Master Training Program on Water (Water Supply, In-house Processing, End-of-Pipe) in Textile and Garment factories

Promotion of Sustainability in the Textile and Garment Industry in Asia - FABRIC

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

FABRIC Asia

Day 1: **Presentation 2**

Introduction to Integrated Water Resource Management (IWRM)

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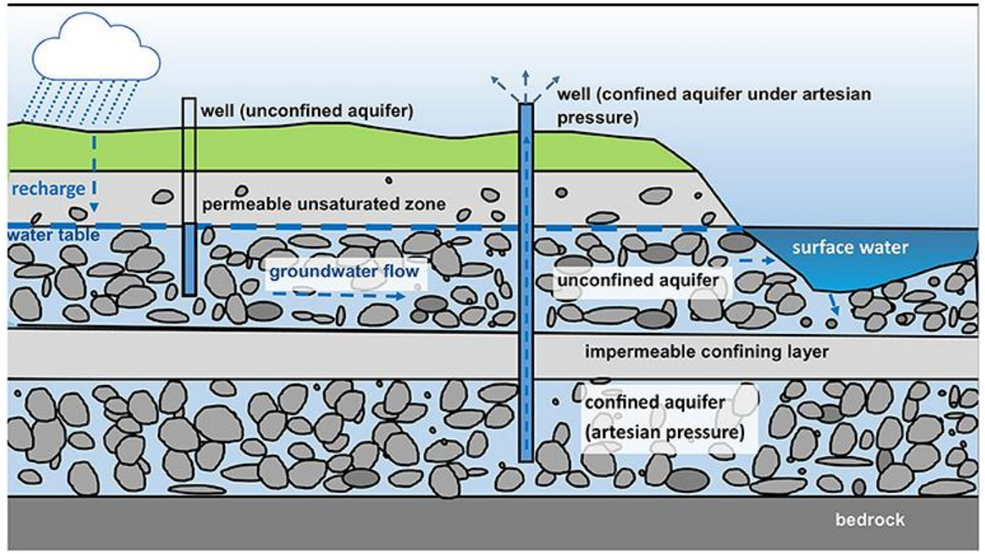
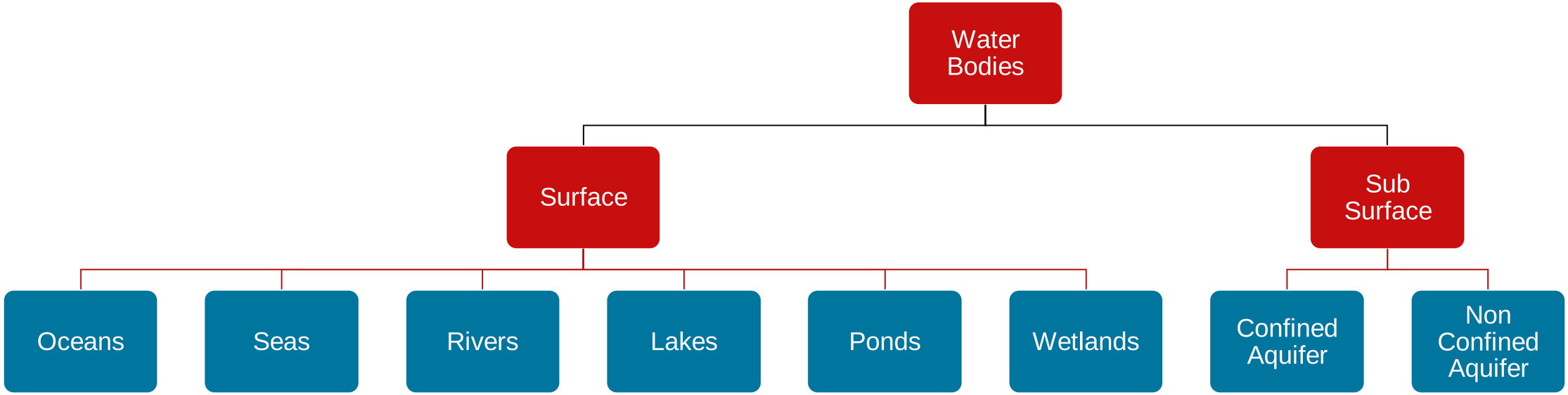
I. Water Resources and Their Consumers

Types of Water Bodies

Only 3% of the total amount of water in the world is freshwater and less than 1% of this is readily usable by humans.

Three quarters of the world's supply of freshwater exists in frozen form. The remaining quarter of fresh water available in liquid form exists primarily as groundwater (96%).



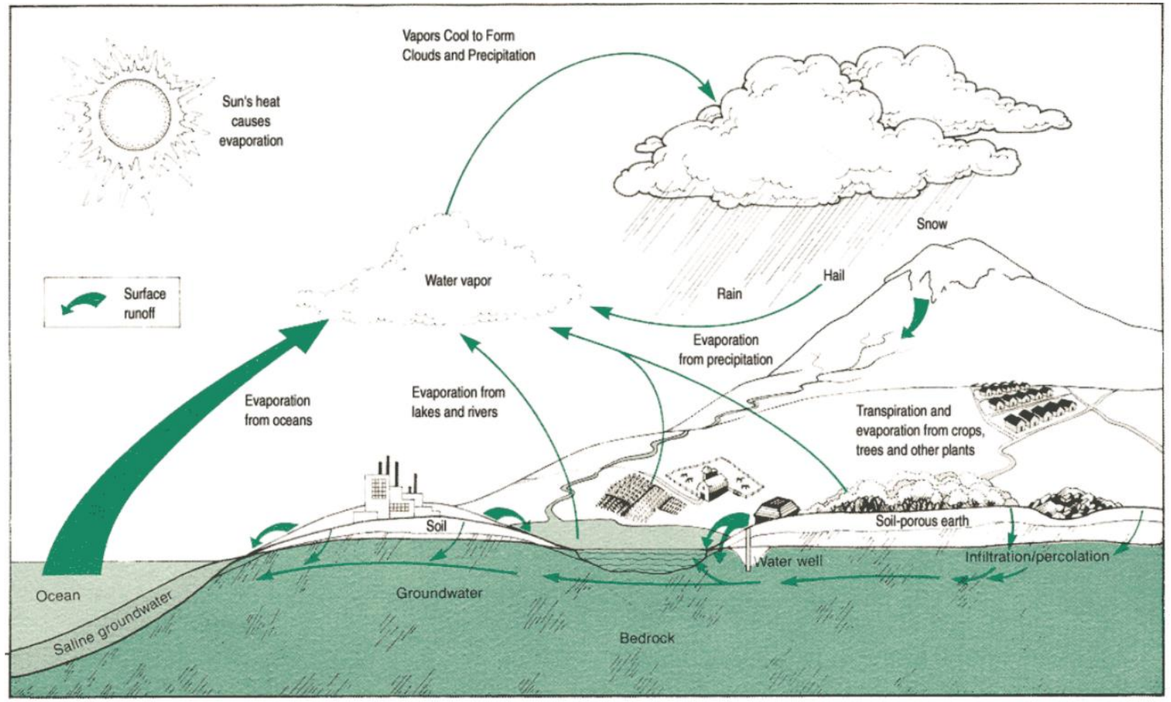


I. Water Resources and Their Consumers

Interconnections of Water Bodies

Hydrological Cycle

- **Atmosphere**
  - ✓ gaseous envelope above the earth
- **Hydrosphere**
  - ✓ all water bodies on the surface of the earth
- **Lithosphere**
  - ✓ rock layer covering the earth
- **Cryosphere**
  - ✓ all ice caps on the surface of the earth



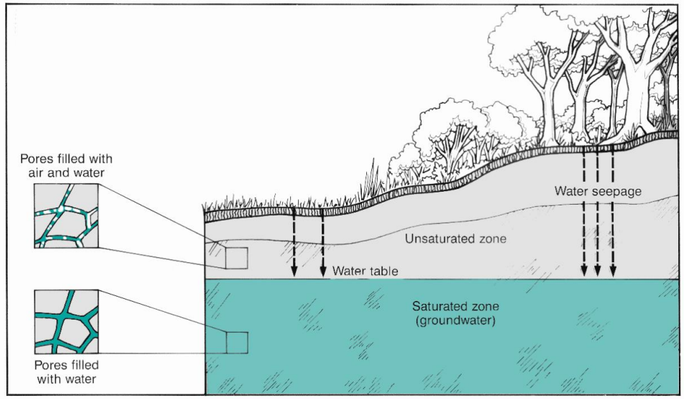


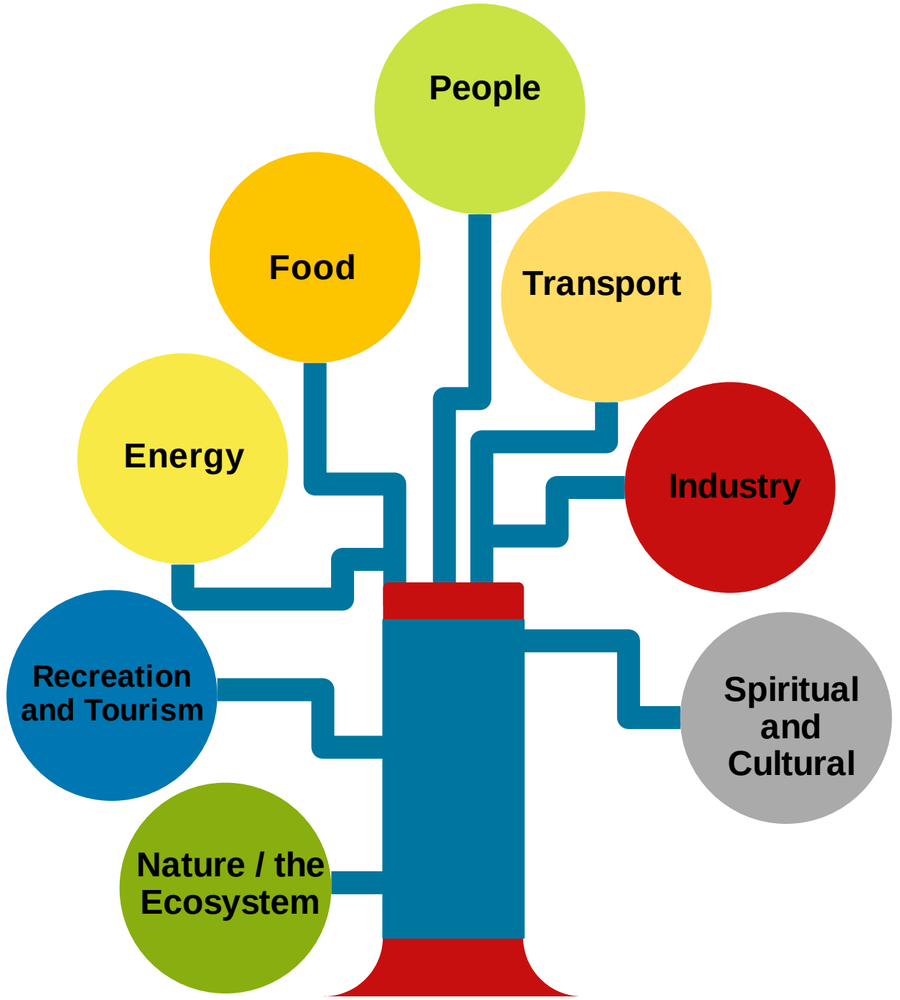
Figure 1.3 - Groundwater Infiltration [2]

I. Water Resources and Their Consumers

Usages in Sectors of the Economy

Many civilizations have thrived at the banks of rivers.

- Water for People
- Water for Food
- Water for Energy
- Water for Transport
- Water for Industry
- Water for Recreation and Tourism
- Water for Spiritual and Cultural Values
- Water for Nature / the Ecosystem



II. Historical Development of Managing Water Resources

Mid 20th Century Milestones

- There are many examples of the management of water resources in history practicing a variety of integrated approaches.
  - ✓ Sectoral integration - Integrating a variety of water consumption sectors
  - ✓ Biophysical resource-based integration
  - ✓ Spatial integration - Upstream and downstream interlinkages
- An early example of water resource management concerns the establishment of the Tennessee Valley Authority in 1933 to address flood control, power production, public health and erosion control.
- In 1957 a report on integrated river basin development was prepared which emphasised the coordination and integration of measures in the water sector. This report indicated the need for secondary measures along with primary engineering measures adopted for addressing the multifaceted challenges of the water sector.

II. Historical Development of Managing Water Resources

Mar Del Plata Action Plan (1977)

In 1977 the first ever high-level conference regarding water challenges was organized at Mar Del Plata, Argentina by the United Nations.

At the conference a comprehensive set of recommendations to achieve progress, also known as the **Mar Del Plata Action Plan**, were framed for managing water challenges**.**

Recommendations were proposed in the following areas:

a. Assessment of water resources
b. Water use and efficiency
c. Environment, health and pollution control
d. Policy, planning and management
e. Natural hazards
f. Public information, education, training and research
g. Regional cooperation
h. International cooperation

II. Historical Development of Managing Water Resources

The Four Dublin Principles (1992) and Earth Summit (1992)

The Four Dublin Principles presented in 1992 during The International Conference on Water and the Environment held in Dublin provided four guiding principles regarding water resources.

1. Freshwater is a **finite and vulnerable resource**, essential to sustaining **life**, **development** and the **environment**.
2. Water development and management should be based on a **participatory approach** involving users, planners and policy makers at all levels.
3. **Women** play a central role in the provision, management and safeguarding of water.
4. As water has **an economic value** in all its competing uses, it should be recognized as an economic good.

II. Historical Development of Managing Water Resources

The Four Dublin Principles (1992) and Earth Summit (1992)

The first principle was very significant in highlighting the requirement that water be employed sustainably for the sake of the environment.

The concept of Integrated Water Resources Management (IWRM) was placed on the international agenda in the Rio Conference in 1992 [first defined by Agenda 21 (Chapter 18)].

II. Historical Development of Managing Water Resources

Hague Declaration on Water Security (2000) and

Global Water Partnership (2000)

In 2000 The **Hague Declaration** on water security formulated a **world water vision** highlighting the following aspects:

- Meeting basic needs
- Securing the food supply
- Protecting ecosystems
- Sharing water resources
- Managing risks
- Valuing water
- Governing water wisely

II. Historical Development of Managing Water Resources

Hague Declaration on Water Security (2000) and Global Water Partnership (2000)

“IWRM is a PROCESS which promotes the CO-ORDINATED development and management of WATER, LAND and related RESOURCES, in order to maximize the resultant ECONOMIC and SOCIAL welfare in an EQUITABLE manner without compromising the SUSTAINABILITY of vital ECOSYSTEMS.”

Although the water vision document explains IWRM, the clear definition of water vision was provided by The Global Water Partnership (GWP) in 2000.

III. Elements of IWRM

IWRM Connection to Sustainable Development Goals

Dedicated	Explicit	Implicit
6 CLEAN WATER AND SANITATION	1 NO POVERTY 3 GOOD HEALTH AND WELL-BEING 4 QUALITY EDUCATION 11 SUSTAINABLE CITIES AND COMMUNITIES 2 ZERO HUNGER 12 RESPONSIBLE CONSUMPTION AND PRODUCTION 14 LIFE BELOW WATER 15 LIFE ON LAND 7 AFFORDABLE AND CLEAN ENERGY	5 GENDER EQUALITY 8 DECENT WORK AND ECONOMIC GROWTH 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 10 REDUCED INEQUALITIES 16 PEACE, JUSTICE AND STRONG INSTITUTIONS 13 CLIMATE ACTION 17 PARTNERSHIPS FOR THE GOALS

SDG Target 6.5

“By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.”

III. Elements of IWRM

Linkage of Development Challenges with IWRM

Key Development Challenges	IWRM Advantages
Adapting to climate change	Better planning for more resilient water resources
Mitigation of disaster risk	Better disaster preparedness
Food security	Efficient crop production through irrigation
Health risks	Better management of water quality
Health of aquatic life	Maintenance of minimum environmental flows
Sustainability of water infrastructure	Multipurpose infrastructure providing support across various sectors
Land and water management	Management of land and water based on their interconnection and mutual impact
Transboundary collaboration	Realistic and rational collaboration
Water and energy interconnection	Rationale use of water for energy production

III. Elements of IWRM

Principles of IWRM

IWRM is based on the following three principles:

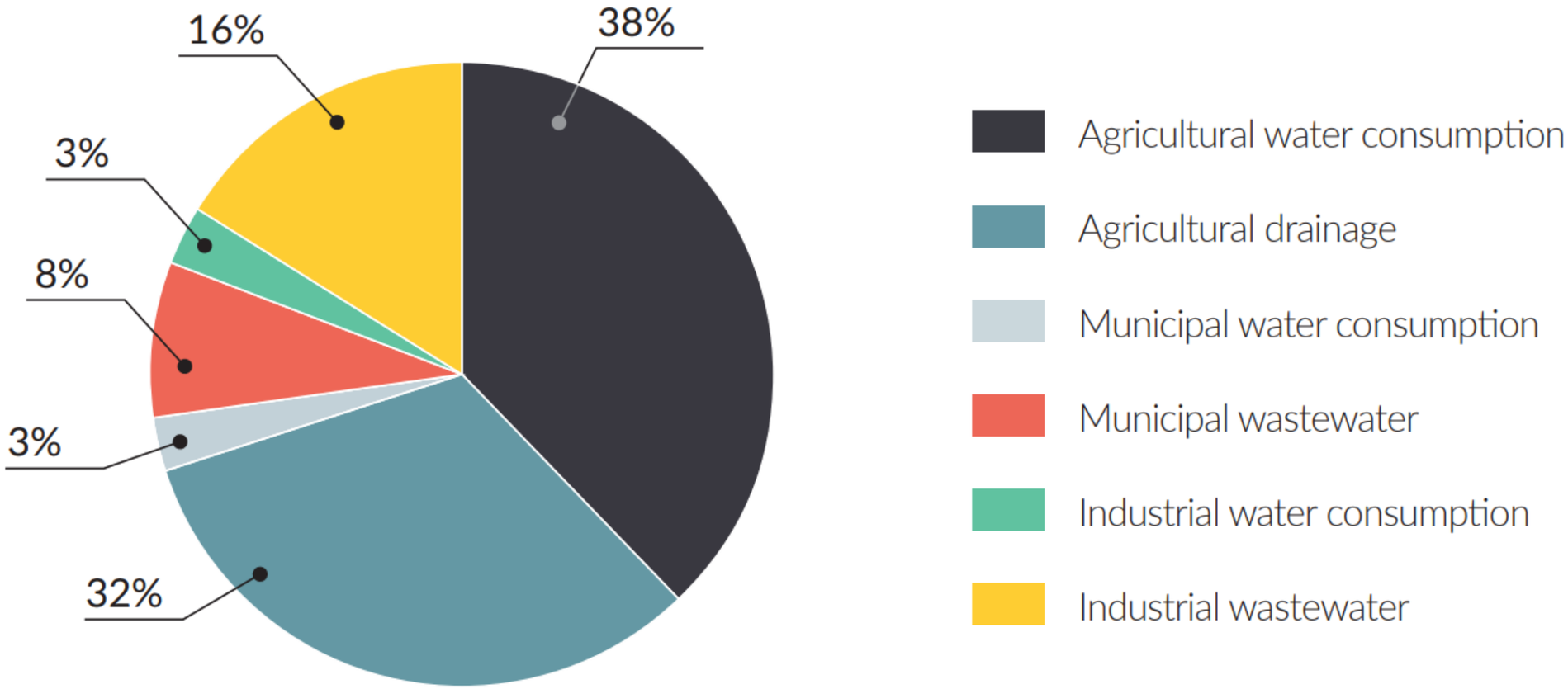
- **Social Equity**: Ensuring equal access for all users (particularly user groups that are marginalized and poor) to an adequate quantity and quality of water required for the sustenance of the well being of human beings. Also to be considered when making water allocations is the right of all users to the benefits gained from the use of water.
- **Economic Efficiency**: Achieving the greatest benefit for the greatest number of users possible by means of the available financial and water resources. This requires selecting the most economically efficient option available.
- **Ecological Sustainability**: As aquatic ecosystems are acknowledged as users, it is therefore required that adequate allocations of water be provided in order to sustain their natural functioning.

III. Elements of IWRM

Consumption Breakdown of Freshwater Withdrawals

UN World Water Report 2017

The agriculture sector alone is responsible for 70% of water abstractions worldwide.



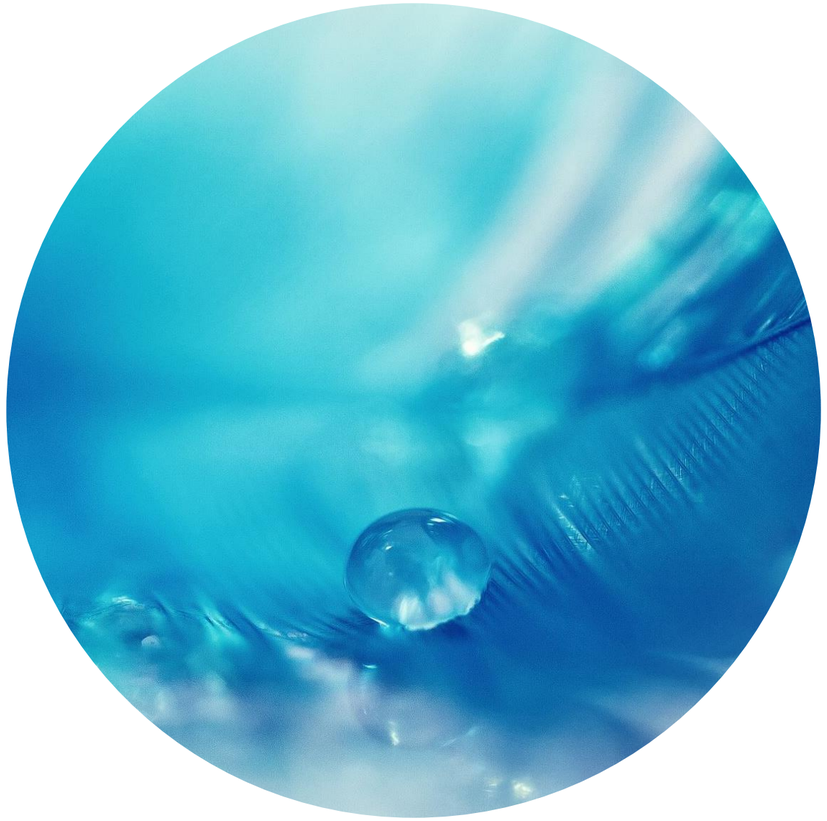
III. Elements of IWRM

Water for Businesses

Around 93b m^3 of water is used to produce clothes on an annual basis.

Approximately 20% of the world's wastewater comes from the dyeing and treatment of textiles.

As a cost item in industry, the efficient usage of water presents not only an operational challenge, it also provides an opportunity for growth through the incentive of minimizing water use (e.g. through wastewater use and recycling) to reduce expenses and water dependency.



III. Elements of IWRM

Integrated Approach for a Textile Factory

Water is critical for textile factories, especially those employing wet processing.

As significant water consumers, textile factories are not only affected by other water consumers but they also affect these consumers as well. Consequently, it is very helpful to manage water resources sustainably through an integrated approach (IWRM).

Catchments need to be determined in order to identify the stakeholders for the sustainable management of water resources.

LS&Co, partnered with Earth Genome, Arizona State University (ASU) and WWF-US, developed a hydrological modeling tool to assess integrated surface and groundwater resources in the Ravi River basin to support their suppliers in decision-making matters regarding water resources.

III. Elements of IWRM

Integrated Approach for a Textile Factory

Challenges for a Textile Factory	Challenges posed by a Textile Factory
Depletion of water supplies through increased numbers of consumers in the catchment	Untreated wastewater contaminating surface water resulting in unhealthy conditions for aquatic life
Deterioration in the quality of surface water supply to a factory due to contamination from untreated sewage in the catchment increasing the cost of the treatment of water supply prior to use in factory	Untreated wastewater contaminating shallow groundwater normally accessible to domestic consumers, resulting in health problems in communities living in the catchment area
Torrential rains due to climate change resulting in flooding the textile facility and lack of storm water management in the factory	High water consumption in a factory thereby lowering the groundwater level making it difficult for domestic consumers to abtract water
Approval and establishment of another textile factory using water from the same resources, i.e. an aquifer	
Cultivation of water-demanding crops in the catchment	

IV. Alliance for Water Stewardship

Connecting Private Businesses with IWRM

Water Stewardship is a concept which recognizes water as a shared resource facing competing demand from multiple user groups and encourages businesses to think outside the box.

This concept shares same objectives like those of IWRM and directly connects with businesses:

- Equity, environmental sustainability, and economic
- Mobilization of multiple actors and calls for joint actions

IV. Alliance for Water Stewardship

Connecting Private Businesses with IWRM

Water Stewardship, a set of practices focusing on water users, supplements bottom-up aspects of IWRM. The following are the foundational elements of Water Stewardship:

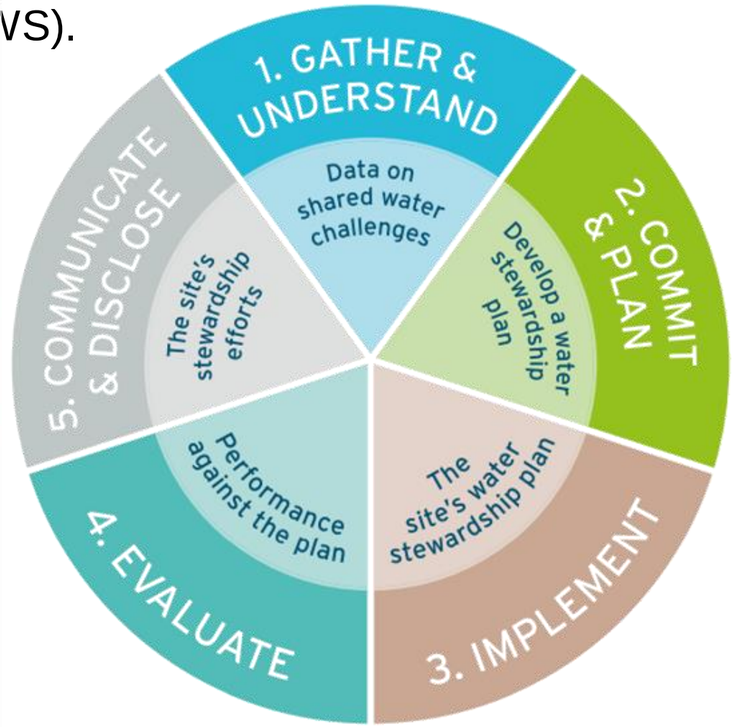
- Water is a shared resource.
- Shared risks are emerging due to the unsustainable use of water.
- An integrated response is required involving key stakeholders including businesses, the community, policy makers, etc.

IV. Alliance for Water Stewardship

For businesses some standards are available for the sustainable management of water resources based on an integrated approach; one standard concerns the Alliance for Water Stewardship (AWS).

The AWS outlines five steps for implementation

1. Gather and understand shared water challenges, risks, impacts and opportunities
2. Commit and plan
3. Implement a stewardship plan to mitigate risks and improve impacts
4. Evaluate the performance of implementation
5. Communicate and disclose the site's stewardship efforts



The AWS intends to achieve five main outcomes for the SITE and its defined physical scope

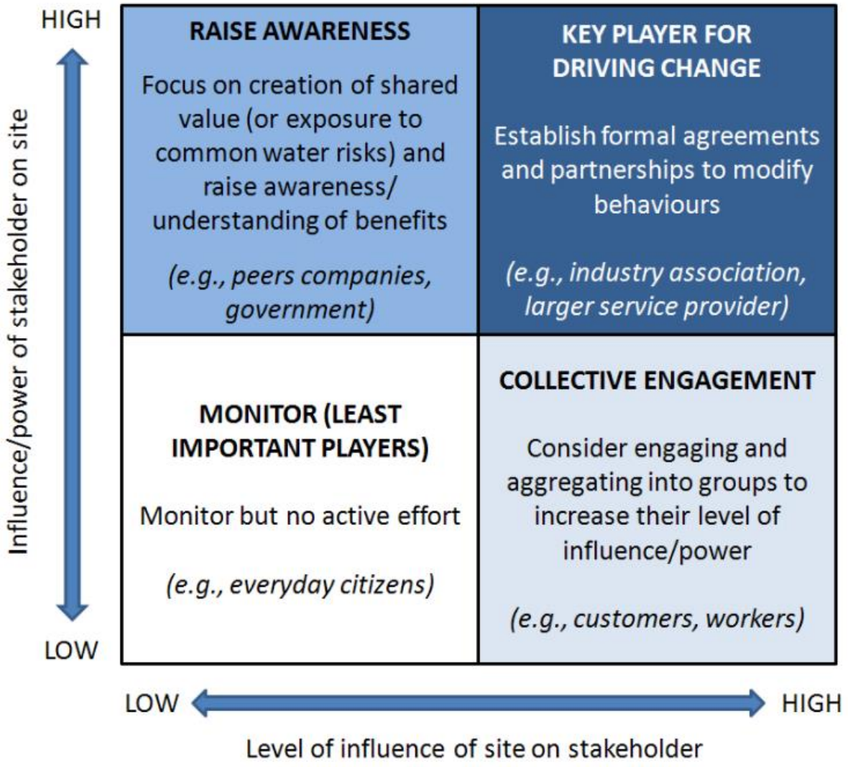
1. Good water governance
2. Sustainable water balance
3. Good water quality status
4. Important water-related areas
5. Safe water, sanitation and hygiene for all (WASH)

IV. Alliance for Water Stewardship

Steps for Implementation: Gather and Understand

Define the SITE's Physical Scope for Water Stewardship

- Know your water sources in terms of their location, design, age, condition and risks
- Gather data on SITE's water consumption - Water balance
- Define important water related areas (IWRA)
- Know SITE's indirect water use (influenced and influencing supply chain actors) - ISO 14046 Water Footprint Life Cycle Analysis methodology maybe used
- Identify the catchment and water-related areas
- Mapping of stakeholders based on the identified catchment
  - Stakeholders having impact on the organization
  - Stakeholders affected by the organization
  - Stakeholders having a common interest
  - Stakeholders not directly involved who need to be informed
- Understand current and future shared water challenges in the catchmen
- Understand SITE's water risks and opportunities
- Understand best practices towards achieving AWS outcomes



IV. Alliance for Water Stewardship

Steps for Implementation: Commit and Plan

Commitment from senior management with public disclosure is essential to ensure the following:

- The organization is motivated.
- The organization can allocate resources to implement AWS.

Planning for Implementation of AWS

- All the data gathered in Step 1 will support the planning process.
- The organization needs to develop a water stewardship strategy and plan.
  - The strategy includes a vision, a mission and overarching goals.
  - The plan provides details of targets associated with the strategic goals and needs to be structured around the five outcomes in AWS.
  - The plan should address the risks, challenges and opportunities identified in Step 1 and needs to demonstrate readiness to respond to water risks.
  - The plan should have SMART (specific, measurable, achievable, realistic and time-based) actions for achieving targets when pursuing goals.

Steps for Implementation: Implement

After developing a plan in Step 2, the implementation phase starts.

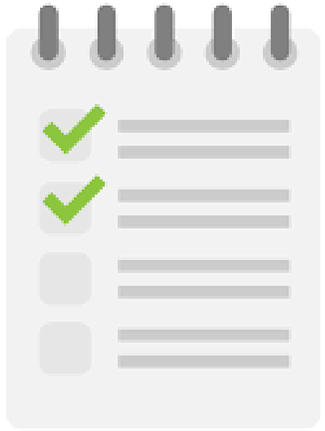
The effectiveness of the implementation depends upon clear instructions, processes, and procedures, clearly defined roles & responsibilities, as well as training and awareness.

The plan should be implemented to achieve the following:

- Address the shared risks based on the catchment in collaboration with key stakeholders.
- Comply with legal, regulatory requirements and water rights.
- Achieve SITE water balance and quality targets.
- Maintain or improve important water-related areas in the catchment.
- Maintain or improve indirect water use in the catchment area.
- Achieve best practices with regard to the five outcomes in AWS.

IV. Alliance for Water Stewardship

Steps for Implementation: Evaluate



Periodic review and performance analysis (at a minimum annually) is key for continual improvement.

Implementation should be evaluated for the following:

- Onsite performance
- Impact of water-related emergency incidents
- Stakeholder consultation feedback

Based on the evaluation, SITE's water stewardship plan can be improved.

IV. Alliance for Water Stewardship

Steps for Implementation: Communicate and Disclose

Communication and disclosure are key aspects and directly linked with the commitment to implement a water stewardship plan.

The internal water governance of SITE needs to be disclosed providing a summary of how water-related issues at the site are governed at the SITE level.

Communicate the water stewardship plan with stakeholders and disclose the efforts collectively addressing the shared water challenges.

Communicate transparency in water-related compliance.

Supporting Tools and Resources for Accessing Water Resources

Water Risk Filter 6.0 by WWF

Aqueduct by World Resource Institute (WRI)

IWRM Toolbox by Global Water Partnership (GWP)

water footprint network

India water tool

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