



World Health Organization
Sustainable Development
and Healthy Environments

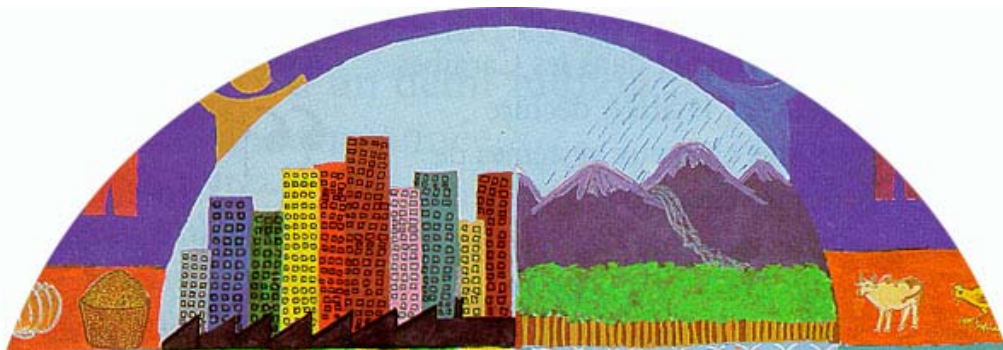


International Workshop

Health as a Cross-cutting Issue in Dialogues on Water for Food and the Environment

Amman, Jordan

15-18 December 2003



**Protection of the Human Environment
Water, Sanitation and Health**

Geneva, 2004



Health as a Cross-cutting Issue in Dialogues on Water for Food and the Environment

Report of an International Workshop

Jointly organized by WHO and InWEnt (Capacity Building International)

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Protection of the Human Environment
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About the Dialogue

The Dialogue on Water for Food and the Environment was established in August 2001 with the development objective to improve water resources management for food security and environmental sustainability, with a special focus on the reduction of poverty and hunger, and the improvement of human health. Ten Participating Organizations collaborate to achieve this objective through the promotion of transparent dialogues and knowledge sharing at the international, national, river basin and local levels, with a view to bridging the gap between food and environmental sectors on potential conflicts over water use. The Dialogue is a time-limited initiative that will report to the fourth World Water Forum in Mexico in 2006. The Dialogue Secretariat is hosted by the International Water Management Institute (IWMI) in Colombo, Sri Lanka.

More information can be obtained from:

www.iwmi.cgiar.org/dialogue.

About the Water, Sanitation and Health programme of WHO

The World Health Organization's Water, Sanitation and Health (WSH) programme aims to reduce water- and waste-related diseases and to optimise health benefits of sustainable water and waste management. Its core staff in the Department of Protection of the Human Environment at WHO headquarters, Geneva collaborates with WSH staff in the six WHO Regional Offices and in WHO Country Offices. The WSH programme component dealing with Health in Water Resources Development focuses on Health Impact Assessment, the promotion of water management for health protection and the links between biological diversity and health. WHO is one of the ten Participating Organizations of the Dialogue. It maintains programmatic links with several other Dialogue partners, including FAO, UNEP, IUCN, WWF and IWMI.

More information can be obtained from:

www.who.int/water_sanitation_health/resources/en.

About InWEnt

InWEnt – *Internationale Weiterbildung und Entwicklung gemeinnützige GmbH* (Capacity Building International, Germany) is an organization for international human resources development, advanced training and dialogue. It was established through a merger of Carl Duisberg Gesellschaft e.V. and the German Foundation for International Development and can draw on decades of experience in international co-operation. Its practice-oriented programmes are directed at experts, managers and decision-makers from business and industry, politics, public administration and civil society from all over the world. Its Development Policy Forum organises a high-ranking, informal dialogue on current issues of development policy.

More information can be obtained from: www.inwent.org.

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**REPORT OF AN INTERNATIONAL WORKSHOP
ON HEALTH AS A CROSS-CUTTING ISSUE
IN DIALOGUES ON WATER FOR FOOD AND THE ENVIRONMENT**

Introduction

An International Workshop on health as a cross-cutting issue in dialogues on water for food and the environment was held at the Holiday Inn Hotel, Amman, Jordan from 15 to 18 December 2003. The workshop was jointly organised by the World Health Organization and the German InWEnt (*Internationale Weiterbildung und Entwicklung gemeinnützige GmbH* - Capacity Building International)

The workshop was attended by 31 participants from twelve countries, eight pertaining to the WHO Eastern Mediterranean Region: Afghanistan, the Islamic Republic of Iran, Jordan, Morocco, Oman, Tunisia, Syria and the Republic of Yemen, three to the WHO South East Asia Region: Indonesia, Sri Lanka and Thailand, and one to the WHO Western Pacific Region: the Philippines. In addition, four resource persons and five Secretariat members were in attendance. The workshop was jointly facilitated by Robert Bos (WHO) and Domitille Vallée (Dialogue Secretariat). Drs Hans Wolter (InWEnt) and Kazi Jalal (a member of the Dialogue Scientific and Technical Advisory Panel) served as rapporteurs. The complete list of participants is presented in annex 1.

This workshop was organised under the Dialogue initiative with support from InWEnt, WHO headquarters (Water, Sanitation and Health programme) and the WHO Regional Office for the Eastern Mediterranean (Communicable Disease Control programme). The logistic arrangements were made by the WHO Centre for Environmental Health Activities (CEHA) which is based in Amman.

The context

The workshop was organised in the context of the programme of the Dialogue on Water for Food and the Environment. The origins of the Dialogue initiative are explained below. The World Health Organization is one of ten Participating Organizations in the Dialogue – the other ones are the Food and Agriculture Organization of the United Nations, the Global Water Partnership, the International Commission on Irrigation and Drainage, the International Federation of Agricultural Producers, the International Water Management Institute, the United Nations Environment Programme, the World Conservation Union (IUCN), the World Water Council and the World Wildlife Fund.

At its inception, the promotion of human health was explicitly included in the development objective of the Dialogue. It is an issue of crucial importance in the context of conflicts over water use alternatives. From the perspective of water for agricultural production, on the positive side issues of food security and adequate nutrition prevail, but there are negative health implications possible that include a number of water-associated infectious diseases and exposure to increased levels of pesticides and their residues. From the perspective of ecosystem integrity the ecosystem services and products provided by aquatic systems, particularly wetlands, contribute importantly to health, yet communities in wetland areas have their specific health problems as well: water-related infectious diseases, difficulties in achieving adequate sanitation and, importantly, hampered access to health services at times when floods disrupt transport and communications. There is also always the risk of psycho-social disorders linked to the displacement and resettlement of people as a result of water resources development.

Health is, therefore, an important component in dialogues on water for food and the environment, at the levels of policies, programmes and local action, with Health Impact Assessment (HIA) and health

risk management being major dimensions. In fact, community health status is a critical indicator for the success or failure of a dialogue process.

The health component is developed relatively late in the Dialogue's evolution, and this is due to its cross-cutting nature. It was important to let national and basin-wide dialogues come to some level of consolidation before introducing this component. As the Dialogue goes into its second and final phase, it is timely to put more emphasis on health, and that is exactly what this workshop set out to do.

The objectives

In October 2003, agreement was reached between WHO, InWent and the Dialogue Secretariat on the following objectives for the workshop:

- To review critical health issues in the context of dialogues on water for food and the environment
- to review the impact of irrigation development on health in communities and to discuss the applicability of health guidelines/ recommendations in the context of irrigation schemes in the Eastern Mediterranean and South/South-East Asian regions
- to design mechanisms, institutional arrangements and incentives for the effective incorporation of health into dialogue processes, together with indicators of success
- to review current and planned Dialogue activities and make recommendations on the incorporation of human health as a cross-cutting issue
- to define the expected outcome on human health of the Dialogue product to be prepared by 2006

Based on the above objectives, the expected outputs were defined to include:

- (1) a report of the workshop
- (2) an inventory and endorsed assessment of health components in on-going and planned national and basin-wide dialogues and local action activities under the Dialogue Initiative
- (3) draft proposals for health activities in a number of selected dialogues at the national and river-basin level
- (4) recommendations for mechanisms and procedures for the incorporation of health into all Dialogue activities, including a resource mobilisation strategy, with a special focus on irrigation schemes and environmental conservation

In order to achieve the objectives and produce the expected outputs, a proposed agenda and programme of work were developed, which were submitted to the workshop plenary on the first morning and approved. They are attached as annexes 2 and 3.

Proceedings

1. Opening ceremony

Three statements preceded the official opening address by the Director, Primary Health Care, Ministry of Health, Jordan. Dr Thomas Petermann, representing the German InWent, stated that since 1969 his organization had been engaged in capacity building in all aspects of development co-operation together with sister organizations GTZ and KfW. Ms Christine McNab, the UN Resident Coordinator in Jordan, stated that in today's world people were facing two types of threats: hard threats (terrorism, war) and soft threats (diseases, chronic malnutrition). She was not sure if the hard threats would rank higher as concerns to under-privileged citizens than soft threats. She complimented WHO for becoming the champion of environmental health activities through its regional centre CEHA. Dr Muhamet Ali Khan, the Acting Representative of WHO in Jordan, reminded the audience of the eight Millennium Development Goals (MDGs), seven of which addressed mainly governments of developing countries who faced daunting challenges. In four of the MDGs, human health was an

explicit or implicit focus. Yet, equally important was the eighth goal for which the main responsibility lies with the developed countries, to provide a fair framework for international trade, financial support and the re-distribution of wealth.

The workshop was then formally opened by Dr Bassam Hajjawi, Director, Primary Health Care, Ministry of Health, Jordan, who expressed the interest of the Government of Jordan in the subject addressed by the workshop and wished the participants good luck in their deliberations.

Following the opening session, the participants became acquainted with one another in a round of introductions, and the objectives, expected outputs and workshop arrangements were presented.

2. Introducing the Dialogue and health as a cross-cutting issue.

Under agenda item 4, Domitille Vallée presented the origins, objectives and scope of the Dialogue on Water for Food and the Environment. The initiative had materialised in the wake of the second World Water Forum (The Hague, 2000), where the potential conflict between the agricultural production sector and nature conservation groups over fresh water use had become apparent. The agricultural community was emphasising the need to maintain food security and reduce hunger and rural poverty for a growing world population and had concluded that 15-20% more water would have to be made available for irrigated agriculture in the coming 25 years. Nature conservation organizations, for their part, had pointed to current damages to ecosystems resulting from excessive water use and pollution by the agriculture sector and had claimed that current use levels should be reduced by 10% at least.

At a meeting in Stockholm in 2000, the idea was conceived to set out on a dialogue approach. Full details of the initiative had been worked out at a workshop at the International Water Management Institute, Colombo, Sri Lanka in December of the same year.

In August 2001, the Dialogue on Water for Food and the Environment was launched officially at the annual Stockholm International Water Symposium as a time-limited initiative of ten international agencies that would report to the fourth World Water Forum in Mexico in 2006. The development objective of the Dialogue was to improve water resources management for food security and environmental sustainability, with a special focus on the reduction of poverty and hunger, and the improvement of human health.

To achieve this objective, the Dialogue programme was designed to be both output and process-oriented. It aimed to assist countries to find tangible solutions to existing or potential conflicts over food security and environmental sustainability, at the national (policy), river basin and local (operational) levels. It also aimed to build a body of knowledge through social learning on the process of solving the dilemma between 'water for food' and 'water for the environment'.

The Dialogue had made considerable progress since its launch:

- Formal agreement on Dialogue Arrangements between the ten Participating Organizations, which included the three relevant UN agencies (United Nations Environment Programme, the Food and Agriculture Organization of the UN and the World Health Organization)
- Design of its global programme through three Workshops :
 - on the nature, structure and contents of the Dialogue knowledge base
 - on the characteristics of national and basin-wide dialogues
 - on ways to integrate local action and best practice
- The organization of an International Water Conference in Hanoi, gathering all Dialogue partners to build a common understanding of the programme

- Ongoing design of the Dialogue Learning and Operational Framework
- Over 30 Dialogue activities initiated on the ground at global, national and basin levels

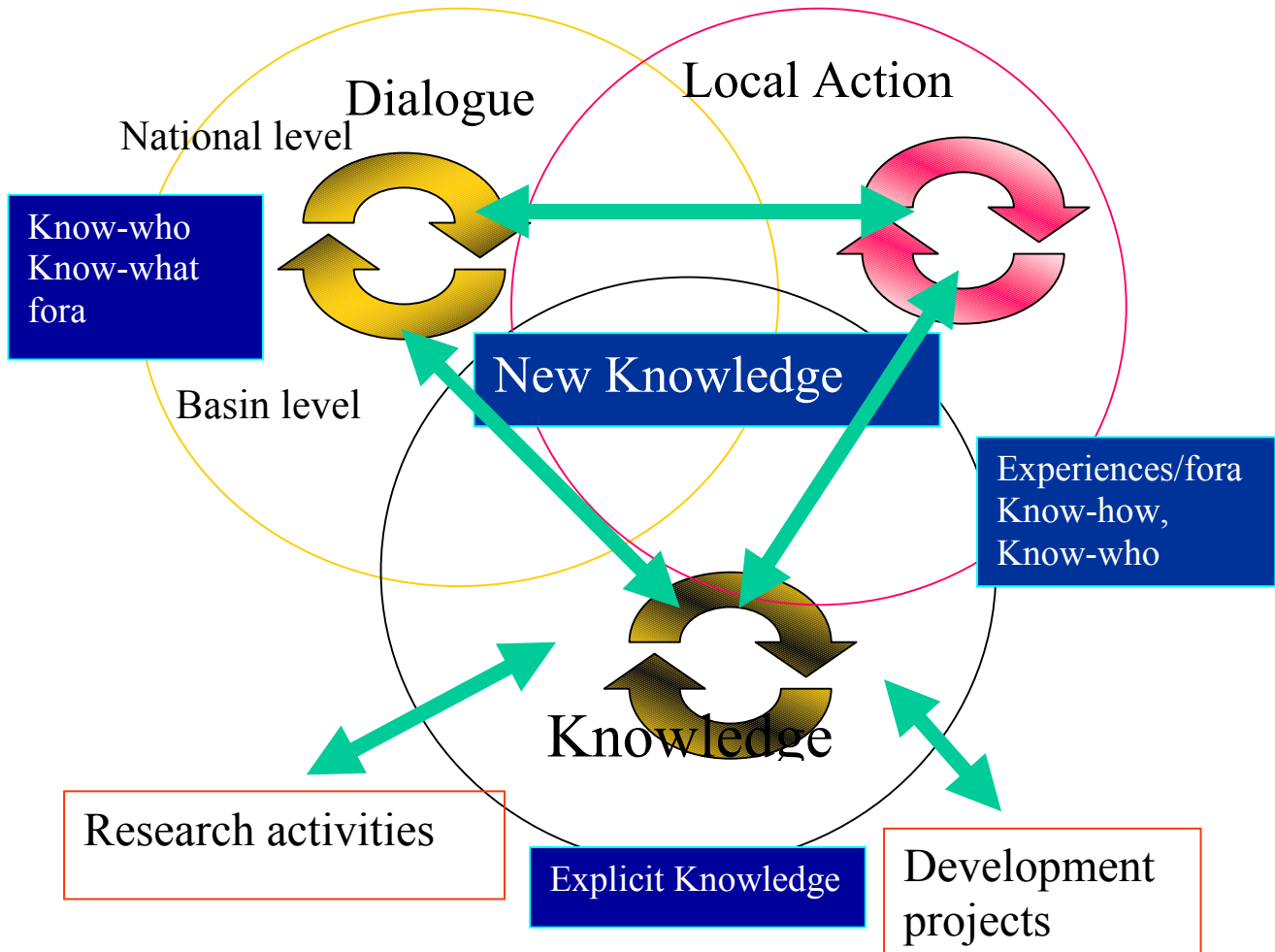


Figure 1. A graphic representation of the Dialogue on Water for Food and the Environment (Adapted from a graph prepared by Rivka Kfir for the Dialogue)

In this presentation on health as a cross-cutting issue in dialogue, Robert Bos focused on the scope of water-related health issues, some new goals and concepts, and the relevant aspects of water supply and sanitation, water resources development and management and water policy.

The traditional perspective of water associated diseases of some 30 years ago, with its main focus on drinking water supply and sanitation, had evolved into a more comprehensive concept of water, sanitation and health. This broad concept considered all health aspects of water resources development and management, for drinking water supply, sanitation, irrigation, energy generation, flood control and navigation. It took account of both the health determinants related to these various water uses, as well as of the options for water supply and water management interventions to protect and promote health, and to select those intervention options that ensure maximum health gains at the lowest cost.

The Burden of Disease concept, developed by the World Bank and WHO in the 1990s, provided a tool to set priorities in the long list of diseases, at least at the global and regional level, through the attribution of a common measure, the DALY (Disability Adjusted Life-Year). Table 1 below lists the official 2001 global mortality and Burden of Disease estimates for a number of important water associated diseases. These should be considered against the backdrop of a total number of deaths of 56 552 000 and a total estimate of the Burden of Disease of 1,467,183,000 DALYs lost in that same year.

The policy basis for the integration of water use policies and strategies started with Agenda 21, the blue print for sustainable development that had resulted from UNCED in Rio de Janeiro in 1992. The concept of Integrated Water Resources Management (IWRM) had given further shape to this Agenda 21 recommendation, and as a result many countries were now in the process of developing national or basin-wide water resources development and management policies and strategies. As the pressure on water resources was increasing and water quality was deteriorating, the IWRM process was, for a considerable part, about conflict resolution. In this context, health was a cross-cutting issue. As environmental and social determinants of health change in the process of IWRM decision-making, so does the health status of local communities. These changes may be positive or negative, and the point of including health into dialogues is to ensure that any inadvertent negative health impacts are prevented or, at least, mitigated. Considering health in a cross-cutting way also offers opportunities for targeted health promotion through improved water supply and management.

Table 1. Global mortality and BoD estimates for a number of water-associated diseases (2001)

	<i>Deaths (in thousands)</i>	<i>Burden of Disease (in thousands)</i>
<i>Infectious diarrhoea</i>	2 001	62 451 (4.3%)
<i>Malaria</i>	1 123	42 280 (2.9%)
<i>Schistosomiasis</i>	15	1 760 (0.1%)
<i>Lymphatic Filariasis</i>	0	5 644 (0.4%)
<i>Onchocerciasis</i>	0	987 (0.1%)
<i>Dengue fever/DHF</i>	21	653 (0.0%)
<i>Intestinal helminth infections</i>	22	9 361 (0.6%)
<i>Japanese encephalitis</i>	15	767 (0.1%)
<i>Trachoma</i>	0	3 997 (0.3%)
<i>Drowning</i>	402	11 778 (0.8%)

Source: World Health Report 2002

With respect to water supply and sanitation it was noted that the WHO/UNICEF 2000 Global Water Supply and Sanitation Assessment showed:

- 1.1 billion people to lack access to improved water supply
- 2.4 billion people to lack access to adequate sanitation
- Asia as having the highest number of unserved people in absolute terms
- *Proportionally, the group of unserved to be biggest in Africa*

Recent WHO analyses to attribute a disease burden to water, sanitation and hygiene risk factors show that they account for 2.1 million deaths each year (3.9% of total) and 76 million DALYs lost each year (5.3% of total).¹

¹ Pruess, A. *et al.* (2002). Estimating the Burden of Disease from Water, Sanitation and Hygiene at a Global Level. *Environmental Health Perspectives* 110(5): 537-542

With respect to health implications of water resources development and management, there were many issues of local or regional importance, but globally four vector-borne diseases stood out: malaria, schistosomiasis, lymphatic filariasis and Japanese encephalitis. Some basic 2001 statistics included:

Malaria	300-500 episodes annually	> 1 million deaths a year	42.3 million DALYs lost in 2001
Schistosomiasis	200 million people Infected	15,000-100,000 deaths a year	1.8 million DALYs lost in 2001
Lymphatic filariasis	120 million people infected	no immediate deaths	5.6 million DALYs lost in 2001
Japanese encephalitis	50,000 clinical cases reported annually	15,000 deaths in 2001 fluctuates from year to year	767,000 DALYs lost in 2001

The attribution of the burden of disease to specific components of water resources development continued to be a complex challenge, but well-documented case studies of health impacts were readily available:

- In the Ethiopian province of Tigray micro-dams caused a seven-fold intensification of malaria transmission intensity
- Following the construction of the Diamma Dam in Senegal, irrigated rice and sugar cane schemes, combined with mass migration and lack of adequate sanitation caused the intestinal schistosomiasis prevalence rate to explode from 0 to 90% in the township of Richard Toll
- Irrigation extension combined with pig rearing resulted in significant Japanese encephalitis outbreaks in Sri Lanka's Mahaweli System H

Finally, in a more strategic way, there were clear links with and opportunities for health in water policy formulation. One clear example was the Ethiopian Water Sector Development Programme, which foresaw, by 2016, urban water supply coverage to increase from 74 to 98%, rural water supply coverage from 23 to 71%, small scale irrigation development from 200,000 hectares to 327,000 hectares of land, as well as an expansion of some 147,000 hectares of medium and large scale irrigation, and the completion of six medium-scale and 15 small-scale hydropower plants, with 63 medium-scale and 67 small-scale hydropower plants in some stage of development.

An estimated US\$7.5 billion would be needed over the next 15 years to achieve the objectives contained in the programme, sub-divided over water supply and sewerage extension (39%), hydropower capacity development (26%), irrigation development (23%), water resources management (9%) and institution/capacity building (3%).

A review of the policy criteria revealed a number of health promotional opportunities in this Ethiopian example, which thusfar had not been seized:

- the development and application of BoD criteria in selecting where water supply and sewerage extension would be targeted, to achieve maximum health gains through minimal investments;
- the promotion of small-scale hydropower plants to reduce indoor air pollution, as part of hydropower capacity development;
- the selection of infrastructure designs and water management methods with minimal vector-borne disease risks in irrigation development;
- the establishment of Health Impact Assessment as part of planning procedures for water resources development;
- the development of skills in intersectoral decision-making in support of health as a basis for institution/capacity building.

3. Review of critical health issues in the context of dialogues on water for food and the environment

Next, the participants were divided into five groups, each with the task of a rapid scoping exercise to identify and prioritise, for their region, critical health issues linked to water resource development for irrigated agriculture and to the conservation of aquatic ecosystems; they were also invited to analyse the environmental and social determinants of the health issues identified. They worked in five groups: Southeast Asia (Indonesia, Philippines and Thailand); South Asia (Afghanistan, India, Sri Lanka); Eastern Mediterranean I (Iran, Jordan, Lebanon, Syria) and Eastern Mediterranean II (Morocco and Tunisia) and Eastern Mediterranean III (Oman and Yemen).

The South East Asia group identified health issues in relation to specific water uses.

Improper irrigation management caused malaria; the use of irrigation canals for hygiene purposes resulted in increased burdens of water-borne and water-washed diseases; pesticide and fertiliser uses in irrigated orchards resulted in contaminated drinking water. Deforestation and climate change, indirectly linked to water resources development, also had important repercussions for health.

In relation to the provision of safe drinking water, key health issues included the vulnerability of groundwater quality due to contamination with pesticides, their residues and trace heavy metals in the process of natural recharge; and, the infiltration of groundwater by micro-organisms. It was also noted that excessive extraction of groundwater caused land subsidence and sea water intrusion; improper management of estuary dams could cause outbreaks of malaria; and, degradation of watersheds caused depletion of water supply and potential contamination of groundwater

Among the various health determinants, the following were particularly noted: economic factors that encouraged the excessive use of fertilisers and pesticides; mono-cropping activities in recharge areas; poor enforcement of environmental laws; international demand for sweet banana; and, the construction of dams without proper communication with local communities, which led to social conflicts on resettlements and existing water uses. The lack of co-ordination and consultation on project development continued to hamper proper attention to cross-cutting health issues in dam projects.

The plenary discussion centred on the linkages between irrigated rice cultivation and malaria. There was a consensus that socio-economic development overall improves the general health status, but that planning and operational procedures needed to focus on preventing health hazards, such as malaria, from turning into increased risks for vulnerable communities. Health Impact Assessment could play a crucial role in this respect. The effects of privatisation of drinking water supply schemes on human health were also briefly discussed.

The South Asia group identified a number of water-related diseases. It was noted that considerable variations existed in the incidence and disease burden between the three countries. The group further identified chemical contamination from agriculture and industries as a major threat to health, but it also pointed to the health effects of significant, naturally occurring contamination of ground water with arsenic and/or fluor. Among the health determinants listed by the group featured poor maintenance of irrigation systems, illegal irrigation, migration, construction of dams and environmental degradation. The notion that improved income from irrigated agriculture could lead to substance abuse (alcoholism and drug use) triggered a discussion on the boundaries of the scope of water-related health impacts. It was agreed that the phenomenon referred to was important, but not specific to water resources development.

The Eastern Mediterranean group I (Iran, Jordan, Syria) presented a country by country review.

For Jordan no specific health problems were observed related to water, except for the general shortage of water and some local problems. The degree of ground- and surface water pollution from agrochemicals was not precisely known. There were speculations that the contamination may be on the increase.

For Syria, health risks from agrochemical pollution of surface and groundwater had been established and isolated incidences of excessive nitrate in groundwater had been reported, leading to blue baby

syndrome. Another threat to health was the widespread use of untreated sewage water for irrigation. In some locations water with high mineral content is used with unknown long-term effects on health. For Iran, it was noted that the expansion in rural water supply had led to a significant decrease of water-borne diseases (see Iran presentation below). Irrigation and water supply also had the effect of increasing food safety and improving diets with positive effects on the health of the population. Absence of irrigation and safe water supply on the other hand continued to cause health problems in remote rural areas. Among the health determinants illegal settlements, lack of awareness and the role of women were noted.

The plenary discussions explored the health effects of the use of highly mineralised water (for example, high iron contents), but did not come to a conclusion. It also discussed the potential health effects of the nitrification of groundwater.

The Eastern Mediterranean group II (Morocco and Tunisia) established a list of water-associated health issues relevant in the two countries. They did not, however, relate each health issue to one or more specific water management issues. The health issues included malaria, schistosomiasis, cholera, helminth infections, typhoid, hepatitis, diarrhoea, pesticide poisoning and nitrate poisoning. It was noted that improved water supply would lead to advances in hygiene, nutrition and general well-being. Among the determinants of present situations of ill-health were mentioned: the lack or poor maintenance of irrigation canals, the lack of hygiene, water stagnation, insufficient knowledge and upstream erosion.

The plenary discussion highlighted the need for improved provisions of drinking water, in particular in the context of irrigation development and also as part of resettlement programmes. The absence of adequate water infrastructure in some countries (Afghanistan) or in isolated areas of other countries created serious health problems. On the other hand, considerable progress in the extension of drinking water supply had been observed over the past ten years.

The Eastern Mediterranean group III (Oman and Yemen) prepared the table at the top of the opposite page to reflect the key water-associated health issues and their determinants.

List of Health issues		
Health Issues	Environmental Determinants	Social Determinants
Truly Water-borne diseases Typhoid, shigellosis, cholera, Hepatitis A, Amoebiasis	Lack of safe water supply Lack of proper storage system Improper handling of water at the level of household Improper sanitation system	Socioeconomic status Low health awareness Behaviour
Water-related Diseases Malaria, WNV, Filariasis, Dengue	Improper irrigation Storage system Improper Sewerage	Improper housing Sleeping behaviour Social status
Water-based diseases Schistosomiasis, Drancunculiasis	Lack of safe water supply Lack of proper storage system Improper sanitation system	Social status
Water-washed Diseases Skin Diseases, Trachoma	Shortage of water supply	Crowding Hygiene behaviour

4. Review of the impact of irrigation development on community health

Four countries from the WHO Eastern Mediterranean Region presented information on water-associated health issues.

The **Islamic Republic of Iran** presented an impressive demonstration of the beneficial effects of providing safe water supply and adequate sanitation on the reduction of diarrhoea, cholera, typhoid and hepatitis. According to the data presented, currently 85% of the rural population had access to safe drinking water and 60% to adequate sanitation. The incidence of reported diarrhoea cases had decreased from some 2,000,000 in the early 1980s to some 114,000 by 2002. The incidence of malaria had been reduced by some 75% over the 1990s, but here it was more difficult to establish how much of this reduction could be attributed to modernisation in irrigation. More attention was required for the health aspects of waste water use in agriculture.

Schistosomiasis continued to be a disease of public health concern in **Morocco**. Successful case detection and treatment programmes in the 1980s and 1990s had reduced the prevalence of the infection to levels where further efforts to detect and treat cases had become economically unfeasible. The need had therefore arisen for innovative measures that reduce local transmission risks. The results of a 1996 study in the Tessaout Amont irrigation scheme were presented. This 53,000 hectare scheme was characterised by open lined canals and centralized water management. Based on detailed snail surveys throughout the scheme, three measures were selected for testing: intensified canal cleaning plus desiccation, the installation of iron covers on siphon boxes and a reduction of the diameter of siphons to obtain a stronger flushing effect. Of these three, covering the siphons proved to have a significant effect on snail populations and transmission risks: reduced algal growth in the darkened siphons failed to sustain a snail colony. It was therefore recommended to cover all siphons in the existing scheme, to redesign siphons so they are less attractive as snail habitats and to minimise the number of siphons in future irrigation schemes. The long term impact of the installation of iron covers was, however, put into question, as a later visit to the scheme revealed that the iron covers had gradually disappeared. It was stressed that co-ordination of drinking water supply and irrigation development remained a critical condition to keep schistosomiasis under control. In the meantime, the focus of schistosomiasis transmission in Morocco seemed to have shifted back to the traditional transmission sites in oases.

In **Oman** the picture presented with respect to malaria and its control bore resemblance to the case of schistosomiasis in Morocco: successful vector control and case detection/treatment activities resulted in a dramatic reduction in malaria incidence during the 1990s. Some pockets of transmission, nevertheless, remained. The Al-Batinah region (population 1994: 433,731) in the north of Oman was one such focus. Malaria transmission was linked to traditional irrigation of palms trees, fruits and vegetables, with some 10,000 tanks spread over the area. A 1994 initiative promoting “one dry day a week” to interrupt the mosquito vector breeding cycle had some impact, but it was difficult to sustain the participation of the farming communities. In 2001 a Royal Decree to replace traditional irrigation with drip irrigation marked a major change and an opportunity for a sustainable elimination of malaria from this region. The awareness and participation of the local population remained, however, critical. The shift to drip irrigation did not only result in an interruption of transmission, but also led to a reduction in pesticide use by 50% and a reduction of the numbers of temporary workers and, therefore, of the risk of re-introducing malaria.

Statistics from **Yemen** showed the difference that improved access to safe water supply can make with respect to child mortality. For example, an infant mortality rate of 85/1000 in settlements with piped drinking water compared to 105/1000 in one without. The same difference could be observed with respect to sanitation: in settlements without adequate sanitation the under-five mortality rate amounted to 146/1000, in those settlements with adequate sanitation it was 115/1000. Water supply and surface water management could also play a key role in reducing malaria (1.5-2 million cases

annually) and schistosomiasis (two million people infected). Providing the basic needs (safe water supply, proper disposal of excreta and wastewater, environmental sanitation and health education), together with good nutrition, will improve the health indicators by at least 50% without any other intervention.

In the concluding discussions the issue of resources for infrastructure and environmental management measures was raised. Generally the national health budgets were only 5% of the overall budget and thus insufficient to finance water supply schemes or irrigation modernisation. Co-operation of health professionals with water managers was considered essential, to ensure that in the decision-making on water supply and water management issues, health is taken into account effectively.

It was also observed that there were few trade-offs between water development and health except for isolated cases of traditional communities that could be affected in their life style. There was a general consensus that integration of health aspects into water development projects had to occur at an early stage, with a main focus on design options and alternatives whose additional cost would be off-set by multiple benefits in agricultural production, environment and health.

To address confusion over the different water uses and in particular the concept of drinking water supply as a basic need versus its role as a specific health intervention, Kazi Jalal and Gene Peralta prepared a diagram that served as a guidance in further discussions. It was recommended by the workshop that this diagram be included in the Guidelines on incorporating health in dialogues on water for food and the environment.

5. Review of the status and applicability of guidelines and manuals for health in the context of irrigation development

In a brief introductory presentation, Robert Bos highlighted issues related to guidelines and manuals to incorporate health into irrigation planning, development and operations. There were many guidelines on different aspects of public health, and many guidelines on water resources development and management, but relatively few combining the two issues. Guidelines addressing cross-sectoral and multi-disciplinary subject matter, more so than conventional sectoral guidelines, begged the questions: what is their purpose? Who are they intended for? And, at what level are they to be applied? Such guidelines could be directed to the policy or to the operational levels, they could be technical or managerial in nature, and they may be practical or normative and authoritative.

Examples of guidelines from the drinking water supply and sanitation sub-sector included:

- WHO Drinking Water Quality guidelines
- WHO guidelines for Operation and Maintenance of Water Supply and Sanitation Systems
- WHO guidelines for Community Assessment of Water Supply and Sanitation Needs (PHAST)

Other sectors included water supply and sanitation components in their guidelines, e.g. FAO in its guidelines for rural development and the World Bank and UNDP in their guidelines on financing water supply and sanitation programmes.

Among the existing guidelines of a cross-sectoral nature featured the WHO Manual on Environmental Management for Mosquito Control (which dates back to 1982) and the guidelines on health in waste water use for agriculture and aquaculture. In the series of guidelines produced by the joint WHO/FAO/UNEP Panel of Experts on Environmental Management for Vector Control (PEEM) the topics of institutional arrangements, impact assessment and cost-effectiveness analysis were addressed. Several organizations, including FAO and InWent had adopted sections of these guidelines into their own, sectoral guidance documents. More recently, WHO had published a training manual on Health Impact Assessment, and it had also provided an input into the chapter on best practice of the report of the World Commission on Dams.

A number of other guidelines were quoted whose link to water was less clear.

To assess the needs for guidelines and their use a number of questions needed to be asked:

- What are the needs if health is to be introduced in water resources development decision making and dialogues ?
- How should guidelines be made available/made more accessible ?
- What technical back-up is needed for countries to be able to use guidelines ?

In the ensuing plenary discussion, each country prepared its views on these questions and presented them for discussion. Following is a summary of the outcome:

Subject matter

A range of topics and areas was brought up, some of which were not strictly relevant in the context of water and health, and for some of which guidelines did exist, but had obviously not been publicised sufficiently. Guidelines topics that were relevant and stood out included: water management methods for vector control, health impact assessment of water resources development, promotion of strategy development, planning and institutional arrangements for health in water resources development, incorporation of health into dialogues on water for food and the environment (with a focus on the situation analysis phase) and implementation of international conventions on toxic substances. Of a managerial rather than technical nature were the following guidelines topics: health promotion in the context of wetlands conservation, introducing health in the university curricula of engineers and agricultural scientists, and community participation/public awareness raising.

Accessibility

There was a general consensus that this was an area with much room for improvement. The need to translate guidelines into local languages was frequently mentioned, as was the idea of adapting generic technical and managerial guidelines prepared by international agencies to more simplified versions for use at the local level to address local needs. Such simplifications would not only imply translating expert jargon into language that was easy to understand for non-experts, but also the generous use of visual aids (drawings, diagrams and the like).

The activities aimed to improve access to and local relevance of guidelines should be accompanied by concerted action to better publicise the availability of guidelines.

Target audience and level

Policy makers, programme managers and those who design university curricula were all mentioned as potential target audiences for the different guidelines, but the need to address policy makers with a higher priority was clearly stated by several participants. It was felt that this represented the most strategic way of achieving the goals of guidelines, i.e. adequate standards and norms and best practice and procedures. A distinct mention was made of the need to improve the legislative framework for health protection and promotion in water resources development, and it was felt that guidelines on how to achieve such improvements would be very useful. Targeting the right audience at the right level also dovetailed with the above-mentioned adaptation of generic, international guidelines for use at lower levels: for each such adaptation to a different level, the target audience needed to be defined.

Arrangements for effective implementation

There was a strong feeling in the group that guidelines production was seldom adequately followed up with a programme of active promotion through training workshops organised for the target audience, and technical co-operation in their implementation. In the case of health as a cross-cutting issue in water resources development, such a follow up required first of all an active capacity building effort for health sector staff, to make them full stakeholders in the process. All too often, the lack of health sector interest and involvement had been the bottleneck to effective intersectoral collaboration. Next, such capacity building efforts should be extended to the other, non-health sectors, and a process of

active interfacing between the different stakeholders should be set in motion. The creation of political will in support of this and other cross-sectoral issues was fundamental for guidelines to succeed, and it was also considered important to agree in advance on clear indicators for their evaluation. Some participants stressed the need to route guidelines of this kind through official government channels which would add acceptability and credibility.

Effective implementation of guidelines required serious commitment: For international standard setting guidelines this implied that the standards, or at least the procedure to arrive at certain standards, had to be included in national regulatory frameworks. For operational guidelines it was pointed out that nationally adopted guidelines of best practice should become an integral and mandatory part of contractual services. The sensitivities linked to this approach were recognised, as witnessed by the experiences of loan-conditionality of the World Bank and regional development banks. Nevertheless, and in view of the importance of human health in development, as confirmed by the World Summit on Sustainable Development, it was suggested that multilateral financing institutions should be approached on the issue of integration of health in investment projects in all sectors. This could best be done through the task managers in those institutions. The need for international organizations to facilitate the exchange of experiences with guidelines and norms between Member States was also raised. This could be an important mechanism for further improvement of guidelines through feedback and field testing. For guidelines aiming at the very local levels, ministries of education could play a crucial role in their distribution and promotion.

Essential characteristics

A number of key characteristics of good guidelines were proposed. They included the notion that guidelines should be evidence-based (this in turn raised the question of research needs in a number of areas) and that they should promote best practice. They should also adhere to the principle of subsidiarity, i.e. decision-making at the lowest possible administrative level. Many guidelines focused on technical issues without dealing adequately with the managerial implications of different technical options.

6. Mechanisms, institutional arrangements and incentives for the effective incorporation of health into the dialogue process

Under agenda item 7, Robert Bos gave a brief introduction on mechanisms and arrangements to promote health as a cross-cutting issue. Starting off with the definitions of health (WHO: *a complete state of physical, mental and social (and spiritual) well-being and not merely the absence of disease and infirmity*) and the concept of sectors, a number of essential characteristics of intersectoral mechanisms and arrangements were presented as follows :

- They need to overcome the obstacles of vested interests
- They need to provide tools to resolve potential and real conflicts
- Their combined output must be greater than the sum of the outputs of its individual sectoral partners
- There must be agreement on a number of principles, such as subsidiarity, transparency and accountability
- Integration must be a rational process with agreed decision making criteria and procedures
- Effective mechanisms should be custom-designed to meet needs at different levels
- They need to be solidly anchored in the overall governance structure

In order to achieve real change in policy frameworks to favour intersectoral collaboration and to be able to establish effective institutional arrangements between sectors, a first important step was to carry out a joint review of all sectoral policies to identify opportunities for harmonisation with respect

to health issues and to incorporate health issues into sectoral development policies wherever this would seem useful. In particular, policies supporting health impact assessment of development were of considerable interest in this connection.

Within a strengthened policy framework, the establishment of institutional arrangements could now be a next step. First, the potential of existing intersectoral arrangements should be explored. In most countries, national economic planning councils, environmental protection agencies and councils for science and technology existed. These were all entities that normally had links with all public sectors. Some of the health concerns related to development projects could perhaps be directed to and dealt with by these structures. Next, the need for the establishment of specific institutional arrangements on health issues in development could be addressed. Relevant links included those with the ministries of agriculture and environment, with academic institutions and, importantly, with the Ministry of Finance. Once partners had been identified and the content of the collaboration was agreed, it was time to put the intersectoral mechanisms in place. Experience had shown that the establishment of an intersectoral committee without an operational budget would seldom have a lasting impact. Intersectoral collaboration had been proven more effective on a per case basis in development projects, under a clear Memorandum of Understanding. For a more permanent arrangement, a clear link to existing intersectoral bodies, a clear mandate and the allocation of adequate resources had been shown to be essential elements.

Following this presentation, the participants worked in four groups to address three points: a situation analysis of institutional arrangements in the different countries, identification of obstacles to intersectoral collaboration and ideas to bridge the intersectoral gaps. The outcomes of the rapid situation analyses are presented below for groups of countries, followed by a summary of obstacles and ideas how to overcome them.

In **Morocco, Oman, Tunisia and Yemen** similar conditions existed with respect to available methods to promote intersectoral action; for example, EIA studies were performed in these countries, but they lacked a health component; guidelines for the preparation of EIA and HIA studies were urgently needed. There was no policy framework that promoted the intersectoral functions of the various ministries with respect to health. In Yemen, intersectoral mechanisms played a role in national support for fisheries, in a national funds for agricultural development and in a national funds for social development; in Oman the Ministry dealing with environment and water resources (MRMEWR) provided intersectoral links; in Tunisia, this role was played by the national Environmental Protection Agency, bringing together ministries of agriculture, environment and water resources; while in Morocco there was a national commission for EIA studies.

Afghanistan represented a special case, as its governing structure had been destroyed by 26 years of war, political instability and social disruption. The establishment of a legal framework that would favour intersectoral action was desirable, but the country first needed a Constitution. The other countries in this group (**India and Sri Lanka**) referred to the lack of a clear link between government structures and essential functions as a key obstacle to intersectoral action. The very nature of sectors, representing vested interests in society and competing for limited public resources, resulted in an sector-centric perspective and a lack of commitment to policies aimed at overcoming the obstacles. Two very clear-cut obstacles identified by these countries were the fact that resources were not specifically earmarked for intersectoral action and that few effective mechanisms for intersectoral collaboration existed.

The perspectives of **Indonesia, Philippines and Thailand** mirrored those presented above. It was observed that obstacles to intersectoral action existed at all stages: planning, implementation and evaluation. A lack of transparency and outright bias in sectoral procedures seriously hampered the bridging of intersectoral gaps.

The presentation of the **Islamic Republic of Iran, Jordan and Syria** re-iterated many of the above obstacles, but added the fragmentation and/or overlap of functions over a number of sectors, the lack

of harmonisation of regulations in different sectors and the restrictions on spending sectoral resources beyond sectoral core functions as important obstacles to intersectoral action.

A range of suggestions was made to overcome the various obstacles to intersectoral collaboration. The creation of incentives to promote intersectoral action were mentioned repeatedly, through financial allocations exclusively for intersectoral action, with clear criteria on what constituted and what did not constitute “intersectoral”. Such incentives could be combined with regulations that would provide instruments to enforce intersectoral action in certain situations. International financing institutions could also include intersectoral action as a conditionality whenever appropriate, and governments could install sanctions for lack of transparency and bias against intersectoral collaboration.

There were several options for creating an enabling environment for intersectoral action: harmonisation of sectoral policies, and of legislation, specific legislation on certain issues of an intersectoral nature such as impact assessment, and the structural development of sectors, with a clear description of functions and roles and indicators for when intersectoral action was needed. Decision making procedures in development planning could be made more explicitly intersectoral.

It was recognised that capacity building would be centre stage in efforts to promote intersectoral collaboration. Professionals in the various sectors needed training to develop their intersectoral negotiating skills, institutional arrangements needed to be put in place aimed at avoiding duplication of efforts by different sectors, and an accelerated introduction of electronic networks would allow an improved flow of information. The process of decentralisation, on-going in many countries, should ensure that the devolution of responsibility for operational decisions was matched by the devolution of decisions about the use of financial resources.

Finally, it was pointed out that in some settings a multi-stakeholder consultation on the nature and goals of health care systems could contribute to a higher level of intersectoral action for health.

7. Review of current and planned Dialogue activities and opportunities to incorporate human health as a cross-cutting issue.

Under agenda item 9, Domitille Vallée first gave an overview of the Dialogue portfolio.

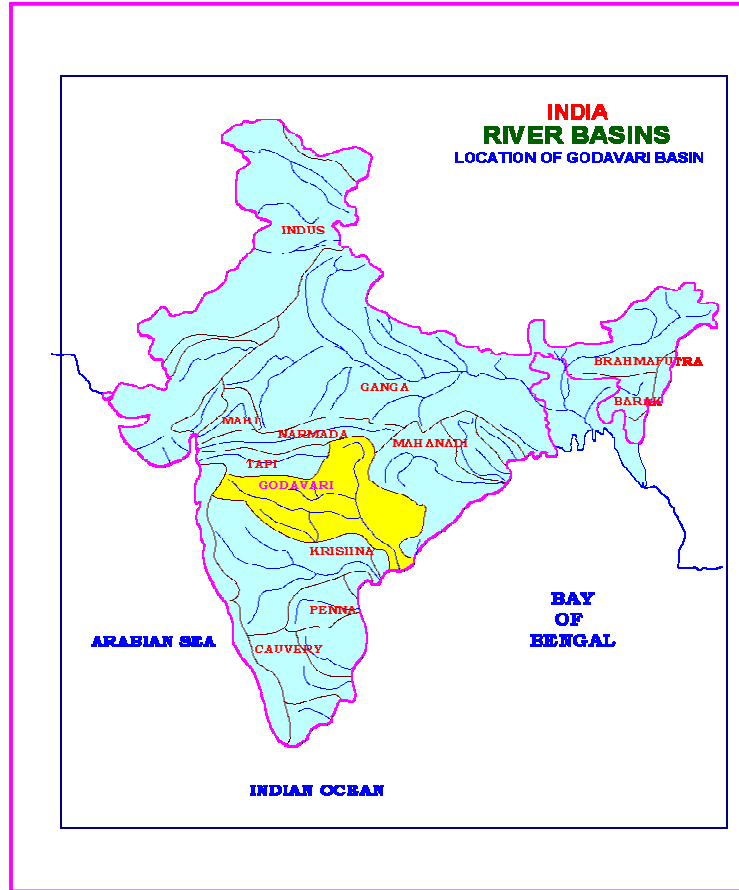
A copy of the portfolio is presented in Annex 4. Next, four countries presented their Dialogue project: India, Indonesia, Philippines and Sri Lanka. The Dialogue projects in Thailand and Tunisia were still in an early development stage.

The Godavari dialogue in **India**, was presented as a civil society initiative on the Godavari mid-river basin management. The Godavari is the second largest river in India, running from West to East over the Indian sub-continent and ending in a delta on the Bay of Bengal.

The Godavari has a total length of 1465 km, and its basin covers 312,812 km², of which 73201 km² falls within the State of Andhra Pradesh. The upper basin of the river comes under the administration of Maharashtra State, the lower basin, in Andhra Pradesh, is well developed and the focus is now on developing the mid-basin. The Government of Andhra Pradesh developed plans for a major lift irrigation scheme on Godavari powered by electricity generated from a hydropower station, involving considerable investments (>100 million dollars). Previous experience had shown that communities only come to know of such development plans once all details have been finalised. It is therefore important that civil society be engaged by the Government at an early stage of proposal formulation. Civil society involvement is seen by the Government as an opportunity to select best options rather than a threat to their ‘development’ proposals.

It was foreseen by civil society organizations that this project would have major and long term impacts on communities, sustainable development and water management.

The Government proposal ignored the experience of communities, emerging knowledge and options for new practices in river basin management. The Godavari mid-river basin was important for the development of the backward region of Telengana; the project, however, would benefit the more advanced region of coastal Andhra.



The objectives of the initiative included the facilitation of an open exchange of views between different interest groups and stake holders, both the powerful and the powerless, and the establishment of good processes and good science that is required for effective river basin management. Following a first technical consultation in April 2003, a Management Committee and an Advisory Committee were constituted, and a work plan was prepared.

The work plan consists of three phases: the first phase, research to develop a database on the Godavari, and listening to people - 'voices' - was launched with the Godavari *Pushkaralu*, a river-related religious celebration. The second phase would focus on 'forces', where different proposals and their basis will be considered. The final phase will bring out the 'choices' that reflect and represent the views and concerns of civil society. The entire process will conclude with a Citizen's Report in April 2004.

Implementation of the work plan entailed the organization of a large scale consultation with people (coinciding with the *Pushkaralu* in July 2003), the construction of a Godavari database and the launching of a Geographic Information System for mapping existing water sources and hydrological data from the entire basin area; topographic data sheets are also collected to estimate village level potential.

A survey during the multi-stakeholder consultation revealed the preferences of the community:

	Preferred project	Number	Percentage
1.	Projects with canal irrigation (with power generation)	914	45.0
2.	Lift irrigation scheme	513	25.3
3.	Improvement of existing projects/completion of pending projects	226	11.1
4.	Small projects (anicut, bridge-cum-dam; filling up tanks and ponds)	206	10.2
5.	Check dams on streams and flows	101	5.0
6.	No opinion	68	3.4
	Total	2028	100

Information provided by V.P. Sharma complemented the above from the health perspective.

Epidemiological data of malaria in East and West Godavari districts

District: East Godavari (Rice fields 455,300 hectare)

Year	Population '000	Malaria cases	Pf cases	Pv cases	Pf%	API
1990	3,482	7,102	6,371	731	89.71	2.04
1991	3,584	5,085	4,561	524	89.70	1.42
1992	3,584	3,993	3,570	423	89.41	1.11
1993	3,584	4,259	3,840	419	90.16	1.19
1994	3,683	6,883	6,242	641	90.69	1.89
1995	3,719	5,886	5,130	756	87.16	1.58

District: West Godavari (Rice fields 400,900 hectare)

Year	Population '000	Malaria cases	Pf cases	Pv cases	Pf%	API
1990	2,893	4,311	3,347	964	77.64	1.49
1991	2,903	2,196	1,751	445	79.64	0.76
1992	2,980	655	496	159	75.73	0.22
1993	3,022	312	185	127	59.29	0.10
1994	3,049	262	185	77	70.61	0.09
1995	3,108	246	169	77	68.70	0.08

Explanation: Pf = *Plasmodium falciparum*
Pv = *Plasmodium vivax*
API = Annual Parasite Index

The proposed dialogue in **Indonesia** aimed at conflict resolution at the policy level and had a focus on the mitigation of the impacts of floods and droughts, the promotion of best practice and the creation of awareness among all stakeholders. In order to achieve these objectives, activities had been designed in a number of phases: the Preparation Phase would see the establishment of small coordinating unit, the training of Dialogue Facilitators and the preparation of a proposal for background studies and a situation analysis for submission to donors, followed by their implementation. In the Implementation Phase dialogues would take place at national, provincial and river basin levels. The final phase, follow-up actions would cover the institutionalizing of dialogue results in the form regulations, policies and programmes, and the establishment of performance indicators and a monitoring process.

The expected outputs of this Dialogue activity would include an increased chance of success of food security programmes and achievements of the MDGs; a reduction of threats to water availability, water quality and water resources sustainability; the recovery of degraded watershed/river catchment areas, and, the sound management of floods and droughts.

In the ensuing discussion it was explained that people would be involved through NGOs and schools. The response so far had been slow but the pace was improving. It was important that alternatives to unsustainable behaviour were shown. Participation of people living upstream who have little incentives to change their behaviour was important but difficult to achieve. More political support and pressure through the enforcement of existing laws would be required.

The proposed Dialogue project from Davao, the capital of the island of Mindanao in the **Philippines** featured a classical conflict between various interest groups over water.

Banana and pineapple plantations in the region provide an export income to the city of around US \$50 M/mo. These plantations are run by four multinational companies employing around 30,000 farmers. They are located within the watershed that feeds the aquifer from where Davao City draws 97% of its water for domestic purposes.

The key conflict areas included the potential water supply contamination by fertilisers, pesticides and their residues; the potential for economic losses; and, environmental degradation – soil erosion, siltation of rivers, river pollution. A case can also be made for threatened food security since subsistence agriculture has been replaced by the two cash crops. Several studies were done including an IAEA hydrological isotope study.

The requirements to improve the situation implied a number of potential conflicts by themselves. These requirements included the need for an updated land use plan and the need for strict enforcement of regulations such as EIA. Changed land use patterns may result in the displacement of tenants and agricultural workers. They may also have health impacts due to pesticides such as skin diseases and lead to psychosocial disorders. With the recent adoption of safe water as a basic human right, there was also a human rights aspects to this case.

It was proposed that a multi-stakeholder dialogue, with international assistance, should explore alternatives such as agro-forestry, eco-tourism and organic farming. Proper siting of future expansions of the banana plantations e.g. outside the critical watersheds, should also be considered. An independent study should be done on the environmental pathways of pesticides in Davao watershed and studies were needed to arrive at a better delineation of specific groundwater recharge areas. A dialogue should also consider options for the strict enforcement of environmental legislation and regulations, and it should promote the review and updating of the existing land use patterns.

The proposed dialogue would, therefore, focus on raising awareness, developing environmentally friendly alternatives to mono-cropping with high agro-chemical inputs, land zoning and enforcement. The ensuing discussion revealed that technical solutions for the problem existed but that private interests, lack of political will, insufficient awareness and negligence were the main obstacles. Mobilization of the local population and international support would be required.

The Area Water Partnership in **Sri Lanka** had chosen the Malwathu Oya basin as the setting for a Dialogue activity. This water-stressed basin was entirely located in the northern dry zone of the island. It was characterised by poor water quality and there were a number of management issues related to the river system that called for a stakeholders dialogue.

The deterioration of water quality was due to several factors: indiscriminate waste disposal, the washing of hospital and prison linen, sewerage leakage, the disposal of paddy husks, the depletion of the ground water level, overexploitation of the main river and its tributaries, vegetation clearing of the upstream catchment, pollution by pilgrims to a local religious site, and water contamination by chemicals. There was also a lack of upstream-downstream coordination.

The pollution originated from the run-off from agricultural lands where pesticides and fertiliser were used. There was also a seasonal problem of malaria incidence due to mosquito breeding in rock pools in the riverbed.

Following the dialogue, some of the measures taken to improve the situation were of a regulatory nature. For example, the washing of hospital linen was now restricted, and the army and prison camps no longer discharged effluent directly into the river. The dialogue led, however, also to community mobilisation, including the cleaning of river banks by volunteers, a reduced dumping of city waste in the river, a tree planting campaign to reduce river bank erosion and the removal of obstructions in the river to enhance the flow and reduce mosquito vector breeding.

Responding to a question in the discussions it was clarified that this project had not followed the conventional dialogue approach and procedure. Rather, there had been a series of workshops, village meetings, presentations in schools etc. The process had started in 2001 and was now completed. The support of the provincial governor had been essential. The next step would be to transform the achievements into a long-term sustainable programme.

Next, participants worked in individual country groups to prepare concept notes, pre-proposals or protocols for either the incorporation of health into planned/on-going Dialogue activities (India, Indonesia, Philippines, Sri Lanka, Thailand, Tunisia) or as activities that support intersectoral action for health in water resources development projects (Afghanistan, Iran, Jordan, Morocco, Oman, Syria, Yemen). A summary of each of the outputs is presented below.

Afghanistan

The Afghan delegation prepared a concept note on a water management and health theme, with a budget. It focused on the district of Said Abad, located in the central part of Afghanistan, in the Wardak Province, with a population of around 60,000. The main source of water was surface water and important diseases included diarrhoea, typhoid, parasitic infections, measles and fungal infection. Women and children were the vulnerable groups at risk. The main crops included wheat, potatoes, apples, apricots, grapes, tomatoes, carrots and different kinds of vegetables. There was a varying degree of pesticide use on the various crops.

The key opportunities to improve community health status in this region included the provision of access to safe drinking water, adequate sanitation and safe food; environmental sanitation, improved water management for agricultural production, improved irrigation infrastructure and, to sustain the improvements, training of local staff.

With the goal of improving the health status through water management, environmental protection and food security, this activity would entail the further development of water resources, a reduction in the incidence and prevalence of water and sanitation associated diseases, and the improvement of food safety and quality.

India

The initial Dialogue situation analysis had been done but did not include a health component. Important health problems in the basin area included malaria, fluorosis, gastro-enteritis, dengue (incidence gradually increasing), Japanese encephalitis, skin disorders, filariasis, typhoid, hepatitis A and B. There were also adverse health effects of unsafe pesticide use (health status, vector resistance, food contamination).

The proposal foresaw the collection of secondary data on health issues with a special focus on the five districts in the mid-basin. Local, district and State level health officials would be invited to forthcoming stakeholder consultations.

The conduct of village studies would focus on the health implications of tanks, bore well irrigation and dry land cultivation; farmer to farmer dialogues would bring out the health implications of changing agricultural practices. The Dialogue media plan, aimed at awareness creation, would also include health issues.

All efforts in the project would aim at enhancing the positive aspects and mitigating the negative effects on health, in the framework of an overall more integrated approach to development.

Key to all this would be the process of learning and adapting:

- Positive and negative impact and the peoples voices in the project area should be communicated to the policy makers
- Positive and negative impacts on the health of men, women and children would receive focused attention and remedial measures to correct the negative impact would be taken up
- Best practices in support of health and environment would be learnt through networking
- The quality of life would be improved

Indonesia

Indonesia was in the middle of water resources policy reform. Basic principles of water resources management and development, institutional structures and system financing were being formulated and/or enhanced to serve as more effective platform for sustainable water governance. Inputs in relation to food security, environmental sustainability, poverty, health and gender would make valuable contributions to the formulation of these policies.

Key issues related to water, food and environment are (i) food security, (ii) threats on water availability and sustainability, (iii) watershed degradation, (iv) floods and droughts, and (v) health issues. Water pollution on river and other water bodies from agriculture, industry and urban as well as domestic wastes reached a level that caused a threat to human health. Watershed degradation resulted in severe floods in the rainy season and droughts during dry season that were both decreasing food production, interruption water supply due to decrease of water availability and poor water quality which eventually affect human health through diarrhoeal diseases, typhoid and vector borne diseases. Dialogues at the policy level would result in strategic solutions to potential conflicts.

The proposal envisaged a preparatory phase (at national level) that consisted of the following activities: establishment of a small coordinating unit, preparation of Dialogue proposal, training of the trainers, establishment of dialogue agenda, and preparation of dialogue materials such background study/situation analysis on such subjects as assessment of water demands for people, food, environment, health, and industry for various scenarios ("what if ?"scenario) up to 2025, and an assessment of impacts of water related disasters on human health.

Next would be an implementation phase (at national, provincial and river basin levels) with the following activities: a number of dialogues on Water, Food and Environment at provincial and river basin level where there are potential conflicts between water for food and the environment. The problems would include increasingly severe impacts of water related disasters. This would culminate in a Dialogue at the national level to draw up the recommendations for policies on water for food and environment. Among the venues for a dialogue on health and water management mention was made of the Menoreh Hills, Central Java, where the current malaria situation posed a threat to spill over to other areas. There were several options for alternative water management to deal with this problem.

Jordan and Syria

In both countries, governments had adopted water strategies and policies. The national policy pointed out that: water was a national resource, and that a comprehensive national data base had to be established for monitoring, data collection, data processing, updating and dissemination of

information. The water potential should be developed taking into account economic feasibility and social, environmental and health impacts. Wastewater should be treated to quality standards for agricultural and non-domestic purposes. Water resources planning followed a five year revolving cycle, with a priority to meeting basic human needs.

Government regulations prescribed the following objectives to be complied with in relation to health standards:

- Setting and enforcing national health standards, especially with respect to drinking water.
- Concerns for public health and the health of workers to be the focus of programmes of reuse of treated wastewater.
- Laboratories for control to be maintained and properly equipped.
- Research and field surveys to be conducted to identify the health impacts of wastewater use.

The proposal for both countries included enhancing water research for the improvement of water resources management, economics, environment, crops requirements and controlling evapotranspiration; and, strengthening the liaison with international institutions to keep up with modern technology.

It should also include a periodic review of institutional arrangements and legislation in effect and appraise their relevance to the *status quo* through changing conditions and times. Enhancement of stakeholder participation and cooperation among public and private sectors involved in water development and management would be important elements.

Morocco

Four government departments played a critical role in preventing and mitigating adverse health impacts of water resources development: the Department of Water (including six basin authorities), the Ministry of Agriculture, the Ministry of Environment and the Ministry of Health. The Moroccan proposal envisaged capacity building across these sectors in Health Impact Assessment. The national objectives to improve agricultural production and the availability of water included, per year: the construction of one dam and the addition of one million hectares of irrigated area. They also aimed to introduce new irrigation techniques to save water .

A number of health issues were identified in this connection: malaria; schistosomiasis; hepatitis; helminthiasis; diarrhoeal diseases; typhoid; pesticide poisoning; nitrate poisoning.

Some methods and procedures for EIA studies had been institutionalised in Morocco. The building of dams is subject to EIA studies under the responsibility of a National Committee; medium and small-scale projects were dealt with at the local level by Technical Committees. There was now a need to strengthen HIA studies through: training of health personnel involved in the EIA committees, training of personnel working for other stakeholders and the development of guidelines on HIA in local language

The proposals suggested various phases: selection of a pilot area (Basin); establishment of dialogues processes; establishment of a Steering Committee and Technical Committees; development of an action plan. This would be followed by a situation analysis; agreement on the objectives; implementation of the activities in the action plan and follow-up/evaluation of the activities. The project would be completed by a scaling up of successful activities.

Oman

The proposal addressed the need for Health Impact Assessment capacity building in the Sultanate of Oman. Over the past two years, the Royal Decree 10/82 had imposed the requirement that an Environmental Impact Statement (EIS) for development projects be submitted at the same time as the license application for a development project.

The EIS was reviewed by the MORMEWR and before any project could go ahead, a No Environmental Objection (NOE) decision must be issued by the Ministry within 60 days.

MORMEWR had issued an EIA guideline under the title of “Guidelines for obtaining Environmental Permits”. Within the EIA Guidelines, development projects in Oman had been classified into eight groups “according to the technical aspects of their contraction and operation phase”. The guidelines did not, however, stipulate the absolute need for an EIA.

Health was mentioned in the guideline with no guidance on the compliance criteria. Minister of Health appraisal and approval was not required for project approval and implementation. It was pointed out that the EIA process as currently established in the Sultanate of Oman left a gap in the effectiveness of appropriate Health Impact Assessment of projects. This in turn could lead to adverse health and social impacts of significant magnitude.

It was therefore proposed, for a two year period (January 2004-December 2005) that the following objectives in HIA capacity building be pursued: awareness raising among decision makers and planners at the central level, and skills development in HIA procedures of professionals in all relevant ministries. First, a four-day seminar in February 2004 should introduce MOH staff to the principles of HIA and this should be followed by the training of Public Health staff in the MOH as Master trainers (three day workshop April 2004). This should be completed by a three-week training course for middle level managers of different ministries by mid-October 2004, aimed at developing skills for intersectoral negotiation.

Philippines

The basin Dialogue proposal of the Philippines wished to start a multi-stakeholder debate over two possible scenarios: the continuation of the plantations in the watershed, but under conditions of limited land use, more environmentally friendly cropping practices and an enhanced level of sustainability, or the elimination of these plantations and their start-up elsewhere in less sensitive areas. The first scenario had important environmental and health advantages, but would have an impact on the local economy including unemployment. The second scenario had the reverse implications.

The dialogue process would be supported by a rating of perceptions concerning the alternatives, and it was felt that the outcome was not necessarily and either/or situation: an increased enforcement of regulations concerning land use and agricultural practices and continued farmer education on alternatives to plantation cropping could lead to a viable new situation with less risks to environment and health. A detailed two-phased process over an 18-month period was proposed to achieve a successful dialogue that would bring all stakeholders together.

Sri Lanka

The first phase of the dialogue in the Malwathu Oya basin had been completed: the situation analysis had been carried out, dialogues held and measures implemented. In the next phase, it was proposed that several issues not yet addressed be covered: introduction of rain water harvesting tanks to deal with the high fluoride content in ground water, a further environmental management approach to deal with the rock pools that serve as breeding places for malaria vectors, and a continued monitoring of the health status of local communities. There would also be efforts to consolidate the achieved outcomes. In parallel, there would be efforts to extend the experience and results of this first dialogue to other river basins in Sri Lanka: Maha Oya, Menik Ganga and perhaps Yan Oya.

Thailand

The proposal from Thailand fitted in with the Dialogue activity in the 18,500 km² Bang Pakong River Basin where land use included seasonal rice, rubber plantations and mixed orchards. This dialogue aimed to use the consultation platform, to solve problems addressing issues of concern of the basin and to promote networking to share experiences. Among the problems featured water allocation to different activities, water shortage in the dry season, the use of fertilisers and pesticides and pollution by sewage from pig farms.

In the preliminary work towards this dialogue, 32 stakeholders had been identified on the basis of their already active support of an environmental work in their communities or because they got involved in some kind of networking in different areas. They included informal community leaders, members of local government and members of the River Basin Committee.

The dialogue started in May 2003 with the introduction of the project to relevant government agencies. A forum was established to acknowledge the project and share viewpoints between stakeholders. Also, a meeting was held by Department of Water Resources in order for participating stakeholders to identify problems. The obstacles and difficulties they identified included: conflict of interest among stakeholders, poor communication and information dissemination within the group, the lack of well-trained facilitators and insufficient commitment and co-ordination from concerned government agencies

Health issues of importance in this project included those related to physical health: infectious diseases from contaminated water, diseases from exposure to chemical fertilisers and pesticides - such as skin disease, respiratory track inflammation, cancer -, those related to social health: conflicts within the community ; and those related to mental health: stress.

Tunisia

The wetlands management plans of the oriental lagoons (Korba lagoon) in the north-eastern part of Tunisia would provide the context for this Dialogue project. There were a number of problems that would require an environmental management approach, based on multi-stakeholder dialogue. These included :

- Impact of the local population and non residents during the summer (local population crossing the wetland, solid waste generated by non residents)
- Industrial effluents (from four manufactures of tomato paste) discharged in to the wetlands (9000m³/day during 3 months)
- Discharge of wastewater (5,000 m³/day) into the wetland (no discharges since 2001, however, sludge of the discharges in the past remained a problem)
- Discharge of wastewater from slaughter houses (currently stopped)
- Intrusion of surface water from Sidi Othman river during storms
- Intrusion of sea water (small quantities) from small channels connecting the wetlands and the sea.

While there will be a number of technical solutions (construction of a fence around the wetland; discharge of 4000 m³/day of treated wastewater in the wetland, from a newly constructed treatment plant; construction of weirs under the roads to facilitate water flow between the three parts of the wetland (now separated by small roads). For the dialogue part of the project, a meeting of was foreseen to sensitise them to the existing problems that should be solved to protect the wetland/lagoon and human health. To start the process of dialogue in presence of ALL stakeholders a one day workshop was scheduled for 22 December 2003 to present and discuss the problems and the suggested solutions. This should result in a detailed work plan, with distinct monitoring and evaluation components.

Yemen

The goal of the proposal prepared by the Yemeni delegation was to support the Ministry of Health in its efforts perform essential functions for Health Impact Assessment. Technical assistance would be needed to:

- Review and revise the relevant legislation.
- Identify the gaps
- Adapt WHO/ FAO guidelines to local needs and conditions.
- Develop HIA Term of Reference.
- Prepare an intersectoral action plan of health.

Three types of capacity building were needed:

Training for Health Sector professionals at central level on the concept, principles and practice of HIA, duration: four days. Training for mid-level managers from different ministries to participate in an intersectoral actions to support HIA; duration: three weeks. And, a high- level HIA policy Seminar to review the sectoral development policies and to secure political support for policy reform processes; duration: four days.

This should be followed by training for health sector personnel at provincial and district levels to be able to carry out essential HIA functions. The project would also foresee some HIAs of few development projects to be carried out and well documented so they can be used for advocacy.

Conclusions and recommendations

At the end of the workshop, a number of conclusions and recommendations were formulated and subsequently approved by the participants

1. The workshop reviewed the health issues associated with water and water resources development in a comprehensive way. They recognised the extended range of water and health issues, the complexities of the links between water and health and the diversity of important issues in different settings. In addition to the traditional water-associated diseases, other health issues covered included the impact of pesticides and pesticide residues in drinking water, exposure to chemicals used in intensified irrigated agriculture, the psycho-social disorders related to displacement and resettlements caused by dam projects, the important links between water quality and food safety, and the impacts of water-related natural disasters, in particular floods and droughts, on health, which included drowning.

The workshop recommends that the incorporation of health into dialogues on water for food and the environment should always start with a proper screening and scoping exercise to determine the key health issues and to define the boundaries within which they are considered. It also recommends that the diagram developed during the workshop be the basis for the development of a Dialogue guidance document on the process of including health in dialogues. This guidance document should consider health issues in a broad and comprehensive way and it should be made available to all who plan to start Dialogue activities.

2. The workshop also reviewed the availability and coverage of guidelines on issues relevant to health as a cross-cutting issue in development, i.e. health in an intersectoral context. It identified a number of gaps, and it also identified a number of existing guidelines that need updating.

The workshop recommends that, in addition to the guidance document mentioned under item 1, guidelines be developed addressing the following subjects:

- *Guidelines for intersectoral action at different administrative levels*
- *Guidelines for Integrated Vector management (linked to Integrated Pest Management)*
- *A toolbox for environmental management for health*
- *Guidelines for the mainstreaming of Health Impact Assessment and that the existing PEEM guidelines be reviewed for updating.*

3. Some of the constraints recognised by the workshop with respect to the insufficient use of existing guidelines include their overall generality which requires further adaptation to render them useful at the country or local level, the fact that they are seldom available in local languages and the deficiencies in necessary follow-up by international organisations to support the necessary capacity building that will facilitate the use of guidelines.

The workshop recommends that the international agencies responsible for guidelines production take the necessary action to overcome the above limitations and ensure that guidelines are used to their full potential.

4. The workshop recognised that obstacles to intersectoral collaboration continue to hamper the effective consideration of health in the planning of water resources development. The nature of these obstacles at the different levels require detailed analysis at all levels to design mechanisms that can sustainably overcome them.

The workshop recommends that the Dialogue process be applied to assist Ministries of Agriculture, Health, Water and Environment to become actively involved in integrated water resources development at national, river basin and local levels. It also recommended that policy frameworks conducive to intersectoral collaboration be established. At the international level the relevant UN agencies should continue and strengthen their collaboration in this field, even at times of budgetary constraints. Particular attention should be given to the opportunities for collaboration between the WHO and the Regional Development Banks, with a view to including health in infrastructure projects for which the banks extend loans to their client countries.

5. Participants of the workshop prepared concept notes, protocols and proposals for activities in their individual countries, related either to dialogues or to health in water resources development, and they jointly reviewed these products.

The workshop requests the Secretariat of the Dialogue and the Water, Sanitation and Health Programme of WHO to work jointly with the countries on the further development of these products into viable proposals and to assist in the mobilisation of resources to implement them. The workshop also recommends that for a number of other dialogues not represented at the workshop, notably those in the Mekong countries, in southern and East Africa and in Central America, efforts be made to ensure the incorporation of health.

6. Information synthesis and dissemination of successful experiences, as well as failures, in setting up dialogues and in including health into them were considered essential by the workshop to achieve the goals set by the Dialogue. It felt there was still room for improvement in this area as far as the Dialogue project was concerned.

The workshop recommends that efforts be stepped up to deal with specific issues on the Dialogue/health agenda in an integrative and all-inclusive way. The experience of working with health as a cross-cutting issue should also be extrapolated to other cross-cutting issues such as poverty alleviation and gender.

7. Health Impact Assessment was recognised by the workshop as a framework that would provide support to intersectoral action for health in water resources development (and all other development for that matter). The workshop took note of WHO's efforts to harmonise Impact Assessment policies and mainstream HIA in the process of development planning.

The workshop recommends that WHO, through its Centre for Environmental Health Activities for the Eastern Mediterranean Region, develop a regional HIA capacity building programme based on the training material and guidance prepared and tested by WHO's Water, Sanitation and Health programme. It also recommends that the publication of EMR guidelines for Environmental Health Impact Assessment be expedited.

8. Finally, the workshop requests the Secretariat to complete a report of the workshop and a CD ROM with all presentations for distribution by the end of January, for distribution to all participants, to all interested parties and ministries in the countries represented and to the offices of WHO, FAO and UNDP in those countries.

ANNEX 1
INTERNATIONAL WORKSHOP

**HEALTH AS A CROSS-CUTTING ISSUE IN DIALOGUES
ON WATER FOR FOOD AND THE ENVIRONMENT**

HOLIDAY INN HOTEL
AMMAN, JORDAN
15-18 DECEMBER 2003

LIST OF PARTICIPANTS

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Ms Domitille Vallée, Co-ordinator, Dialogue Secretariat, International Water Management Institute, Colombo, Sri Lanka (*co-facilitator*)

Dr Hans Wolter, Water Management Consultant, Hofheim, Germany (*rapporteur*)

Unable to attend

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ANNEX 2
INTERNATIONAL WORKSHOP

**HEALTH AS A CROSS-CUTTING ISSUE IN DIALOGUES
ON WATER FOR FOOD AND THE ENVIRONMENT**

HOLIDAY INN HOTEL
AMMAN, JORDAN
15-18 DECEMBER 2003

AGENDA

1. Opening of the workshop, introduction of participants
2. Objectives and expected outputs of the workshop
3. Approval of the proposed agenda, tentative programme of work and workshop arrangements
4. Introduction to the Dialogue and status report on on-going activities
5. Review of key health issues in the Dialogue context
6. Critical assessment of opportunities to include health in individual Dialogue projects
7. Merits and limitations of mechanisms, arrangements, indicators for health in dialogues
8. Options for cross-cutting issues in dialogues: experience from the field
9. Review of on-going Dialogue projects and formulation of health components
10. Review of health aspects in irrigation schemes of the region
11. Recommendations
12. Closure of the workshop

ANNEX 3

INTERNATIONAL WORKSHOP

**HEALTH AS A CROSS-CUTTING ISSUE IN DIALOGUES
ON WATER FOR FOOD AND THE ENVIRONMENT**

HOLIDAY INN HOTEL
AMMAN, JORDAN
15-18 DECEMBER 2003

PROGRAMME OF WORK

Monday 15 December 2003

09:00 Opening of the workshop

Objectives and expected outputs
Robert Bos, Water, Sanitation and Health, WHO, Geneva

Introduction of participants

09:30 Introduction of the Dialogue
Domitille Vallée, Dialogue Secretariat

09:50 Question and answer session

10:00 Refreshment break

10:20 Rapid review of projects and of key health issues in the context of the Dialogue
Robert Bos, Water, Sanitation and Health, WHO, Geneva

10:40 Question and answer session

10:50 Group work session
Objective 1: to review critical health issues in the context of dialogues on water for food and the environment

Participants will go through a rapid scoping exercise to identify critical health issues linked to water resource development for irrigated agriculture and to the conservation of aquatic ecosystems; they will also analyse the environmental and social determinants of the health issues identified

They will work in five groups: South East Asia (Indonesia, Philippines, Thailand); South Asia (Afghanistan, India, Sri Lanka); and three groups of Eastern Mediterranean countries (Iran, Jordan, Morocco, Oman, Syria, Tunisia and Yemen)

Expected outputs:
Lists of relevant health issues in the context of dialogues WFE in different parts of the world, with their key environmental and social determinants

12:15 Lunch

13:45 Plenary session
Groups report back to the plenary with 10 minute presentations followed by discussions

- 14:45 Plenary session
Objective 2: to review the impact of irrigation development on health in communities and to discuss the applicability of guidelines/recommendations in the context of irrigation schemes in the Eastern Mediterranean and South/Southeast Asian regions
- presentations from (1) Islamic Republic of Iran
(2) Morocco
(3) Oman
(4) Yemen
- Overview of relevant guidelines and manuals available
- Plenary discussions on guidelines requirements
- Expected outputs:
Conclusions and recommendations on the need for guidelines development and their contents/scope
- 17:00 Closure of the session

Tuesday 16 December 2003

- 08:30 Recapitulation of yesterday's discussions
- 08:50 Plenary session
Objective 3: to design mechanisms, institutional arrangements and incentives for the effective incorporation of health into the dialogue process, together with indicators of success
- Presentations on
- Introduction on mechanisms and arrangements to promote cross-cutting issues
Robert Bos, Water, Sanitation and Health, WHO, Geneva
- 10:00 Refreshments
- 10:20 Group work session
- Three working groups will carry out a reality check on mechanisms and arrangements that will support the incorporation of health into the dialogue process, and essential requirements to ensure an effective incorporation.
- Expected output: an inventory of mechanisms and arrangements with a proven role in introducing cross-cutting issues in dialogues, and a list of knowledge gaps and research needs.
- 12:15 Lunch
- 13:45 Plenary session
Group reports on mechanisms, arrangements, incentives and obstacles gaps for cross-cutting Issues
- 14:45 Plenary session
Objective 4: to review current and planned Dialogue activities and make recommendations on the incorporation of human health as a cross-cutting issue
Introduction of the dialogue activities selected from the Dialogue portfolio for the incorporation of cross-cutting issues
Domitille Vallée, Dialogue Secretariat

- 15:15 Refreshments
- 15:45 Guidance on group work for protocol development
- 16:15 Group work session
formulation of protocols for a health component in selected Dialogue activities

Wednesday 17 December 2003

- 08:30 Recapitulation of yesterday's discussions
- 08:50 Group work session (continued)
- Objective 4: to review current and planned Dialogue activities and make recommendations on the incorporation of human health as a cross-cutting issue
- formulation of protocols for a health component in selected Dialogue activities
- (Refreshments at 10:15)
- 12:00 Lunch
- 13:30 Group work session (continued)
- Objective 4: to review current and planned Dialogue activities and make recommendations on the incorporation of human health as a cross-cutting issue
- formulation of protocols for a health component in selected Dialogue activities
- (Refreshments at 15:15)
- 17:00 Closure of the session

Thursday 18 December 2003

- 08:30 Plenary session
- Objective 4: to review current and planned Dialogue activities and make recommendations on the incorporation of human health as a cross-cutting issue
- Presentation of protocols
- 10:15 Refreshments
- 10:30 Plenary session
- Objective 4: to review current and planned Dialogue activities and make recommendations on the incorporation of human health as a cross-cutting issue
- Presentation of protocols
- 12:30 Lunch
- 14:00 Plenary session

Objective 5: to define the expected outcome on human health of the Dialogue product to be prepared by 2006

Expected outcome of the Dialogue initiative in 2006
Domitille Vallée, Dialogue Secretariat

Open discussions on the nature of the health component and of the other cross-cutting issues in the expected final outcome.

Resource mobilisation strategy for the health components developed

15:30 Closure of the workshop

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ANNEX 4

INTERNATIONAL WORKSHOP

**HEALTH AS A CROSS-CUTTING ISSUE IN DIALOGUES
ON WATER FOR FOOD AND THE ENVIRONMENT**

HOLIDAY INN HOTEL
AMMAN, JORDAN
15-18 DECEMBER 2003

DIALOGUE PORTFOLIO

Dialogue Portfolio of activities
Table 1: Dialogue initiatives contributing to the knowledge base²

Projects	Objective	Content	Some results	For more information
1. Comprehensive Assessment of water management in agriculture (CA lead by IWMI)	Strengthen the knowledge base on water-agriculture-environment and promote its use in developing consensus on investment strategies	Water/food/environment 22 research projects at global, regional, national and local level and a global assessment around 10 core questions on water management in agriculture.	Ongoing (2001-2004) -Policy brief and publ. on "water productivity in agriculture". -2 publ. on issues in agriculture water management. -Working paper on environmental flow assessment -database on environmental flow methodology	MOLDEN, David d.molden@cgiar.org http://www.iwmi.cgiar.org/assessment/index.asp http://www.lk.iwmi.org/ehdb/EFM/visitors/ViewAllMethodology.asp
2. Water and nature initiative (lead by IUCN)	Mainstreaming of an ecosystem approach into catchment policies, planning and management	Water/nature/ecosystem 8 projects at global and basin levels to support DWFE in a larger portfolio	On-going (2001-2006) Publ. on "Environmental flow, the essentials" CD ROM watershed of the world (IUCN, Ramsar, WRI, IWMI).	BERGKAMP Ger [GJB@hq.iucn.org] http://iucn.org/themes/wani/flowlaunch.html elroy.bos@iucn.org http://www.waterandnature.org/atl/atl/
3. Addressing Water-Related Environmental Footprints in Agriculture for the next 30 years (UNEP, FAO)	Assessment of environmental impacts of the expected development of agriculture in 2015/2030	Water/food/environment Project at the global level with pilot test areas around the world.	Starting (2003-2004) First methodological workshop (14-17) December 2003.	ADRIAANSE, Martin m.adriaanse@unep.nl KOO, Sasha sasha.koo@fao.org

² This includes only the on-going projects funded by the various bilateral and multilateral external support agencies. There are a number of interesting projects waiting for funding. Some projects are included under the basin dialogues as focused on a limited number of 'basin based' activities.

Report of a WHO/InWent workshop

4. Small holder system innovations in integrated watershed management (8 research institutions lead IHE-Delft)	Advancing knowledge on how to balance water for food and nature with a particular focus on upgrading smallholder rain-fed agriculture in water scarce landscapes.	Water/food/agriculture 6 research projects in southern Africa with two pilot areas : Thukula basin in South Africa and Pangani basin in Tanzania.	Starting (2003-2008) First inception workshop 19-23 May 2003.	ROCKSTROM, Johan rockstrom@eng.uz.ac.zw
5. Country policy support programme on the future role of water management in food production and sustainable rural development (lead ICID)	Improvement of country policies through modelling and scenario building at the basin level	Water/food/agriculture improvement and enhanced interaction between PODIUM and IMPACT Models and test in 2 basins in India and 2 basins in China	Ongoing (2002-2004) PODIUM model enhanced and adapted to the basin in India and China. Workshop dialogue with decision makers to be organised with IWMI, DWFE sec, IFPRI in January 2004 (tentatively)	Dr. Thatte ICID [icid@icid.org] http://www.icid.org/
6. River basin management: a negotiated approach (lead Both ends/Gomukh)	Present innovative approaches to river basin management to policy and decision makers; 6 local case studies	Water/food/environment 6 cases studies by local groups (Peru, South Africa, India, Bolivia, Cambodia-Viet Nam, Bangladesh)	On-going (2001-2004) Steering Committee, June 2003 (presentation of first findings)	HIRSCH, Danielle Water@bothends.org http://www.bothends.org/
7. Virtual water trade and geopolitics (lead by WWC)	Create a better understanding of virtual water, virtual water trade and to share views and ideas on the application and consequences of the concept.	Water/food/agriculture stimulating and implementing research on the natural, social, environmental, economic and political implications of using 'virtual water' trade as a strategic instrument in water policy.	On-going (2002-2005) Report from Unesco-IHE e-conference on virtual water and geopolitics (August-November 2003)	van HOFWEGEN, Paul p.vanhofwegen@worldwatercouncil.org http://www.worldwatercouncil.org/virtual_water/index.shtml

Table 2: National and Basin Dialogue initiatives
National Dialogues³

Projects	Objective	Content	Some results	For more information
Europe				
Dialogue in 10 countries of Central Europe –Bulgaria, Czech Rep., Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia- (lead by eastern Europe partnership CEETAC/GWP)	To help modernise agriculture and establish in an environmentally friendly way in the framework for implementation of the European water framework directive	Series of consultations around core issues at country level and regional level	Report presented at Kyoto World Water Forum, March 2003. Preparatory works on learning processes from Dialogue activities.	ljas.istvan@axeler.hu janusz.kindler@is.pw.edu.pl
Asia				
Malaysia national dialogue on WFE (lead by MANCID) Also dialogues in 5 basins	To establish, facilitate and promote an effective dialogue process at the national/sector/basin level by incorporating the entire spectrum of stakeholders. To promote better irrigation and drainage	Series of consultations at basin level around basin issues, at national level around sectors and a final national consultation. Activity backed with in-depth assessment of basin situations.	Series of workshop reports; presentation at Hanoi, 2002 and Kyoto 2003. Final report in preparation.	SHAHRIZAILA bin ABDULLAH, Tan Sri, Chair of MANCID shahsham@tm.net.my
Indonesia National dialogue on WFE (lead by Indonesia national water partnership/GWP)	Understanding concepts and processes, conceptual plan for a dialogue on WFE; establishment of small co-ordinating unit; and training of trainers	Build capacity to prepare a dialogue process on policy issues in Indonesia	Starting in 2003. Training on facilitation and multi-stakeholder processes planned in December (tentative)	SUTARDI Sutardi s_sutardi@hotmail.com
India – dialogue on the linking of rivers (lead by WWF and INPIM)	Facilitate wise decision-making and avoid social tension.	Suggested process includes setting up an independent commission, technical panels and conduct public hearings to evaluate the merits of the project and explore alternative options.	Initial consultation on the 8 February 2003	GUJJA, Biksham BGujja@wwfint.org www.riverlinkdialogue.org
America				
Dialogue debates in 3 Latin American countries -Peru, Chile, Uruguay (lead by Latin American water partnership)	To debate WFE issues at a national level and their relevance for the dialogue on governance.	Workshop events (2002) to contribute to the regional dialogue on governance	Spanish language Internet discussion on making water governance effective. No national reports on WFE reports yet.	http://www.eciac.org/dmi/proyectos/samtac/samtac.htm

³ This includes only the ongoing projects supported by various bilateral and multilateral donors. These projects consider all stakeholders and should investigate the better integration of local action experiences in the process. In addition, there are a number of interesting projects either developing or waiting for support. These include- Philippines water policy Dialogue; Water quality Dialogue in Bangladesh; National dialogue on water for food and environmental security in Mekong Basin (Lao, Cambodia, Thailand, Vietnam) by IUCN.

Basin Dialogues⁴

Projects	Objective	Content	Some results	For more information
Europe				
Germany/Poland – Dialogue on Oder basin and coastal area - phase 1 (lead by RWMB with UNEP)	Contribute to integrated water management of the Oder River and Coastal Area by stakeholders debate.	Consultation and consensus building with the stakeholders and the society.	Started 2003 with an inception workshop	ADRIAANSE, Martin m.adriaanse@unep.nl
Asia				
India- Godavari basin dialogue (lead by WWF)	To explore options and establish consensus on food security, environmental sustainability and water sector development.	Initiate and evaluate an effective civil society consultative process, build knowledge base, develop a learning agenda, develop approach	Ongoing (2002-2005) preliminary workshop in Hyderabad 4-5 April 2003 technical workshop on water management issues, 10-11 June 2003	GUJJA, Biksham BGujja@wwfint.org
Sri Lanka- dialogues in 4 basins (Mahaweli, Malwathu Oya, Maha Oya, Menic ganga) Lead by Lanka Jalani/GWP	Establish dialogues on issues confronting inhabitants of selected river basins	Background analysis of basin issues Basin consultations Program of action per basins	Ongoing (2002-2003) Draft report on outcomes of basin dialogues Proposal for national dialogue	Nanda Abeywickrama n.abeywickrama@cgjar.org
Nepal- Water Food and Environment management in East Rapti River Basin (ERRB) lead by IWMI-Nepal	To facilitate interaction between concerned stakeholders at national and Basin levels to understand, analyse and discuss gaps in water resources management for agriculture and environment in the ERRB	Identification of issues; addressing core issues through consultation process at local and basin level Up scaling by bringing up results to national level	Ongoing (2003-2004) Diagnostic report Preliminary workshop	PANT, Dhuruba d.pant@cgjar.org
Thailand-Dialogue for integrated management of the Bang Pakong River basin-phase 1. (led by Thai MNRE with FAO & UNEP)	To implement the national policy for decentralised water management by developing a facilitated process of social learning for multi-stakeholder management of water resources.	New ways to solve water problems and conflicts at the level of the Bang Pakong River Basin and Coastal Zone will be explored and an action plan will be established	Ongoing (2003...) Inception workshop (June 2003) followed by a series of stakeholder consultations during the summer.	AEKARAJ, Sukontha (MNRE) saekaraj@hotmail.com ADRIAANSE, Martin m.adriaanse@unep.nl KOO, Sasha sasha.koo@fao.org
Thailand_ Songkhram river (part of a regional project on the lower Mekong lead by WANI/IUCN)	To integrate the conservation of ecosystems and biodiversity into the management of the Mekong river, to ensure the livelihoods of indigenous people like Mong	Biodiversity and environmental flow assessment to guide decision making debates	Ongoing (2001-2005) Fisheries assessment ongoing	FRIEDRICHS, Hans IUCN-Asia hans@iucnt.org

⁴ This includes only the ongoing projects funded by various bilateral and multilateral donors. These projects consider all stakeholders and should investigate the better integration of local action experiences in the process. In addition, there are a number of interesting projects either developing or waiting for funds. These include- Lerma Chapala basin (Mexico); Guarani basin (Argentina/Brazil); São Francisco basin (Brazil); Regional Dialogue on WFE (Central America); Jholapuri basin (India); Local dialogues on WFE in Lao, Cambodia, Thailand, Vietnam (IUCN); Komadugu Yobe basin (Nigeria). In addition, There are some activities of FAO in Nepal, Cambodia and Burkina Faso and some activities under IUCN's Water and Nature initiative, which though developed by Dialogue partners but will contribute to the DWFE KB.

Projects	Objective	Content	Some results	For more information
Vietnam: Perfume river from disaster relief to integrated management (part of the water and Nature initiative, IUCN)	Improved flood management and sustainable resource use within the Perfume River Basin based on restored ecological services and an integrated water and land management.	Integrated management plan and pilot activities on the ground.	Ongoing (2001-2005) Workshop on environmental flow assessment (09/2003)	BOS, Elroy elroy.bos@iucn.org
America				
El Salvador- Basin El Imposible/Barra de Santiago (part of the water and Nature initiative, IUCN)	To improve the management of water resources and the quality of life in the basin	Dialogue platform to analyse the different problems related to water resources and define joint actions	Local communities and governmental agencies have since one year discussed the problems in the basin in a Stakeholder Forum, the "Mesa del Diálogo"	CALVO, Marco marco.calvo@iucn.org IUCN Regional Office for Mesoamerica
Honduras- Diagnostic for Dialogue in the Choluteca basin (lead GWP/CATAC)	To produce a diagnostic of the situation of the Choluteca basin and a project proposal directed to the management of water for agriculture and the ecosystems	Background analysis for basin diagnosis Consultation with key stakeholders Workshop to agree on proposal	Ongoing (2003-...) First phase : preparation of full dialogue proposal based on diagnosis Basin consultations (April 2003)	BALLESTERO, Maureen tempis@sol.ra.csa.co.cr
Africa				
Zambia - Dialogue in the Kafue basin (lead WWF with FAO) - Contribution of local action groups to the dialogue in Kafue plains(lead by AREZ)	Dialogue process for preparing an active and participatory management of water resources.	Establishment of a Dialogue process, information, stakeholder platforms National policy formulation stimulated by FAO	Ongoing (2002-2004) Brief on the project Inception meeting, May 2003	GUJJA, Biksham BGujja@wwfint.org KOO, Sasha sasha.koo@fao.org For AREZ contribution advocacy@zamtel.zm
Tanzania-Pangani basin (lead by IUCN) (part of the water and Nature initiative, IUCN)	To promote a process for integrated river basin management	Work on equitable water allocations for human and environmental needs	Ongoing (2002-2004) Stakeholder meeting in Moshi, Tanzania from 8 - 10 May (mandate). Training course in flow assessments from 15-18 September in Mbeya, Tanzania	IUCN East Africa Regional Office
South Africa- Pongolo floodplain system assessment-start-up	To promote floodplain agriculture into a diverse rural economy by enhancing co-operative management	Research to assess ways to balance irrigation development with conservation of ecosystems ; identification of scope and approach for dialogue process	Ongoing (2002-2003) Report in preparation	JAGANYI, Joan Jaganyijn@nu.ac.za
Burkina Faso – pilot dialogues on water, food, environment in the Volta basin (FNPP program managed by FAO)	Information to be provided by FAO	Information to be provided by FAO	Information to be provided by FAO	TORREKENS, Peter Peter.Torrekens@fao.org

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Projects	Objective	Content	Some results	For more information
Morocco- Souss-Massa Integrated Water Management (SIWM) (funded by USAID and relevant for DWFE)	To establish a River Basin Agency (RBA) that supports decentralization, economic development, and improved environmental quality	Training and fund pilot activities, dissemination and replication of improved practices through decentralization and local participation.	Ongoing (99-2005) Decree creating the Souss Massa river basin agency. 6 pilot projects launched developed in consultation through new agency	MURRAY, Sharon, USAID smurray@usaid.org http://www.eau.ma/association/association.htm
Egypt- Local Dialogue building process on water, food and the environment	To bring the local experience on a selected wetland site problematic, to a regional level and involve key stakeholders from the Middle East and the Maghreb	Initiate and launch a local dialogue around tangible solutions to reduce conflicts. Validate in the frame of a regional workshop.	Funded agreed (Sept 2003) for 3 months.	KOUVELIS, Spyros Medwet http://www.medwet.org/

Forthcoming Dialogues⁵

Region	Name of the Dialogue	Country	Issues	Dialogue Convenor	Consortium Partner	Nature of requested Support
Africa	Dialogue on Water food and environment in Greater Ruaha river basin	Tanzania	Inter-sectoral water allocation, Agriculture productivity and drying wet lands	Soil-Water Management Research Group (SWMRG), Sokoine University of Agriculture, Tanzania	IWMI, WWF	Initiating Dialogue among all relevant stakeholders and project formulation
Asia	Dialogue for Revival of a dying River to ensure sustainability, equitable distribution of water and access to livelihood resources in Rajula block of Amreli district, India	India	Up stream-down stream conflicts on water use, environmental degradation and indiscriminate exploitation of natural resources	Utthan development Action Planning Team	IWMI, WWF	Initiating Dialogue to influence state policy in basin planning and management and development of a longer term strategic plan to address the issue.
Asia	Dialogue on Basic Policies on Water Resources Development and Management of Philippines	Philippines	Policy coherence: Water, environment, agriculture	Philippines Water Partnership	GWP, ICID	Initial consultations for validating information and development of framework for water policy revision in Philippines and project formulation
South America	Creating equitable participatory conditions for an effective Dialogue on water, food and environment in Sao francisco river basin	Brazil	Agriculture, water use, river contamination, underground water quality, information dissemination, river diversion and capacity building	GAMBA– Environmental Group of Bahia (Brazil) through Rios Vivos Network	IWMI along with local partners like EMBRAPA, CODEVASF and CHESF	Initiating local Dialogues to create better conditions for the participation of minorities and social sectors in the decision making process in the basin and providing inputs to preparation of a full-fledge proposal
South America	Initiating a participatory Dialogue process in Guaraní Aquifer	Argentina, Paraguay, Brazil and Uruguay	Overexploitation of ground water, competing inter-sectoral water demands, water quality, soy monoculture and stakeholder Participation	Foro ecologista de Parana (Argentina) through Rios Vivos	IUCN, WWF	Awareness raising and establishment of multi stakeholder Dialogue processes for planning and sustainable management of basin
North America	Dialogue for a long-term Vision of Water in the Lerma-Chapala Basin	Mexico	Drying of lake Chapala, extensive irrigated farming, inter sectoral water allocation and lack of negotiation process	IMTA (Mexican Institute of Water Technology), SAGARPA (Ministry of Agriculture) and GTEPAI (Lerma-Chapala Water Council)	IWMI, IUCN, ICID, FAO	Initiate consultations to revive the blocked negotiation through the recuperation of the arguments from the representative of users in the basin in order to design new principles for negotiation

⁵ This projects were proposed during the first international Dialogue conference, held in Hanoi Viet Nam in October 2002. These proposals went through an intensive scoping phase to ensure consistency in the approach to the overall objective of the Dialogue on water, food and the environment.