

## Foreword

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This special issue of the journal is devoted to the Hydrology for the Environment, Life and Policy (HELP) programme (<http://www.unesco.org/water/ihp/help>). It summarizes the outputs from two international HELP meetings, arranged by the Swedish International Hydrological Programme (IHP) Committee, in cooperation with the Stockholm International Water Institute (SIWI) and the Global Water Partnership (GWP).

The first meeting was a symposium on 'Increasing the Dialogue between Scientists, Policy-makers and Stakeholders' held in Kalmar, Sweden, in August 2002. The second meeting was a follow-up seminar on 'Towards Integrated Catchment Management: Increasing the Dialogue between Scientists, Policy-makers and Stakeholders', which was held at the Third World Water Forum in Shiga, Japan, in March 2003. During these meetings, the progress of the pilot basins in accomplishing the goals of the HELP programme were assessed to lay the groundwork for a second call for nominations of HELP basins to extend the global network. Both the Swedish basins from which HELP-related activities are presented in this issue are represented in this second call.

The Kalmar Symposium brought together 121 participants from 34 countries representing a range of scientific, legal, policy and management disciplines. Presentations of the work of selected pilot basins provided the basis for cross-disciplinary dialogue and produced a multitude of recommendations (for the HELP Symposium 2002, see <http://www.unesco.org/water/ihp/help>). Some of these recommendations are included in the Statement of the Symposium, which is reproduced after this Foreword.

### The HELP Initiative

HELP is a joint programme of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the World Meteorological Organization (WMO) led by the IHP. It was initiated because no comprehensive international hydrological programme addresses water issues in a field setting and integrates them with policy and management needs at the river basin or catchment scale, despite the many existing international activities in water resources. Eventually,

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the HELP programme will establish an extensive global network of catchments to improve the link between hydrology and the needs of society. It is the first global hydrology programme driven by social, environmental and management needs as opposed to purely scientific objectives (Endreny *et al.*, 2002). The programme fills an important gap in the understanding and management of water resources.

Three main issues have influenced the development of this policy- and development-driven international initiative:

- Progressive decline in catchment (experimental) hydrology. Knowledge from such research is needed to understand hydrological processes better and to support the testing and improvement of hydrological models.
- Significant, worldwide decline in the national support of basic, long-term hydrological data collection as reflected by the diminished global hydrometric network (notably in developing countries). Such long-term data are essential to evaluate the impacts of global change on water resources.
- Gap in the communication between scientists and the broad spectrum of water stakeholders, such as water policy experts and lawyers, water resources managers, and river basin communities.

To address these issues, the HELP initiative is designed to do the following:

- Facilitate the integration of hydrologists, social and economic scientists, water resources managers, water law and policy experts, and river basin stakeholder communities in setting a research agenda for the basin based on policy issues.
- Expedite the flow of research information for use in management and policy-making.
- Improve water-management policy by quantifying hydrologic uncertainty and increasing use of state-of-the-art knowledge of hydrological processes. Doing so will recover the costs of new investments (scientific, financial and human resources) in catchment experimental hydrology by developing and applying more useful hydrological models to the decision-making process.

The interdisciplinary nature of HELP makes it logical to build on some existing activities within both the UNESCO IHP and those activities elsewhere operating within various international programmes of Partners. When concerning the IHP *per se*, HELP is a crosscutting component of the Sixth Phase of the IHP programme, so both should be considered as one and the same. The emphasis of HELP is orientated towards implementing the IHP within a field setting (for 'Water Interactions: Systems at Risk and Social Challenges, Strategic Plan for the 6th Phase, 2002–2007', see <http://www.unesco.org/water/ihp>).

The above approach provides 'added value' and is cost effective because it avoids the wasteful duplication of competing, overlapping projects by formulating alliances and partnerships at both the international and national levels. Those activities outlined under the 'Water and Climate' policy issue by Mike Bonell in the first paper, for example, closely follow the preceding position. In other cases, there remain gaps in the required research, which HELP intends to fill. Within the IHP, HELP is trying to foster a more integrated, interdisciplinary approach to experimental hydrology research by bringing together elements from surface water–groundwater–ecohydrology–pollution transport, and by the application of isotopic/non-isotopic tracers so that lateral fluxes (both water quantity and quality) are better addressed. Elsewhere, the two-way process of

interfacing scientific research needs and outputs with water policy and law remain an unfilled niche that HELP will address.

Following a review of progress made within the Pilot phase HELP basins, the Kalmar Symposium produced a multitude of recommendations arising out of four cross-disciplinary working groups. Some recommendations were subsequently condensed within the Statement of the Symposium. Based on these recommendations and on conclusions from a series of programme development meetings that began in mid-1998 to conceptualize the HELP initiative, the HELP Task Force and UNESCO defined a set of HELP basin guidelines to assist in the selection of a preliminary set of pilot study catchments. Many of these basins were already part of other international and national programmes, but they all had two things in common:

- Stakeholders were involved in the identification of local water issues.
- Catchments provided a framework for the joint study of the physical, social and policy factors that affect water management.

By early 2001, 25 basins widely distributed around the world had been evaluated for inclusion in HELP. All these basins were unsolicited and expressed voluntarily an interest in becoming part of the HELP programme. These basins made up the initial Pilot phase network.

The papers in this special issue illustrate the successes and difficulties in applying the defined strategies. The first by Bonell elaborates on selected follow-up actions the HELP programme will take in response to the Kalmar Symposium. For an effective dialogue, it is essential that the participating parties can start from some sort of basic worldview, in other words share a pre-analytical mental image of the issue before them. This can start from an image of the catchment where it can be clarified how different water interests and ecosystems are interrelated. To facilitate the dialogue at the symposium, a background worldview report was prepared with this particular purpose by an interdisciplinary team of two natural scientists (Malin Falkenmark and Lars Gottschalk) and two social scientists (Jan Lundqvist and Patricia Wouters). That report was also available at the Shiga Seminar and is included in this issue. Their paper is followed by a series of case studies taken from the pilot basins, and from two Swedish basins that have responded to the second call for a proposal for HELP basin status. The case studies include: the Motueka River (New Zealand), the Thukela River (South Africa), the Em River (Sweden), the Upper San Pedro River (Mexico/USA), Lowland Catchment Research (UK), the Luquillo Mountains (Puerto Rico), the Motala River (Sweden), the Murrumbidgee River (Australia), the Subernarekha River (India) and Lake Ontario (Canada/USA).

The preceding overview has outlined some of the research gaps that HELP intends to address. Moreover, as emphasized, the interdisciplinary nature of HELP makes it logical to build on some existing activities within both the UNESCO IHP and those activities operating elsewhere through alliances with various international programmes of partners in the HELP initiative to avoid wasteful duplication in projects. It is hoped that the resulting improvement in communications between international and national hydrological and other water- and land-management programmes will accelerate the generation and application of hydrological understanding. Such steps are needed to help mitigate many of the pressing water issues facing people around the world and lead to a more sustainable society.

## Reference

Endreny, T. A., Wallace, J. & Schulze, R. (2002) U.N. hydrology initiative pairs societal needs with science, *Transactions of the American Geophysical Union, EOS*, 83(50), p. 592.

## **Appendix: The HELP Symposium 'Towards Integrated Catchment Management: Increasing the Dialogue between Scientists, Policy Makers and Stakeholders', Kalmar, Sweden, 18–22 August 2002**

### *Statements of the Symposium*

A unique mixture of water-related scientists, policy-makers, managers and stakeholders met at the symposium to discuss and exchange experiences on how to increase and strengthen the dialogue between these groups in order to facilitate a more integrated approach to land and water management.

The symposium was held within the framework of UNESCO and WMO's joint HELP programme. This programme is specifically designed to contribute social, legal, economic and environmental benefits to communities through sustainable and appropriate use of water by deploying hydrological and other water-related sciences in support of improved integrated catchment management. Central to HELP is a grass-roots, needs' driven, science agenda with tangible social and ecological benefits.

The primary goal of the United Nations Millennium Declaration of halving world poverty, ill health and hunger by 2015 was acknowledged. Participants reiterated that water is key to sustaining welfare, ensuring food security, improving health and reducing poverty.

As water flows through catchments, it connects human activities with natural ecosystems, which often generates conflict over water uses. In order to meet the Millennium Declaration goals, it will be necessary to evaluate future development alternatives through integrated land and water resources management. In this way, an acceptable balance between society and nature can be found. Four major actors have to be involved: stakeholders, policy-makers, managers and scientists.

Through discussions of HELP basin case studies from Africa, South Asia, North America and Australasia, the symposium identified several successful approaches with generic value in promoting sustainable land and water management:

- Creation, expansion and use of frameworks that enable water law and policy experts, water resources managers, stakeholders, and scientists to work more closely together on water-related issues.
- Stimulation of the scientific community to develop methods appropriate for dealing with stakeholder-defined issues.
- Communication of scientific information, both physical and non-physical, that identifies risks and uncertainties, evaluates options, and anticipates potential impacts of future management strategies in a way that can be easily understood by stakeholders and decision-makers.
- Encouragement of actions based on well-informed and balanced decisions in the multiple uses of water.

Efforts must be made to build upon the successful experiences of the HELP

basins in catchment management worldwide. Participants encouraged partnerships and donors to strengthen their commitment to HELP and other programmes advocating integrated approaches to land and water management and research.

Finally, the symposium strongly encouraged the inclusion of these messages at the deliberations at the World Summit on Sustainable Development in Johannesburg, South Africa, in August 2002; at the Third World Water Forum in Kyoto, Japan, in March 2003, and at other relevant international water and sustainable development fora.

### *Outputs and Recommendations from the Working Groups*

*Stakeholder dialogue: steps, options, barriers and how they can be overcome.* Stakeholders were defined as representatives of people or organisms that will be directly affected by or have a vested interest in water management. It was emphasized that consideration must be given to representatives versus all, residents versus non-residents, humans only versus all organisms, and policy-makers versus scientists.

Identification of stakeholders should be seen as a process not an itemization. Members can be identified from existing groups and organizations, lists of stakeholders from previous efforts, those with legal water rights and formal permits (consumptive/non-consumptive), the media: television, radio, newspapers, the Web; and annual public meetings.

The key points from the discussions were that: (1) no one method is sufficient; (2) process should be self-selecting and ongoing; (3) never exclude any party; and (4) keep in mind those with a voice versus the voiceless.

A number of barriers for stakeholder involvement (e.g. solutions) were identified including: (1) top-down control (promote grass roots); (2) institutional/agency constraints (make agencies aware of benefits and progress); (3) a lack of transparency (inform at all phases of the project); (4) competition among stakeholders (partners rather than competitors, win-win solutions); (5) racial issues/political alignments (mediation, socio-political change); (6) apathy (make it fun or expensive); (7) pessimism (celebrate small successes); (8) time and money constraints (flexible scheduling and locations, child care, etc.); (9) not empowered to participate (communication and education); (10) personal conflict (facilitated discussions); (11) a lack of a perceived problem (communication and education); and (12) too long term, no priority (modelling, make long-term effects tangible).

The following methods for involvement were identified: (1) provide financial support for active groups; (2) actively recruit representatives; (3) select attractive meetings times and locations; (4) promote partnerships; (5) use information technology (but be aware of its limitations); and (6) arrange field days and festivals to engage stakeholders indirectly.

The following recommendations for future HELP initiatives were given: (1) begin inclusive stakeholder involvement from the start; (2) use existing forums; (3) keep working groups small and local; (4) give stakeholders a strong role and remain flexible; and (5) identify important social, racial and/or political social issues that are barriers to stakeholder involvement. The need for enlightened and impartial leaders was also noted.

*Rules and Roles in Integrated Water Resources Management (IWRM): Institutions and Instruments in Policy-making, Roles Given to Stakeholders*

It was stressed that in order to answer the question of what is needed for successful implementation of IWRM, it is necessary to define 'success'. It must be defined by those with a vested interest in IWRM, and is primarily the responsibility of individuals within a catchment area. It should not be predetermined and static. Success must involve a process of engagement, adaptation and learning that accounts for social, economic and environmental needs, while also taking into account advances in knowledge. Suggested indicators of success included the following components: (1) IWRM should include the aspect/focus of not only water, but also land; (2) all stakeholders should be able to participate on an equal basis; (3) communication of the process and results must be key project components; (4) there is a need for funding to assure a long-term commitment; (5) projects have to be 'issue' rather than science driven; and (6) the direction of the project should be guided by feedback from monitoring and evaluation (all disciplines).

With regard to institutional support for the application IWRM, it was concluded that there is a fundamental need for a river basin institution responsible for coordinating the interests of all stakeholders within the entire river basin. Diversity of concerns is best addressed with a multi-institutional (interdisciplinary) composition working in partnership.

The following criteria were identified with regard to institutional support: (1) river basin level institutions must be supported by local, national, regional and international institutions; (2) policy and legal instruments must be provided to ensure that the river basin institutions can operate successfully at all geographical levels; (3) IWRM will only be successful if all the relevant institutions adhere to, and coordinate to promote, the core values of IWRM as outlined in the 1992 Dublin Principles; and (4) the project setting is the basis for the relevant institutions that will participate (e.g. cultural, demographic, political).

The following recommendations were given with regard to policy-making and legal instruments needed to support IWRM: (1) there should be affirmation of official support for a HELP basin by recognition at the appropriate level; (2) an in-place law that conceptualizes IWRM is desirable (lacking that, political agreements or commitments by government agencies with authority in the basin should be negotiated); (3) successful IWRM requires the law to recognize that all individuals have a right to water of sufficient quantity and quality to meet their basic needs; (4) successful IWRM requires the law to recognize the need for safeguarding ecosystem integrity; and (5) water rights must be enforced through a legal and regulatory system for allocating the uses of water that reconciles both the short- and long-term interests of existing and future users.

With regards to roles given to stakeholders and scientists/experts, it was agreed to be more important to identify who should determine the roles than to identify what those roles might be. Consequently, (1) stakeholders should have the primary role in defining the issues that are important to them and calling for the appropriate support of experts in IWRM and should ideally organize themselves; (2) experts in IWRM have the responsibility to provide stakeholders with adequate and coherent information in order for the stakeholders to evaluate options and reach effective decisions; (3) experts also have the responsibility to ensure that stakeholders are made fully aware of the inherent uncertainty of

scientific information; (4) scientists must be recognized as impartial and credible in order to provide knowledge base and advice that can support decision-making; (5) consensus should be the basis for action; and (6) mediation should be incorporated as needed to meet this goal.

*How to Reach Acceptance of Change and Possible Shortcuts to Societal Acceptance*

The following barriers for acceptance of change were identified: (1) poor conceptualization of water holistically; (2) a lack of resources; (3) a lag in time between remedies and visible impacts; (4) poor identification of stakeholders or of the legitimacy of group representatives; (5) inadequate legislation; (6) a lack of leadership; (7) inadequate institutional arrangements; (8) a lack of adequate information or poor liability and accountability, and non-defined levels of uncertainty (scientific community); (9) a lack of awareness of issues, ownership and stakes; (10) a lack of appropriate communication and liaison strategy; (11) a lack of reciprocal trust and transparency; (12) a lack of overall engagement; (13) a lack of a common level of operation; (14) a lack of direct relevance; (15) a lack of formal and informal education at different levels; (16) a lack of local people to convey the message; and (17) cultural beliefs, values or attitudes resistant to change.

The following strategies and methods were identified in order to overcome obstacles: (1) assess communication needs before a HELP project starts; (2) increase education and capacity building; (3) identify drivers (individuals, groups, organizations, etc.); (4) make a clear assessment of the benefits of IWRM for the wider community, including accurate definitions of problems and presentations of alternative solutions in order to increase awareness; (5) use demonstration projects that point to success; (6) implement IWRM principles in a wide collaborative fashion that brings together different parties; (7) make the IWRM process transparent and open (build reciprocal trust and transparency); (8) establish a legislative basis for IWRM; (9) define a formal structure or mechanism to bring the different parties together in the management of the catchment; (10) use a continuous, iterative, all-inclusive process; (11) consider social aspects; (12) focus on adequate geographic areas that are manageable; (13) enhance law enforcement in some particular basins; (14) use financial incentives; (15) cultivate and promote ownership by different stakeholders; (16) promote societal-relevant science; and (17) promote mechanisms for stakeholder empowerment.

With regard to the roles of stakeholders, it was emphasized that: (1) stakeholders should be empowered within legal, societal norms and biophysical constraints; (2) they should be the owner of the process; (3) they should be proactive, engaged and responsive with an ethical sense; (4) they should ensure sanity of outputs; and (5) they should begin chain reactions in carrying forward the message to the wider community.

With regard to policy-makers and scientists, it was stressed that they need to be impartial and professional. Scientists need to become change agents and to cross borders. Policy-makers, scientists and the wider community need to realize the importance of applied and multidisciplinary science and institute reward and funding mechanisms.

The following recommendations for future HELP initiatives were given: (1) carry out future HELP meeting or activities in HELP catchments; (2) use a

holistic approach to explain, promote and implement IWRM; (3) improve the promotion of the HELP approach and philosophy in IWRM; (4) find ways for people having a similar specific function to get together during meetings through electronic discussion, conferences or other means (horizontal integration); (5) develop in consultation with the HELP network indicators and parameters to be applied to evaluate the development of IWRM in individual catchments; (6); scientists should provide appreciation of uncertainties of data and outputs; (7) one should not get rid of good things from existing practices but build on what is already there; and (8) in further developing the HELP agenda, compile and take into consideration the barriers, methods and strategies identified in the symposium.

*Answers Required from Scientists, Bottlenecks and Paradigm Locks, and Research Needed to Overcome Such Locks*

Finally, the conditions needed to break the paradigm lock in a HELP basin were identified. It was emphasized that IWRM is more than hydrology: there is also a need to break paradigm locks between disciplines. It was also concluded that discrepancies exist between available research tools and tools needed for IWRM, and that there is a need for improved paths for communication between scientists and policy-makers and between scientists and stakeholders.

The following recommendations with regard to education and research on IWRM were given: (1) there is a need for change in education, with a balance between depth and width; (2) keep one's identity (disciplines) and promote collaboration in interdisciplinary groups where one's skill fits in; (3) the dialogue must start already when the first questions are asked and keep going; (4) scientists are knowledge generators but must also be cognisant of indigenous knowledge and be good listeners; (5) to ensure that all voices are heard fairly, professional mediation may be necessary; (6) funding agencies should give direction but not be prescriptive; (7) to maximize communication with all relevant stakeholders at an early stage of a project, scientists should identify who the decision-makers are and understand the context of decision-making; (8) objective, respected institutions such as universities or independent organizations should facilitate fora for bringing stakeholders together in a neutral arena; (9) the credibility of scientific results must be earned by gaining the trust of all parties concerned; and (10) in addition to disseminating their work through conventional channels, scientists should work to translate their findings to the public at large and policy-makers.