

## Strategies for Water Resources Management in Situations of Emergency and Conflict

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## A PARADIGM SHIFT: EXPANDING FROM THE PHYSICAL SCIENCES TO THE SOCIAL ASPECTS AND SCIENCES

- The drive for the international hydrological programs was always fed by social responsibility
- IHD (1965-1975), leading to:
- IHP-IV - Sustainable Development
- IHP-V - Vulnerable Environment
  - **Theme 4: Strategies for water resources management in emergency and conflict(ing) situations (Coordinated by Janos Bogardi)**
- IHP-VI - Water Interactions: Systems at Risk and Social Challenges

## STRATEGY

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- A set of action rules for management under normal (?) and exceptional situations
- Rules for operating the physical (hydrological and hydraulic) and management systems
- Driven by a set of objectives, usually not commensurate and not well defined, and often conflicting, e.g. speed of recovery versus cost, who benefits from the recovery and how much
- Given as a set of general procedural guidelines or as a prescribed set of specific rules

## EMERGENCY SITUATIONS

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- Deviation from normal conditions
- Resulting from:
  - Natural phenomena, e.g. flood, earthquake, drought
  - Failure of parts of the physical system, e.g. electric malfunction, pump failure, dam break
  - Human failure, e.g. error in operation, breakdown in performance or in communication
- Time Scale
  - Rapid: earthquake, terror action resulting in supply failure or poisoning of the water, flood
  - Intermediate: flood, pollution event
  - Slow: drought, depletion of sources, deterioration of water quality

## MANAGEMENT UNDER EMERGENCY CONDITIONS

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- Planning with explicit consideration of uncertainty
- Contingency plans
- Prepare and train management, manpower, institutions, the decision makers, communication and PR
- Real-time management, leadership

## COMPETITION & POTENTIAL CONFLICT

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- Parties: Intra- and Inter-National
  - Neighbors: farmers
  - Tribes: Ethiopia
  - Sectors: farmers vs cities
  - Local governments: cities, counties
  - Nations: India-Pakistan, Central Asian Republics, Jordan-Israel, Palestinians-Israel, Danube, Rhine, Mekong
- (Im)Balance between the parties

## CAUSES FOR COMPETITION AND POTENTIAL CONFLICT

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- Many and diverse
  - Sovereignty
  - Shortage
  - Pollution
  - Hydropower
  - Fishing
  - Flood protection
  - Navigation

## WATER RESOURCES SYSTEMS

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- Hydrology and resource management of:
  - Rivers
  - Aquifers
  - Lakes, reservoirs
  - Reservoirs
  - Integrated water supply systems
  - Hydropower systems
- Scientific basis for decision making: hydrology, economics, social sciences, political sciences

## MEANS AND PROCEDURES

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- Cooperation between professionals, joint learning, studying generic problems and issues, paving the way for the politicians
- Confidence building
- Training in negotiations
- Joint training in negotiations
- Fact finding
- Mediation
- Treaties
- Institutional structures

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## IHP PROGRAMS

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- IHP-V Theme 4: Strategies for water resources management in emergency and conflict(ing) situations
- Working Group 4.1 – “Water for Peace: International Disputes and Examples”
- “Public Participation in Water Management”, Budapest, June 1999
- Negotiating Over Water (NOW) Workshop in Haifa (1997) and Proceedings (2001)
- Hydrological Challenges in Transboundary Water Resources Management, Koblenz, September 2001
- “From Conflict to Cooperation in International Water Resources Management: Challenges and Opportunities”, Delft, November 2002

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## PRODUCTS OF IHP-V Theme 4

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- Project meetings
- Studies and publications of methodologies and of cases
  - Systems analysis, game theory, economics, negotiations
  - Cases: Mekong, Danube, Rhine, Jordan, Aral Sea, Great Lakes (Canada-US)
- Workshops, bringing in experts in negotiations
- Adding to and promoting the momentum for paradigm shift
- Still to come: educational programs (IHE)

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## RELATED AND CONTINUING PROGRAMS

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- **Hydrology for Environment, Life and Policy**
  - Comprehensive view of watersheds
  - Hydrology, people, stakeholders, institutions
  - Towards integrated catchment management:
  - “Increasing the Dialogue between Scientists, Policy Makers and Stakeholders”, HELP Symposium in City of Kalmar in Sweden, 18-22 August 2002, Organized by Swedish IHP Committee – The Swedish Research Council, in cooperation with, Stockholm International Water Institute and Global Water Partnership.
- **Internationally Shared (Transboundary) Aquifer Resources Management (ISARM), IHP VI**

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## ■ PC>CP in WWAP

From Potential Conflict to Cooperation Potential

A component of UNESCO'S

WORLD WATER ASSESSMENT PROGRAM

### The PC>CP Spirit:

A shift from potential conflict to cooperation through joint and integrated management of water resources

A collection of quotes and statements, designed to sell the concepts and methodologies:

The UNESCO PC>CP Spirit is a call for changing the psychological and practical attitude to joint and integrated management of water: from potential conflict to cooperation potential (PC>CP Meeting, Delft, July 2001)

An objective of PC>CP is to bring about a change in the perception that water will be the cause of future wars among nations, and demonstrate that water has been, can be, and should be a domain for productive cooperation between neighboring countries (PC>CP Meeting, Delft, July 2001)

When Babur went to establish The Great India, he proposed the development of irrigation systems, explaining: “When all tribes concentrate their forces for development on water structures for prosperity, their brains will move away from power struggles and from searching for reasons for such struggles” (From Victor Dukhovny)

During the Cuban missile crisis and the Bay of Pigs invasion, Cuba continually provided to the US Naval Base in Cuba its needed water supply (Pete Loucks, personal experience as a pilot stationed in Cuba at the time)

The Mekong Spirit initiated by the cooperation among the four Lower Mekong River Countries in 1957 transformed the Mekong from a River of Promise to a River of Cooperation; this Spirit has established a firm foundation for further development of the Mekong into a River of Prosperity (from a statement by Ing Kieth, Chairman of the Mekong River Commission for 1995/96, Ho-Chi-Minh City, November 1995, provided by Le Huu Ti)

“Water is used to put out fires, not to ignite them”  
(Munther Haddadin, Jordanian Minister of Water and negotiator)



## RELATED PROGRAMS

### ■ Basins at Risk – Aaron Wolf, OSU

#### ■ Indicators

- Water stress is not a statistically significant indicator of water dispute
- Countries which cooperate in general cooperate about water - countries which dispute in general, dispute over water
- The higher the GNP, cooperation is somewhat more likely
- Type of government and climate show no patterns of impact on water disputes

## Significant Indicators of Potential Conflict (Aaron Wolf)

- Institutional aspects
- Most significant indicators relate to extremely rapid changes, either on the institutional side or in the physical system
- Inability of institutions to adjust adequately
- Rapid institutional change is associated with “internationalized” basins – basins whose management institution was developed under one single jurisdiction, but which was shattered as that jurisdiction suddenly became divided among two or more nations

## **Middle East Water Project – Fisher (MIT) et al.**

- Model for allocation of water among parties in a way that maximizes total benefit to all parties, subject to agreed or investigated ownership, stated rules and regulations (NOW Proceedings, WRR, to appear)
- To be applied to the water economies of Jordan, the Palestinian Authority and Israel, separately and jointly
- Developed jointly and tested separately by teams from the parties
- Discontinued, awaiting re-initiation
- Created a common perspective on joint management

## **PROPOSALS AND TRAINING FOR NEGOTIATIONS, AGREEMENTS AND TREATIES**

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- Win-Win, increase the cake in creative ways, not only divide it
- Respect the difference among the parties: cultural, social, legal, institutional, professional
- Water as one component in a broader agreement
- Pragmatic
- Detailed

## PROPOSALS AND TRAINING FOR NEGOTIATIONS, AGREEMENTS AND TREATIES

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- Deal with uncertainty
- Include water quality
- Include environmental issues
- Joint management structure
- Supervision
- Monitoring

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IHPV - The Balance sheet from a scientific perspective

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