Strategic Water Planning
with special reference to International Experiences
and Practices in UNESCO and WWF

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Only 2.5% of World’s water is freshwater.

Less than 1% of all freshwater is available for use.

Today, around 3,800km$^3$ of freshwater is withdrawn annually from the world’s lakes, rivers and aquifers.

Over the next 25 years, one-third of the world’s population will experience severe water scarcity.
Water security is defined as the capacity of a population a) to ensure access to adequate quantities of water of acceptable quality for sustaining human and ecosystem health on a watershed basis, and b) to ensure efficient protection against water related hazards (floods and droughts). In this context, water security is an increasing concern arising from population growth, drought, floods, degradation of water quality, and climate change (IHP-VIII “Water security: Responses to local, regional, and global challenges”).
The Water Planning is to ensure that water will be available to all in the long-term future for water security is complicated. No one knows for sure, for example, how much rainfall there will be in any given year, or when the next period of drought might begin.

Planning types: Water allocation plans
Long term plans
Regional demand and supply statements
Water Planning

Components of a water resources plan

1. Water resources plan
2. Options appraisal
   - Option identification
   - Supply-demand balance
     - Demand forecast
     - Supply forecast
     - Headroom
3. Deficit/Surplus
Water Planning

Water Planning Process Steps

- Describe the water resource and its use within the planning area (including identifying future risks)
- Set high-level objectives and outcomes (identify priority areas for planning)
- Set quantitative objectives in the form of measurable targets and thresholds by:
  - Conducting trade-off analyses
  - Assessing the risks to achieving these objectives
- Develop water management strategies
- Implement management arrangements
- Implement monitoring, compliance and enforcement arrangements
- Reporting and review
Water Planning

Regional Water Planning Process

- Assessment of Projected Demands
- Assessment of Current Supplies
- Assessment of Projected Needs (Shortages)
- Technical Evaluation of Water Management Strategies
- Formulation and Evaluation of Regional Water Plan

Planning process cycle

[Diagram showing the planning process cycle with steps: Plan, Do, Check, Act]
Water Planning

**River Basin Water Planning**

**River Basin Water-Related Issues :**

- Water allocation, reconciliation and utilization planning has tended to be the focus in more arid or seasonally variable basins where population and development has driven water demands.
- Water quality planning has been the focus in highly developed urban, industrial or mining dominated basins, as well as those with intensive irrigation.
- Flood risk management has tended to be the focus in higher rainfall basins, particularly where there is significant downstream development (people and property).

**Historic phases of basin planning**
Water Planning

River Basin Water Planning

Basin planning process

Strategic systems of basin planning
Water Planning

River Basin Water Planning

Generic process of basin planning, iteration and adaptation

- Basin Vision & Objectives
  - 20 year replanning
- Basin Strategies
  - 5-7 year review
- Implementation
  - Annual refinement
- Situation assessment
- Monitoring & Review
Water Planning
River Basin Water Planning
International Practices in Water Planning:

WP in Mexico

WP Plans with Murray-Darling IWRM Plan

Long-term planning in Murray-Darling basin

Source: Lu Queen and Timonier (2017).
The central strategy of Global-HELP is to put in place a global network of catchments and presently 91 basins in 67 countries have been established, dealing with a large number of different research topics in hydrology and water resources.
International HELP River Basins
(Some Active Examples)

- North America: Lake Champlain, Washita Basin, Willamette Basin
- Central and Southern America: Rio San Pdero Basin (Mexico), Reventazon-Parisimina River Basin (Costa Rica), Sao Francisco Verdaderio Basin (Brazil)
- Europe: Guadiana Basin (Portugal), Motala Strom (Sweden), Glowa Danube Basin, Mesta-Nestos River Basin (Bulgaria-Greece)
- Asia & Pacific: Tarim River Basin & Heihe River Basin (China), Indus Basin (Pakistan), Murray-Darling Basin, The Burdekin Catchment & Ord River Catchment (Australia), Langat River Basin (Malaysia), Davao Basin (Philippines), Brahmani-Baitarani Basin (India), Motueka (New Zealand), Kumho River Basin (Republic of Korea), Upper Kaligandaki (Mustang) River Basin (Nepal), Syrdarya River Basin (shared by four countries: Kyrgyz Republic, Tajikistan, Uzbekistan, Kazakhstan)

HELP actions through a global network of hydrological catchments for hydrological monitoring and data rescue
WWF (World Water Forum) Activities

WWF 7 & 8

World Water Forum

The Largest Intl. Event in the field of Water

- Every 3 years
- Co-Organization: Host Country + World Water Council (WWC)
- Forum Event (one week) + Preparatory Process (more than two years)

Mobilizing debate & action for all water issues

- Provide a Platform for all stakeholders to exchange, learn together and catalyze concrete actions for improved water resources & services development & management
- Engage policy and decision-makers in a dialogue to establish commitments

Ex. Ministerial Declaration, Water Expo from the business view
## WWF (World Water Forum) Activities

### Process Framework

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### Political Process

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<td>Economically Water Insecure (EWI)</td>
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### Science & Technology Process

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<td>Efficient water management</td>
<td>Resource recovery from water and waste-water systems</td>
<td>Water and Natural disasters</td>
<td>Smart technology for Water</td>
<td>Understanding and managing ecosystem services for water</td>
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Mechanisms were created to enhance support for continuous collective action on water.
- Implementation Roadmaps, Action Monitoring System

Greater political commitment was generated for water within policy dialogues.
- Ministerial Declaration, Parliamentarian Statement, Daegu-Gyeongbuk Water Action for Sustainable Cities and Regions

The pivotal role of science and technology as a sustainable engine for implementation of water-related solutions was highlighted.
- 5 Main Focus Areas, White Paper, CEO Innovation Panels

Dialogue and exchange was enhanced among different regions.
- Inter-Regional Sessions, Economically Water Insecure

Case studies demonstrating lessons on implementation were showcased.
- Daegu Gyeongbuk Water Prize, Water Showcase, World Water Challenge
WWF (World Water Forum) Activities

WWF 7 & 8

THEMATIC FRAMEWORK
The Thematic Structure – at a glance
WWF (World Water Forum) Activities

**WWF 7 & 8**

**THEMES**

**CLIMATE - Water security and climate change**
(SDG links: SDG 13, SDG 11.5, COP 21-22, Sendai DRR Summit)
- a. Managing risk and uncertainty for resilience and disaster preparedness – IR 1.3
- b. Water and adaptation to climate change
- c. Water and climate change mitigation
- d. Climate science and water management: the communication between science and decision/policy making

**PEOPLE - Water, sanitation and health**
(SDG links: Water targets 6.1, 6.2, 6.3, 6.B and SDGs 1 and 3)
- a. Enough safe water for all – IR 1.1
- b. Integrated sanitation for all – IR 1.2
- c. Water and public health

**DEVELOPMENT - Water for sustainable development**
(SDG links: Water target 6.4 and SDGs 2, 7, 8, 11 and 12)
- a. Water, energy and food security nexus
  - Water for Food - IR 2.1
  - Water for Energy - IR 2.2
- b. Inclusive and sustainable growth, water stewardship and industry – IR 3.1
- c. Efficient use of surface water and groundwater - urban and rural
- d. Infrastructure for sustainable water resource management and services – IR 1.4
WWF (World Water Forum) Activities

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**URBAN** – Integrated urban water and waste management
(SDG links: Water target 6.3, SDGs 11 and 14, HABITAT 3)
  a. Water and cities – IR 2.3
  b. The circular economy – reduce, reuse, recycle
  c. Treatment and reuse technologies

**ECOSYSTEMS** – Water quality, ecosystem livelihoods and biodiversity
(SDF links: Water targets 6.3, 6.6 and SDG 15)
  a. Managing and restoring ecosystems for water services and biodiversity – IR 3.2
  b. Natural and engineered hydrological systems
  c. Water and land use
  d. Ensuring water quality from ridge to reef – IR 3.3

**FINANCING** – Financing for water security
(SDG links: SDGs 6 and 17)
  a. Economics and financing for innovative investments – IR 4.1
  b. Financing implementation of water-related SDGs and adaptation to climate change
  c. Finance for sustainable development – supporting water-friendly business
**CROSS-CUTTING ISSUES**

**SHARING**-Involving stakeholders at all levels for sharing water benefits  
(SDG links: Water target 6.B and SDGs 3, 15 and 17)  
a. Sharing solutions and good practices  
b. Involving all: public, private, civil society-women and men-young and old, in bottom up and top down approaches  
c. Water, cultural diversity, justice and equity – IR 4.4

**CAPACITY**-Education, capacity building and technology exchange  
(SDG links: water target 6.A and SDGs 4 and 17)  
a. Enhancing education and capacity building – IR 4.5  
b. Science and technology and decision/policy making – 7th World Water Forum S&T Process  
c. ICT and monitoring  
d. International cooperation

**GOVERNANCE**-Water governance for the 2030 Development Agenda  
(SDG links: Water target 6.5 and SDG 17)  
a. SMART implementation of IWRM - IR 3.4  
b. Cooperation for reducing conflict and improving transboundary water management – IR 4.3  
c. Effective governanace: Enhanced political decisions, stakeholder participation and Technical information –IR 4.2