



RESEARCH
PROGRAM ON
Water, Land and
Ecosystems



Water in a green economy – A vision

(New opportunities and challenges in implementation of IWRM principles)

Herath Manthrithilake
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A water-secure world

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WATER SCARCITY ...

- There is general consensus that when people have access to less than **1,700 cubic meters of water per year**, a considerable proportion of them will be **trapped in poverty** (Falkenmark et al. 1989).
- The Organization for Economic Cooperation and Development (OECD) defines water stress as “**severe**” when the **ratio of total water use to renewable supply exceeds 40 %** (OECD 2009).
- Using this measure, by 2030 nearly **half the world’s population** (3.9 billion people) will be living under conditions of **severe water stress**.

THE REASONS FOR THE EMERGENCE OF THIS SCARCITY INCLUDE:

- *Population increase*
 - *Increased living standards*
 - *Over-exploitation*
 - *Water pollution*
 - *Ecosystem degradation*
 - *Adverse climate change*
-
- when combined with effects of climate change on dryland production systems, the International Food Policy Research Institute estimates that the aggregate effect of climate change is likely to be a significant reduction in total agricultural productivity.

SCARCITY ...

- the magnitude of this emerging water-scarcity challenge, the **2030** Water Resources Group has **projected global demand** for water and, under **different scenarios**, compared it **with likely supply**.
- They concluded that if there is **no improvement in the efficiency** of water use, in **2030 demand** for water could **outstrip supply by 40 %**.
- Clearly, a **gap of this magnitude** cannot (and will not) be sustained.

SCARCITY ... OLD WAYS ARE NO LONGER VALID!

- Under a **business-as-usual scenario**, improvements in **water productivity** can be expected to **close around 20 % of the gap** between global demand and supply.
- **Increases in supply** through the construction of **dams** and **desalination** plants, coupled with actions such as **increased recycling**, can be expected to **close the gap by a similar amount**.
- The **remaining 60%**, however, must come from increased **investment in infrastructure** and **water-policy reforms** that improve the efficiency of water use.
- **If the resources are not found** to facilitate a **significant increase in efficiency** and if the **water-policy reforms are not implemented**, water ***crises must be expected*** to emerge.
- The average rate of improvement in water productivity and supply enhancement needs to **increase at double the rate of improvement** achieved in the **past decade**.

CHALLENGES ...

- Associated with **water scarcity** and **declining water quality** in many parts of the world.
- IWMI has identified **two types of water scarcity**: **physical** scarcity and **economic** scarcity.
- **physical scarcity**: the sustainable **supply limit has been reached** and **little opportunity** to construct more dams remains.
- **Economic scarcity**: it is possible to increase supplies **if the financial resources** necessary to build a new dam can be found.
- The International Water Management Institute is of the view that economic scarcity is widespread in sub-Saharan Africa and in parts of South and South-East Asia (Molden 2007).

THE RECOMMENDATIONS HAVE BEEN SIGNIFICANTLY INFLUENCED BY ...

- Development of the Dublin principles in 1992 : “**Water has an economic value** in all its competing uses and should be recognized as an **economic good**” (Global Water Partnership 1992);
- Camdessus Report on financing water infrastructure: that called for drastic improvements in **accountability, transparency and capacity-building** in the public utility sector coupled with a doubling of funding for the sector (Winpenny 2003);
- Guria Task Force Report on “Financing water for all”: recommends a **transition to full cost recovery**, the phasing out of subsidies and the devolution of responsibility for water supply and treatment to local government and municipalities (Guria 2006);
- World Commission on Dams (2000) warned of the need to **carefully assess the costs and likely benefits** of major infrastructure investments;
- WHO's various reports on **global water supply and sanitation**; and
- 2030 Water Resources Group's report (2009) on **ways to avoid water crises**.

- Unlike most other natural resources, **water flows readily across and through landscapes** in complex ways that affect its **availability and opportunities to manage it.**
- **Understanding** these water flows **is critical** to the design of investment programs and policies necessary to support a transition to a green economy.

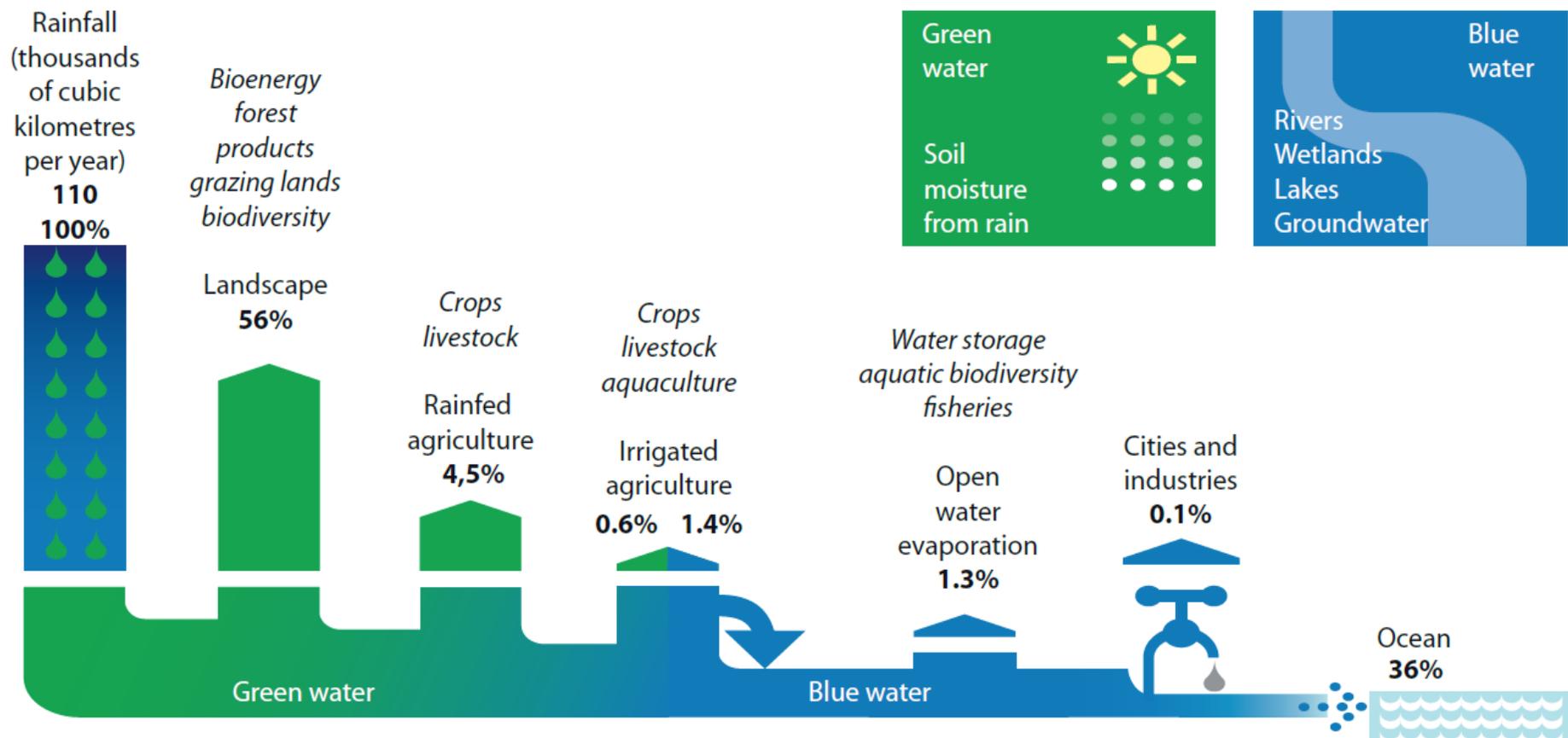


Figure 1: Green water refers to rainwater stored in the soil or on vegetation, which cannot be diverted to a different use. Blue water is surface and groundwater, which can be stored and diverted for a specific purpose

Source: after Molden (2007)

ACCESS TO WATER RESOURCES ...

- is heavily dependent upon the nature of the water cycle.
- A massive amount of water reaches the earth's land surface, but only around 40 per cent, goes over the surface, before cycling back into the atmosphere (see next slide).
- Of the water that is extracted for human purposes, (on average, approximately):
 - 70 % is used in agriculture;
 - 20 % is used by industry (including power generation); and
 - 10 % is used for direct human consumption.

- **Bulk** of the water is channeled towards **agriculture**.
- Irrigated land produces around **40 %** of the world's **food** (Hansen and Bhatia 2004; Tropp 2010).
- The biggest **challenge** faced by water managers is to find a way to **increase the productivity** of irrigated agriculture without adversely affecting the **environment** or **food security**.
- There are opportunities to **enhance supplies at reasonable cost**.

ISSUES ARE NOT SAME ...

- Managing large, complex, **transboundary water systems** typically requires a different approach to overseeing **smaller water systems**.
- **In developing countries:** water management and investment are typically geared towards **reducing poverty** and **enabling economic development**;
- **The developed nations** tends to be **maintaining infrastructure** and supplying **access to water at reasonable cost**.
- **In both cases**, there is a need to focus more on **long-term sustainability of systems and services provided**.
- **Demand and supply** also vary greatly.
- In **Singapore**, almost all water is extracted **for urban and industrial purposes**, while in many other **parts of the world**, the majority of water is extracted for **agricultural or mining purposes** (Cosgrove and Rijsberman 2000).

SERVICES FROM NATURAL INFRASTRUCTURE

- Water is key to ecosystem services that stem from the earth's natural capital and vice versa.
- **Protecting** the natural ecosystems of river basins and restoring degraded **catchment areas** is crucial to securing **water supplies**, **maintaining their quality**, **regulating floods** and **mitigating climate change** (Khan 2010; TEEB 2008, 2009a, b, c).
- The **role of forests, wetlands** and other ecosystems, floodplains is also needs to be recognized and quantified.
- **Water dependent ecosystems** also play an important role in the provision of **cultural benefits** (Millennium Ecosystem Assessment 2005).

IN GREEN ECONOMIES, ...

- The role of water in both **maintaining biodiversity and ecosystem services** is **recognized, valued and paid for**.
- The use of technologies that **encourage efficient forms of recycling and reuse** is encouraged.

IN A GREEN ECONOMY...

- The **emphasis** is investing in sectors that **rely upon and use natural resources and ecosystem services**.
- This needs to be coupled with a set of policies and institutional **arrangements** that **neither degrade** the environment **nor impose costs** on others.
- The **interest** is to **safeguard all that for future generations or sustainability**.
- In the case of water, there are **many of the potential changes required**.
- **In places where water is scarce**, the situation needs to be recognized and **managed carefully**.

ACHIEVING THE GREEN OBJECTIVES ...

- Can be accelerated through:
 - the **redesign of governance arrangements**,
 - the adoption of policies that
 - reflect the full costs of use
 - the costs of adverse impacts on the environment,
 - through improved regulation, and
 - the improved specification of property rights,
- Use must be kept within sustainable limits.

IN MARCHING TOWARDS A GREEN ECONOMY ...

- In many countries:
 - there is a **lack of reliable data** on the water of river basins,
 - the **condition of built infrastructure** and
 - the **performance of the water sector**.
- Hence, first and foremost need is to **invest on assembling data** in a manner that **enables water to be managed effectively** and the **performance of regions**.

SIGNS OF MOVING TOWARDS A GREENER ECONOMY ...

- Valuation of the **benefits** of good water management and **costs of not doing so**;
- Evidence of **increased investment** in the water sector that gives consideration to the environment;
- The formal recognition of **water rights and its allocation to users** including the environment;
- **Legal recognition** of the importance and the role of **ecosystem services** in the economy;
- Investments in the development of **institutional capacity to manage ecosystems** on a sustainable basis;
- Removal of policies that **discourage ecosystem conservation** and/or investment;
- Moving towards the **full cost recovery of resource use** while securing the needs of disadvantaged people in a community; and
- **Addressing issues** related to **ecosystem degradation critical to supply of water** quantity and quality.

INDICATORS TO BE TRACKED ...

- The **number of people without access** to reliable supplies of water;
- The **volume** of water available **per person** in a region;
- The **efficiency** of water supply and use in the **urban sector**;
- The efficiency of water use in the **agricultural** and **industrial** sectors; and
- The water use and water related **impacts of countries**.

IN CLOSING ...

- Climate change is a serious challenge to all our activities.
- Impact of climate change will be felt through water.
- Water Management and Agriculture no longer can be the same under new scenarios.
- These pressures make us to be more inclined towards natural systems!
- In Central Asia, we can do lot! Because we are together!
- We can show the way forward to world!
- We at IWMI are pleased to be partner in this endeavor!
- Let me wish all of you a very good success in this journey!

WE LOOK FORWARD FOR COOPERATION!

- <http://www.iwmi.cgiar.org/resources/apps/>

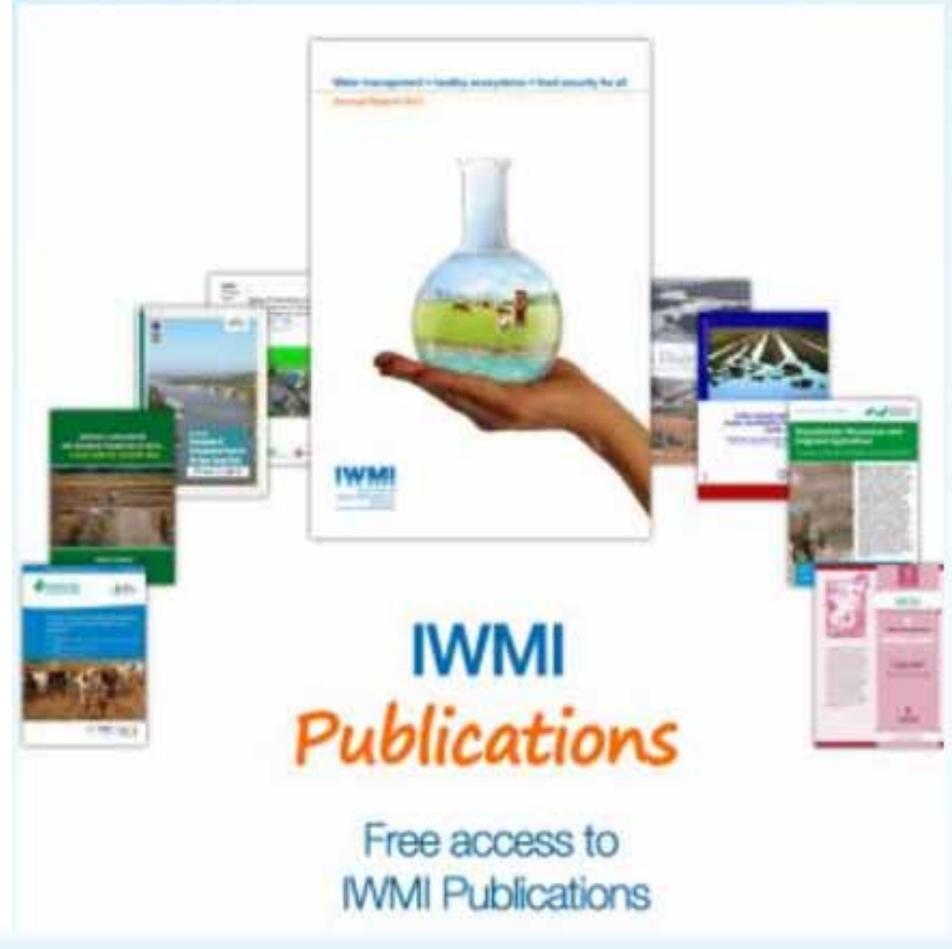
IWMI-Data

A graphic for IWMI Data featuring a central 3D illustration of a floating island with a tree, a pond, and a waterfall. Surrounding this are icons for a satellite, a cloud with rain, a server rack, and a map. The text 'IWMI Data' is prominently displayed in blue and orange, with the tagline 'One stop access to IWMI's Data' below it.

**IWMI
Data**

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IWMI-Publications

A graphic for IWMI Publications showing a hand holding a round-bottom flask containing a landscape scene. Several book covers are arranged around the flask. The text 'IWMI Publications' is displayed in blue and orange, with the tagline 'Free access to IWMI Publications' below it.

**IWMI
Publications**

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