percolation tanks, underground dams, wetlands, farm bunds and even farm ponds at suitable places, for better management of water resources. Many other developing countries also have to follow the above policy in order to provide food for the growing population and drinking water to the ever-expanding urban centers.

Rapid urbanization is demanding urgent attention in water resources management. In another 20 to 25 years, about 60% of the population in the low-income countries will be in urban and peri-urban areas. About 50% to 60% of this population would be the urban poor, living in slums or hutments without access to city water supply and drainage network. Providing safe drinking water supply to this ever-growing urban and peri-urban population and treating the wastewater created in the cities is going to be a very big challenge to the civic authorities, city planners, politicians, policy makers, social workers and environmentalists. The problem is same for all major cities in developing countries: Buenos Aires, Sao Paulo, Mexico City, Cairo, Johannesburg, Mumbai, Karachi, Colombo, Dhaka, Bangkok, Jakarta, Manila, and others.

The City of Poona (population about 2.2 million) near Mumbai in India gets about 650 million liters per day (mld) of water from the reservoir of a dam about 12 kilometers away. From this supply, about 520 mld of wastewater is generated. This wastewater is supposed to be treated by the sewage treatment plants before letting it into the river, so as to ensure good aquatic environment in the river. However, at present only 10% of the wastewater is treated and the state of the river is like an open sewer. In order to improve this situation the civic authorities must spend large sums on wastewater treatment plants and the citizens must pay increased water bills. Similar is the situation in many other cities in India and other developing countries. Unfortunately, the elected representatives in the civic authorities are often not educationally qualified to understand and appreciate the gravity of this situation, let alone plan to deal with it.

Pollution of surface water flowing in streams and rivers is thus a serious problem. However, the pollution of groundwater resources is even more serious. Average time required for the water in a polluted river for reaching the sea is about 16 days, if the river flow is not arrested by a dam. If a groundwater aquifer gets polluted, the average residence time of groundwater in an aquifer is about 1,400 years. Pollution of surface water and groundwater contributes to the progressive deterioration of the urban environment. Still, the major urban centers in developing countries, through their financial strength and political influence, have a possibility to find investment partners for solving their water-related problems. The worst situation is in mid-sized towns, which have all the pollution but no financial or political clout.

Dam debate to continue

The debate about 'dams or no dams' will continue for quite some time in future. In the meanwhile, the tenets of water management policy in developing countries should include: economical and efficient use of the water in the reservoirs of existing dams, controlling the silting of reservoirs through watershed development, demand management, recycling and reuse of wastewater, prevention of pollution of surface water and groundwater, irrigation of food crops giving more calories per cubic meter of water, use of aquifers having marginal quality of groundwater, creating a public awareness about the true economic value of water, and of course building the bridges of understanding and cooperative action between the various stakeholders.

Dr. Shrikant D. Limaye is Vice President (Asia) of the International Association of Hydrogeologists (IAH), President of the Association of Geoscientists for International Development (AGID), and Director of the Ground Water Institute (GWI) in Poona, India. He may be reached at limaye@vsnl.com.

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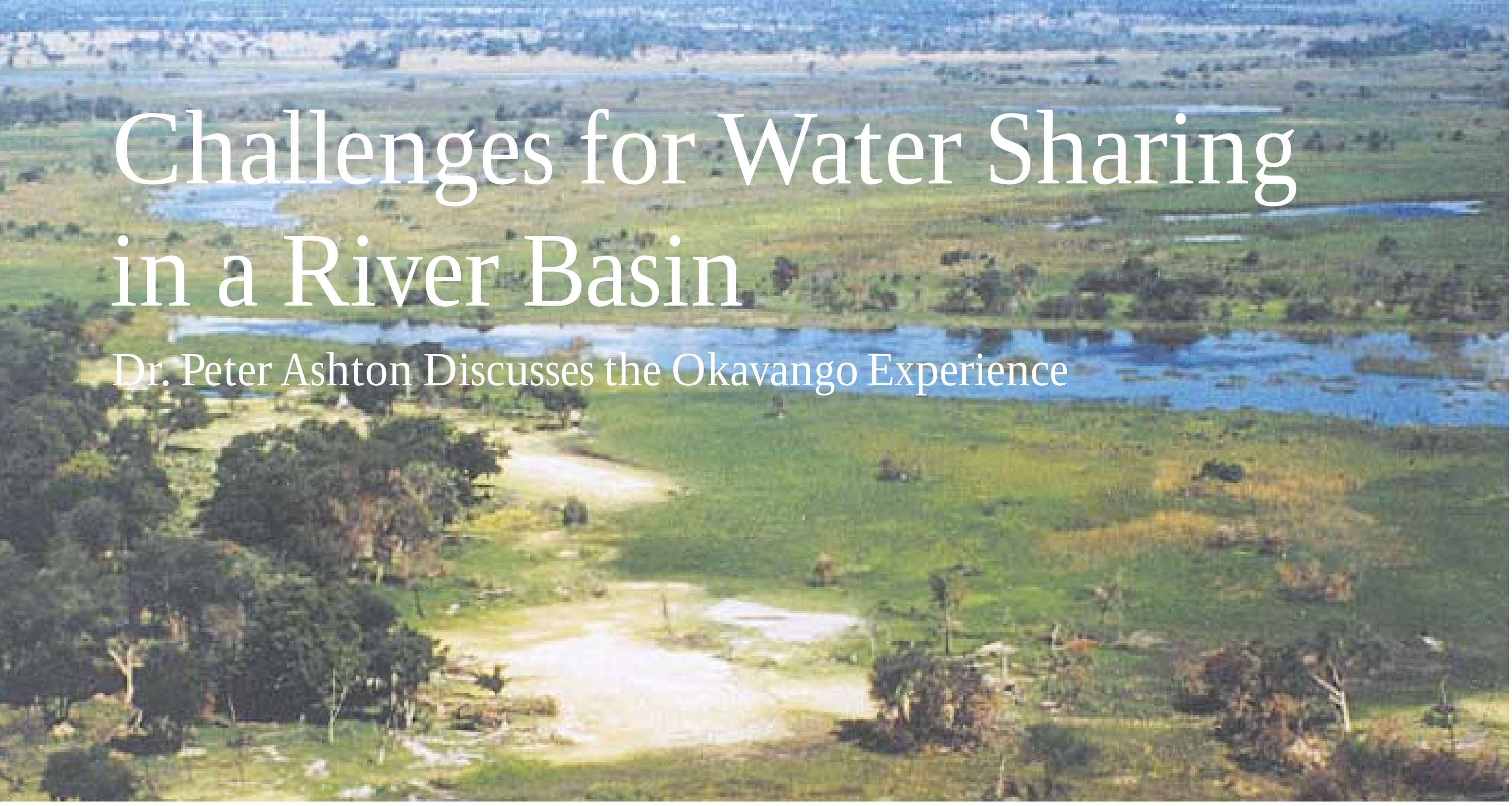
8 Essential Items for Large Dam Construction

- Construction of dams
- Construction of canals
- Construction of field channels and command area development
- Watershed development for controlling silt load in the runoff water coming into the reservoir and proper land use planning in the watershed area.
- Rehabilitation of the displaced people from submerged villages
- Training of farmers in the command area in economic use of water, and in shifting from traditional cropping pattern of dry-land farming to irrigated farming, promoting conjunctive use of surface water and ground water, and development of seasonal lift irrigation schemes for 'out-of-command' area
- Infrastructure development like roads, electricity etc., in command area, for easy marketing of agricultural produce
- Establishment of water users groups and promoting women's participation in water management

Challenges for Water Sharing in a River Basin

Dr. Peter Ashton Discusses the Okavango Experience



Aerial view over a portion of the lower Boro River in a dry season. The entire area (except the islands) will be under water when the floods arrive in mid-June.

During the 2000 SIWI Seminar "Towards Upsteam/Downstream Hydrosolidarity," the importance of communication between countries sharing the same river basin was highlighted. A whole river basin approach that focuses on upstream/downstream conflicts of interest must involve attention not only to water itself but also to water-related ecosystem services. Dr. Peter Ashton from South Africa has examined this aspect with respect to the Okavango River Basin, which is shared by Angola (upstream), Namibia and Botswana (downstream). In a paper presented at the UN University Symposium on Southern African Waters in September 2000, he presented a concrete example on estimates of water needs in the basin states, plus management implications and recommendations. He stresses the importance of an ideally functioning River Basin Organization with representatives from all countries in the basin. With hydrosolidarity issues again to be in focus at the August Stockholm Water Symposium, *Stockholm Water Front* took time to talk to Dr. Ashton about the subject.

Dr. Ashton, you name challenges and tasks of the ideal River Basin Organization (RBO). What in your opinion are the main points why those existing today do not work efficiently?

Perhaps the two most important reasons why most River Basin Organizations do not work perfectly are due to the make-up or constitution of the organization, and the ways in which they operate.

In a shared river basin situation such as that of the Okavango or Zambezi rivers, it is vitally important to make sure that all national-level role players (i.e. national governments of each basin state involved) feel that they have an equitable share in all decision-making processes. If any "player" feels that their interests are being overwhelmed or ignored by one of the other parties, then there is a tendency to withdraw from the process; the process then loses legitimacy in the eyes of at least some of the parties. This is quite easily visible in the case of the Zambezi River. The Zambezi River Authority consists of representatives from two countries, Zambia and Zimbabwe, whilst there are actually eight basin states who share portions of the catchment. The interests of the other six parties appear to be seldom taken into account, except for occasions when a formal request is made. In this type of situation, various claims are made by external role players (normally representatives of NGOs and not government officials) that the two key parties dominate discussions and decision-making processes. There seems to be a general absence of equity and ownership in the process. Overall, this contributes to less-than-ideal management of the catchment's water resources.

A similar situation, though with somewhat different circumstances, also holds for the Okavango River basin. The existing institutional arrangement, OKACOM, involves all three basin states. However, with a civil war continuing within its borders, the Angolan government has many things on its mind; water may not be top of the list of priorities since Angola is a relatively well-watered country. In Botswana and Namibia, however, water supply is a crucial issue and is very close to the top of the agenda. In this case, the institutional structure is driven by government representatives and, like good government representatives everywhere, they work well at their international relations with their neighbors and at supporting their respective government viewpoints. However, if everyone does not have exactly the same set of agenda points and in the same priority order, it becomes difficult to generate and maintain cohesive, integrated programs of action.

What would be the "ideal" River Basin Organization?

An ideal RBO would have representatives appointed by each basin state, but these would not be government representatives. They might in fact be private sector individuals who are empowered and resourced by their home government to act on their behalf and to focus on the key issues related to water management. This RBO would also be responsible and accountable for achieving a series of clearly defined objectives. Some would relate to basin-wide management of water resources, resource protection, and water supply to user groups on the basis of defined needs and proven ability to conserve (not waste) water, pollution control, etc.

How could your concept be transferred into the region, and what are the major problems?

It is extremely important for the basin states involved to be in a position where each of them fully trusts the motives and promises of their partners. In addition, each party trusts its partners to deliver on their promises in terms of support for their representatives on the RBO. Many southern African democracies are relatively young and still seem to feel vulnerable about their sovereignty. Trust is sometimes difficult to give if you are not always on the very best of terms with your neighbors.

Similarly, if the relative social, economic and military strengths of such neighbors are very different from one another, there is sometimes a tendency to worry that a stronger neighbor may become big brother and impress "his" views over the others. This can only be avoided when neighbors trust each other. Ideally, I think it would be important to start with a test case basin that can serve as an example to everyone in the region. This would, unfortunately take time to achieve; and the sub-continent does not have a lot of time to spare when one examines the pressing needs for water and the pervasive effects of HIV/AIDS. In summary, building trust between neighbors and creating/maintaining competence are probably the two biggest problem areas here.

In your calculations on future water balance in the Delta, a 3% loss in water (to ecological services, among others) does not sound very threatening for the ordinary reader when having a variation of the mean annual flow of 4-10% in mind. Why do you think it is actually a danger? How would you try to reach the public with that ?

Three percent (3%) isn't a large fraction when you look at the number on its own. Also, if you consider that many southern African rivers already have well over 50% of their water allocated already, and some as high as 100%, then 3% doesn't seem a lot. But it is also important to remember that this figure represents a proportion of annual average flow. In dry years, the volume would be much more than 3%, and in wet years it would be much less. My estimate is that in the worst case dry season, the number may increase to 10% of that specific seasonal low flow; similarly, in the highest flood season, it would decrease to below 1% of that season's flow. However, even at these high and low extremes, the proportions are still relatively low because the Okavango River is a large river.

To my mind, the major threat that is perceived by residents along the river and around the Delta are based on perceptions that the Delta would dry up, if not entirely then large areas of it, if water is withdrawn from the Okavango River upstream. This would then destroy its ecological integrity and interrupt the supply of ecosystem goods and services that these people rely on for their everyday lives. One of the major problems, and one that fuels these perceptions, are the statements made by experts or knowledgeable people that the Okavango Delta is a very fragile ecosystem that is delicately balanced and is very susceptible to disturbance. They are, in essence, correct. My problem is that the Delta ecosystem has evolved in the presence of large-scale changes in flows that have occurred naturally and without any help from man. It is this very variability in flows that drives the mosiac of habitats within the Delta ecosystem and gives it its unique character.

I think it is important to make sure that people understand how the Delta functions and what environmental processes control the ways in which it shrinks and expands in response to natural cycles. Secondly, it is also very important to inform people that if populations continue to grow unchecked, then there will be an inevitable increase in the numbers of people per unit of available water (Professor Malin Falkenmark's "water crowding" index shows this exceptionally clearly). At this point, people have to make choices and not all of the choices are easy. If we want to completely conserve an ecosystem (such as the Okavango Delta) then we have to understand very clearly what the real costs are to society. It is simply not fair or equitable to expect one country to bear all the costs whilst other countries enjoy at least some of the advantages.

In the case of a river shared by more than one basin state, there must be absolute consensus between all the parties as to exactly what is best for the basin, not just for one country. Then, decisions have to be taken and acted upon. Then, each party has to take accountability for the joint decision.

In what way, do you think, the new approach of the blue/green water concept affects your calculations and perspectives?

The "blue water/green water" approach helps to clarify where the water in a river or lake comes from. It also helps to demonstrate where water is needed and how much is needed and why it is needed. To some classical hydrologists, it complicates what would otherwise be a few relatively straightforward calculations about how much water is needed for what purpose. I believe that the concept helps people to form a better opinion/judgement as to what proportion of the flow in a system can safely be used/allocated for purposes other than maintaining river flows/aquatic ecosystem functioning. It also helps when trying to understand seasonal changes in flows in arid regions such as southern Africa. Overall, I am comfortable with the concept and the fundamentally sound principles embodied therein. In particular, it helps to prevent over-estimation of the fraction of a catchment's water that could be abstracted for off-channel use.

Dr. Peter J. Ashton is a Water Resources and Water Quality Specialist at CSIR - Environmentek in Pretoria, South Africa. He can be reached at pashton@csir.co.za.

Aerial view of a small portion of the floodplain in the Okavango Delta along the middle reaches of the Santantadibe River channel.

GM Mexican Auto Plant Wins Stockholm Industry Water Award

All the facilities in GM Mexico have wastewater treatment and recycling technology as part of an intensive water conservation program.

Proving that more products can be manufactured with less water, and that corporate environmental sustainability can go hand-in-hand with the financial bottom line, the General Motors de Mexico Ramos Arizpe Complex was announced in May as the 2001 recipient of the prestigious Stockholm Industry Water Award. It will be presented on August 15 during the annual World Water Week in Stockholm.

The award, which is given by the Stockholm Water Foundation, the Royal Swedish Academy of Engineering Sciences and the World Business Council for Sustainable Development, recognizes innovative corporate development of water and wastewater process technologies as well as contributions to environmental improvement through improved performance in production processes and new products.

The treatment wastewater storage lagoon at Ramos Arizpe Complex is the habitat of several fish and birds species, a clear demonstration of water quality after the production processes.

The Ramos Arizpe Complex, an automotive production facility located in an area of extreme water scarcity 85 km west of Monterrey, was cited by a committee of international experts as an outstanding example of corporate sustainable water use for its "extensive use of water and wastewater treatment and recycling techniques that convert saline into potable water and conserve a scarce resource."

"We are extremely impressed by the wide range of coupled solutions that GM has adopted," said Mr. Björn Rosén, chairman of the nominating committee. The facility, he said, enhanced production while at the same time reduced water consumption through reuse of both industrial and sanitary wastewater within production processes. Together with a commitment to continuous improvement, GM's Ramos Arizpe Complex demonstrates good competence by utilizing appropriate technology for differing circumstances. By manufacturing more products with less water, it also demonstrates the win-win opportunity to reduce costs while simultaneously improving the environment – a reflection that successful technical and economic results can be combined with a strong social commitment.

Local water scarcity and corporate responsibility drive innovations

The complex opened in 1980 in Ramos Arizpe (pop. 40,000), an area where the only source of water was a small, semi-confined aquifer with a relatively high salt content (0.2%). The company's challenge was to secure water for production without depleting the aquifer (which is also the local drinking water source), desalinate the well water supply, and establish a recycling and reuse process for the industrial and sanitary wastewater – all within the framework of an intensive water conservation program.

To help reduce its consumption from the aquifer, the facility employed a variety of physical, chemical and biological wastewater treatment processes to recover and reuse 70% of its industrial wastewater. The selective use of different processes – whether advanced (micro-filtration), simple (solar evaporation ponds), or high tech (membrane filtration) – enabled the facility to effectively tailor its water conservation and recovery program as needed, and to make it as efficient and cost-effective as possible.

To convert brine to solid salts and thus facilitate their removal, a recovery system involving micro-filtration, reverse osmosis and solar evaporation ponds was used. This promoted efficient use of well water by increasing the useable amount withdrawn from 67% to 94%.

Through such efforts, GM de Mexico has reduced annual well water withdrawal from 1,470,000 m^3/year in 1986 to 700,000 m^3 in 2000. At the same time, the complex has increased annual production seven-fold while reducing the average amount of well water needed to produce a vehicle from 32 m^3 to 2.2 m^3.

The integrative solutions have been a success for both the region and the production complex, which employs nearly 6,000 local residents and now produces annually some 590,000 engines and 222,000 passenger vehicles.

"When the Ramos Arizpe Complex expanded its operations, one of the major challenges we faced was the scarcity of water," said Mr. Hank Hale, director of manufacturing for GM de Mexico, which is headquartered in Mexico City and also operates production facilities in Silao and Toluca. "We had to keep looking for innovative solutions to solve this problem of the region. Now we even have a treatment wastewater storage lagoon with fish and birds as a testimony of our social responsibility to develop sustainable business."

"As one of the world's largest industrial companies, General Motors has understood for many years that we must do more than simply provide the products and services that consumers want to buy," says Mr. Dennis Minano, GM vice president, and chief environmental officer. "We are proud of the people working at our Ramos Arizpe Complex and the work they have done to achieve better quality water for both the plant and community, and thank the Stockholm Water Foundation, Royal Swedish Academy of Engineering Sciences and the World Business Council for Sustainable Development for honoring their efforts." ■

A Life's Journey Culminates in Stockholm

Professor Takashi Asano to Receive 11th Stockholm Water Prize in August

When Professor Takashi Asano ascends the hallowed marble steps inside the Stockholm City Hall on August 16, he will receive the 2001 Stockholm Water Prize from the hands of HM King Carl XVI Gustaf of Sweden.

In a grand way, the moment will honor Professor Asano and his life's journey. It is a journey that has taken him from his birthplace, the beautiful city of Sapporo on Japan's northernmost island of Hokkaido, through the era-defining moments of the 1960s, and onward to many noteworthy professional accomplishments in both government and academic service.

It is for his role as the world's most renowned expert in the domain of wastewater reclamation, recycling and reuse, that he'll receive this year's Stockholm Water Prize. (For more on water reuse and Professor Asano's professional accomplishments, see the April 2001 *Stockholm Water Front* or visit www.siwi.org.)

Professor Takashi Asano through the years: as a seven-year-old entering elementary school in 1944 in the school uniform sewn by his mother, graduating with a bachelor's degree from Hokkaido University in 1959, and explaining a pilot study to visitors while serving as an assistant professor at Montana State University in 1971.

Post-war boom leads to California dreaming

Following World War II, industrial development was well under way in Sapporo and Hokkaido in food processing, forestry and other areas by the time a young Takashi Asano entered Hokkaido University to study agricultural chemistry. Upon graduation, he left Sapporo to work in Osaka and Tokyo in the petroleum industry, which was at the forefront of research and development in petrochemicals.

Since post-war industrialization came quickly to Japan, it was intense, as were the effects on the environment. "Pollution was everywhere in Japan in those days," says Professor Asano. His employer, wanting Asano to learn more about air and water pollution science and engineering, sent him to the University of California at Berkeley in 1963 to study environmental engineering. Little did he know that this academic respite would change his life.

There, he accomplished his academic goal and earned his master's degree; subsequently, he also earned a doctorate from the University of Michigan-Ann Arbor. Along the way, however, he learned much more than anticipated.

"My experience in Berkeley during the 1960s was enormous," he recalls while reflecting on events of the time: the assassination of President Kennedy; the Free Speech Movement at Berkeley; the first demonstrations against the Vietnam War; and the early inhabitation of Haight-Ashbury in San Francisco by the so-called "flower children."

"All of this provided me with an enormous education in American democracy," Asano says. "We were all sort of 'hippies' then on the Berkeley Campus." But this education also provided him with incentive to, at some future point, join government service and try to change things from within. That future would also include his wife, the former Holly Newcomb, whom he met while studying in California.

After pursuing his academic career at Montana State University (where he gained a reputation for trout fishing), Washington State University and the University of California at Davis, that chance came in 1978. After a seven-year period of droughts in the mid-1970s, California Governor Jerry Brown established the Office of Water Recycling (OWR) in the State of California Water Resources Control Board (SWRCB) in Sacramento.

There, Asano became a "Water Reclamation Specialist," which enabled him to conduct practical research on water reuse and to coordinate state-wide efforts at promoting safe and reliable water reuse in the context of water resources management.

"It was a good job and the OWR was unique as a government office," Asano says. "I was able to work with the best minds of the environmental and water resources engineering profession in the USA and abroad

Visiting his alma mater, Hokkaido University in Sapporo, Japan, with his wife, Holly, in 1989.

during the formative years of wastewater reclamation, recycling and reuse." (In recognition of his accomplishments during this period, SWRCB proclaimed Professor Asano's contribution on June 6, 2001 by issuing a Resolution honoring his receipt of the 2001 Stockholm Water Prize.) It also provided a good platform for work that he would then follow-up on upon his return to academic life at the University of California at Davis in 1992. In particular, his research in later years on public health risks was based on the research needs established while at the State of California.

Professional collaboration a key

Professor Takashi Asano is esteemed in his own right, but he is quick to recognize the efforts of those with whom he has worked. In fact, he credits his Stockholm Water Prize honor as a result of the collaborative efforts with colleagues and mentors that he has worked with in the USA, the Mediterranean countries, Africa, the Middle East, South America, Japan and elsewhere.

"One common thing that I learned from visiting these countries was that there were many well-educated and well-trained people in water sciences and engineering, and public health," Asano says "We certainly need to get valuable advice from those knowledgeable people." Working with others in discussing and solving common goals of water pollution prevention, environmental sanitation, water supply reliability, efficient use of water and public health – challenging issues that are essential for civilization – is the aspect of his career that, he admits, has continually brought him the most pleasure.

"It is great that water reuse is now recognized as an important element of water resources management," he says. "We need good research in this area not only in science and engineering but also in economics, sociology and public policy."

No one, he says, will be a winner in an environmental dispute. Thus, when it comes to "bridge building" in every aspect of water reuse, including research, he emphasizes the need for collaboration and communication among scientists, engineers, policy makers, bankers, elected officials, administrators, the press and the public.

It is through involvement in a number of international professional associations that he has also had a tremendous impact. The International Water Association's Water Reuse Specialist Group is such an organization that promotes information and technology transfer through workshops and symposia.

Together with Professor Uwe Neis of the Technical University of Hamburg, Germany, Professor Asano co-founded the group in 1987 and has gone on to help organize international water reuse symposia in Spain, Greece and Italy, and to expand professional interest and growth in the subject throughout the world. The Water Reuse Specialist Group was later expanded by Professor Rafael Mujeriego of the Technical University of Catalonia, Spain.

In his teaching career, he is proud to have advised many talented students through the years, many of whom are now assuming leadership mantles. For example, Professor Asano was the graduate advisor for the President-elect of the Water Environment Federation, Mr. James H. Clark, at the Washington State University.

"Teaching and research bring me a great pleasure," he says.

Time to pause and smell the roses

A long and distinguished career that will culminate August 16 with the Stockholm Water Prize presentation has given Professor Asano plenty to look back on – and forward to.

In addition to supreme excellence in his chosen profession, Professor Asano has throughout his 64 years developed a fondness for trout fishing, skiing, poetry and the guitar. These days, he enjoys spending his free time vacationing every February in Hawaii with his wife, spending time with their dog Tinker, concert-going, writing chapters in his planned water reuse textbook, and traveling.

"Traveling and visiting good friends in different countries and talking about 'sewage' still brings me excitement," he says. That journey will continue during the 2001 World Water Week in Stockholm, where he will be honored in royal fashion as the 11th recipient of the world's top water honor, the Stockholm Water Prize.

With Dr. Takeshi Kubo, the 1994 Stockholm Water Prize Laureate, in Osaka in 1987 at the Japan Sewage Works Association Conference. Dr. Kubo and Professor Asano attended the same Sapporo high school and Hokkaido University, although they were a dozen years apart.

The winners of the Swedish contest, pictured here in May with ITT Flygt President Anders Hallberg, will compete along with 17 other national winners for the international prize.

18 Countries Compete in 5th International SJWP Competition

Next month, some of the brightest young minds in the world will join hundreds of other water leaders in Stockholm during the annual World Water Week.

What distinguishes this group of 50 young men and women is that they are all under the age of 20 and will be competing to win the prestigious Stockholm Junior Water Prize competition.

The competition, in which winners of national water prize contests compete with their projects in Stockholm for the coveted blue crystal sculpture and $5,000 scholarship, enters its fifth year as an international event.

Beginning in 1997 with seven countries, the Stockholm Junior Water Prize has grown consistently. This year, 18 countries will be represented in the final, reflecting a broad spectrum of cultures and disciplines.

Participating countries include Argentina, Australia, Canada, Chile, Denmark, Estonia, Israel, Italy, Lithuania, Mexico, Nigeria, Norway, Poland, South Africa, Spain, Sweden, the United Kingdom, and the United States.

Founded and established in Sweden in 1995 by the Stockholm Water Foundation, the Stockholm Junior Water Prize competition has been sponsored globally by ITT Industries since 1997.

Reflection and anticipation

Dr. Johan Rockström of IHL-Delft in the Netherlands is chairman of the Stockholm Junior Water Prize international nominating committee and has had a good position to see the competition grow and to reflect on its relevance.

"It is fair to state that this Prize has established itself as 'The World Championship' on water research for youth," Dr. Rockström said. "This is a great achievement, but more importantly it is filling an enormous gap. There are simply far too few arenas for tribute of young excellence in managing our finite and precious natural resources, such as water."

In the last five years, the competition has grown not just in size but in quality. Competition has increased, and the science behind the competing projects is today higher and much more even across the countries than it was five years ago – a fact that makes it even tougher to win yet also explains the competition's success.

One of the most rewarding parts, according to nominating committee members (who themselves represent different disciplines and countries) is that working with the Prize provides a good dialogue between current water professionals and young water scientists, both in the home countries and during the Stockholm Water Symposium and World Water Week.

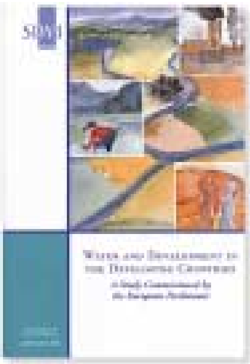
"It is impressive how many new impressions that actually may help your own science can emerge from some small-talk with these young, innovative and generally extremely optimistic and future-oriented competitors," said Rockström. A common scene during the Stockholm Water Symposium is the sight of well-known senior water scientists, enlightened with curiosity, being swept away in deep and enthusiastic scientific dialogue with the young contestants over their work. The young water scientists thus form not only a part of a growing prize, but also an important part of the respected World Water Week and Stockholm Water Symposium.

Ms. Ashley Mulroy from the United States, the 2000 Prize winner, is a good example. Her project examined residual antibiotic contamination in public water supplies and was so cutting edge that it gained the interest of mass and scientific media in the United States, with publications like *USA Today*, *People* , *Readers Digest*, and *Water Environment & Technology* choosing to write about her.

After five years, what started out as a tiny little sibling to the Stockholm Water Prize has emerged as a mature and complementary institution on the Stockholm scene of global water excellence. ■

SIWI News

European Water Experts Meet in Stockholm



During the Swedish leadership of the European Union, SIWI arranged the European Water Experts Meeting in April on behalf of the European Commission and the Swedish International Development Cooperation Agency.

The meeting's central discussion point was the *Communication Note on Water Management in Developing Countries*, which documents the policy and priorities for the development co-operation by European countries.

"We are very pleased with the fruitful comments we received from all participants," said Mr. Ulf Ehlin, who represents SIWI in the expert group and is a co-author on the communication note. "This document will be a valuable tool for future EU decisions on water management initiatives in the developing countries."

Last year, SIWI presented a commissioned study entitled *Water and Development in Developing Countries.* Quantities of the report are still available.

Contact siwi@siwi.org for more information. ■

CSE Publishes Water Harvesting Guidebook

India's Centre for Science and Environment has published *Making Water Everybody's Business: Practice and Policy of Water Harvesting*, a follow-up to the popular *Dying Wisdom: Rise, Fall and Potential of Traditional Water Harvesting Systems.* The book, edited by Professor Anil Agarwal, Mrs. Sunita Narain and Mrs. Indira Khurana, provides up-to-date practices and policies related to rainwater harvesting. For more information on ordering the book, contact CSE by e-mail at cse@cseindia.org.

Prof. Agarwal and Mrs. Narain are speakers at the upcoming Stockholm Water Symposium. ■

2002 Stockholm Water Prize Nomination Period Remains Open

Nominations for the 2002 Stockholm Water Prize will be accepted by the Stockholm Water Foundation until September 30, 2001. The span of disciplines and activities from which a nominee may be chosen is very wide.

Nominated candidates may, for example come from fields such as natural science, technology and engineering, economy, health and water, water management, integrated water basin management, coastal zone management, wetlands, aquatic ecology, and water resources in any form.

The international scientific and environmental, professional and business sectors, as well as the general public, are invited to submit a nomination.

The Stockholm Water Prize was established by the Stockholm Water Foundation in 1990, and is supported by the Royal Swedish Academy of Sciences, Royal Swedish Academy of Engineering Sciences, International Water Association and Water Environment Federation.

The Stockholm Water Prize Founders are Anglian Water, Aragon Fondkommission, Bacardi Limited, Compaq, DuPont, Fujitsu Siemens Computers, General Motors, Grundfos, ITT Flygt, Kemira Kemwater, KPMG, Ragn-Sells, Scandinavian Airlines (SAS), Snecma, Stockholm Water Festival, Swedish State Railways (SJ), Uponor Group and Water Environment Federation.

To receive a nomination brochure, send an e-mail to siwi@siwi.org or visit www.siwi.org. ■

1994 Prize Laureate Translates 10-year Symposium Summary into Japanese

Dr. Takeshi Kubo, the 1994 Stockholm Water Prize Laureate, has completed and delivered to SIWI a completely translated and printed version of the 10-year conclusions from the Stockholm Water Symposium. In October 2000, Dr. Kubo met with Mrs. Gunnel Sundbom and Mr. Dave Trouba from SIWI at WEFTEC in Anaheim, California, and expressed an interest in translating the document, titled *No Freshwater Security without a Major Shift in Thinking.* Upon returning to Japan, Professor Kubo assembled a committee of experts to assist with the translation and the production. Professor Kubo and his colleagues are now undertaking a general distribution of the document to water scientists and professionals in Japan. ■

Transboundary Water Management as an International Public Good

A new study commissioned by the Swedish Ministry for Foreign Affairs within the project Development Financing 2000 will be released during the World Water Week in Stockholm and presented for the first time at the SIWI Seminar, "Water Security for Cities, Food and Environment Towards Catchment Hydrosolidarity," on August 18.

The study looks at transboundary water management through the lens of international public goods. From a development cooperation perspective it analyses and elaborates on the roles of different financial flows and mechanisms in the provision of regional water management. In a series of water basin case studies (in the Mekong, the Okavango, the Incomati, the Jordan and the Southern Caucasus basins) the study analyses the interplay between institutional arrangements, financial development, participation of civil society and legal and policy dimensions in providing and financing transboundary water management.

The study highlights ongoing work by actors such as the Global Environment Facility (GEF), UNDP, Global Water Partnership, Multilateral Development Banks as well as that of several bilateral agencies and non government organizations and suggests that a more co-ordinated approach to managing transboundary waters is needed.

The following key issues are examples of areas raised and addressed by the study in arguing for more co-ordinated transboundary water management:

- The need for a politically feasible environment when establishing the appropriate institutional framework for transboundary water management.
- A shift towards more process financing of sufficient duration to ensure continuity of institutional development rather than piecemeal project financing. New financing arrangements for transboundary water management, such as region- and basin specific trust funds, inter-riparian financing or an increased role for the private sector is also recommended.
- A larger role for regional economic groupings such as the European Union, the SADC or ASEAN is welcomed and the study advocates for developed partnerships between different regional councils. A more pro-active role in shared river basins for the EU with its new Water Framework Directive is also envisaged.
- The study also proposes a new facility with a specific mandate to assist regional management of transboundary waters. Such an International Shared Water Facility – which could be an alliance of key institutions – could serve as an international source of arbitration between riparians, help develop financing modalities and the operationalization of legal principles, and would support institutional development in water resources management within regional multilateral organizations.

For more information about the study and the Development Financing 2000 project please visit www.utrikes.regeringen.se/inenglish/policy/devcoop/financing.htm or contact Andreas Ershammar by e-mail at andreas.ershammar@foreign.ministry.se. ■

European Agenda 21 Leaders Issue Stockholm Statement

On the occasion of the Swedish Presidency of the European Union, representatives of European cities and towns as well as stakeholders active in Local Agenda 21 processes and water management met in Stockholm to discuss how Local Agenda 21 can contribute to a sustainable management of water.

The Fourth Session of the European Local Agenda 21 Roundtable was convened by the International Council for Local Environmental Initiatives (ICLEI) and hosted by the City of Stockholm, May 20–22, in light of the preparations towards the World Summit on Sustainable Development in South Africa in 2002.

Local Agenda 21 focuses on achieving and ensuring a high quality of life by making the community's management of natural and man-made resources sustainable. The 35 meeting participants discussed how modern water management solutions are increasingly non-technical and rely on participatory approaches, and how Local Agenda 21 processes can help to improve the dialogue between managers and users of water resources.

At the meeting's end, the participants issued the "Stockholm Statement" and requested the European Presidency to provide continuing patronage and support for European Local Agenda 21 Roundtable as a platform for debate and opinion-building among European stakeholders on local sustainable development issues.

For more information on the statement visit www.iclei.org.

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Seminar on Water Education in African Cities

A seminar on "Water Education in African Cities" is being organized by the UN Centre for Human Settlements (Habitat) in collaboration with SIWI and Swedish Water Development during the Stockholm Water Symposium on August 14 from 13.30 – 17.00. Topics to be discussed are value-based water education, introducing water education through the curriculum, community water education, and the role of water utilities in water education.

■

Publications from SIWI

Water Security – Opportunity for Development and Cooperation in the Aral Sea Area

Co-convened by the Swedish section of the United Nations Development Fund for Women (UNIFEM), the Royal Swedish Academy of Sciences, and the Stockholm International Water Institute, this seminar held in August 2000 presented ongoing framework programs, research work and future-looking methodologies to reach water security in the Aral Sea region.

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. This document has been mailed to all participants at the 10th Stockholm Water Symposium.

Water Harvesting for Upgrading of Rainfed Agriculture: Problem Analysis and Research Needs

This report, prepared by SIWI for the Foundation for Strategic Environmental Research (MISTRA), synthesizes the current level of understanding in the field of water harvesting for crop production, and identifies key research needs.

Based in three parts, the first presents the hydroclimatic constraints and challenges facing farmers and gives a brief presentation of water harvesting and strategies to manage water scarcity. Part two has regional approaches from sub-Saharan Africa, India and China. The last part identifies knowledge gaps that need to be filled, both regarding technical, process and systems research.

Also available:

- Water Security for Multi-National Water Systems
- Water and Development in Developing Countries
- Water Security for the 21st Century – Roles, Responsibilities and Opportunities for Industry
- No Freshwater Security Without Major Shift in Thinking: Ten-Year Message from the Stockholm Water Symposia
- Our Struggle for Water: Ten Years with the Stockholm Water Prize and the Stockholm Water Symposium

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.siwi.org to see all of the resources available from SIWI.

STOCKHOLM WATER FRONT
A Forum for Global Water Issues

Stockholm Water Front is published four times a year by the Stockholm International Water Institute (SIWI).

Publisher:
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Production:
Anna Lindberg

Design:
Quadrata HB, Stockholm

Printing: Arkpressen, Västerås

Circulation: 7.500

ISSN: 1102 7053

Stockholm Water Front is printed on Silverblade matte, 115 g paper, which has been awarded the Nordic Swan label for environmental quality.

Stockholm Water Front is available free of charge.

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The home page is updated on a regular basis. In particular, the "News" subsection, which can be accessed from the main menu, has the latest news about new SIWI publications, the upcoming Stockholm Water Symposium, the Stockholm Water Prize and Junior Water Prize activities, and more.

So, bookmark www.siwi.org today on your computer, and keep informed! ■