

Mainstreaming of Environmental Flows into Integrated Water Resources Management

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Adopting EFlows as a tool in Integrated Water Resource Management (IWRM)

Prof. J.J. Kashaigili

Sokoine University of Agriculture, Tanzania



Introduction

- Water is **essential to all kinds** of **human development** and **livelihood support systems** including **ecosystems management**, sustaining both **aquatic and terrestrial ecosystems**.
- However, water resources are now under **pressure due to increased competing demands - over-allocated** and/or **highly modified**, access to good quality water is limited or competitive; and **global warming**, which have led to **complex water management challenges**.
- Recently, the **impacts of human society** on the environment is beginning to **threaten** the basic foundation upon which humans depend for food, shelter and well-being.



Introduction cont..

- **Rising demands for water** and other natural resources as a result of **increased population**, compounded by the **inappropriate use** and **poor management of land and water resources** have **increased negative effects** on **economic growth**, on **social welfare** and on the world's systems such as **coastal and marine environment**.
- **Poor management of river basins** has resulted into **degradation of water catchments** consequently affecting river flows in both **quantity** and **quality** with devastating impacts on the downstream → **increased inflow of nutrients, and sediment deposits on the sea bottom, and variation of flow regimes**.

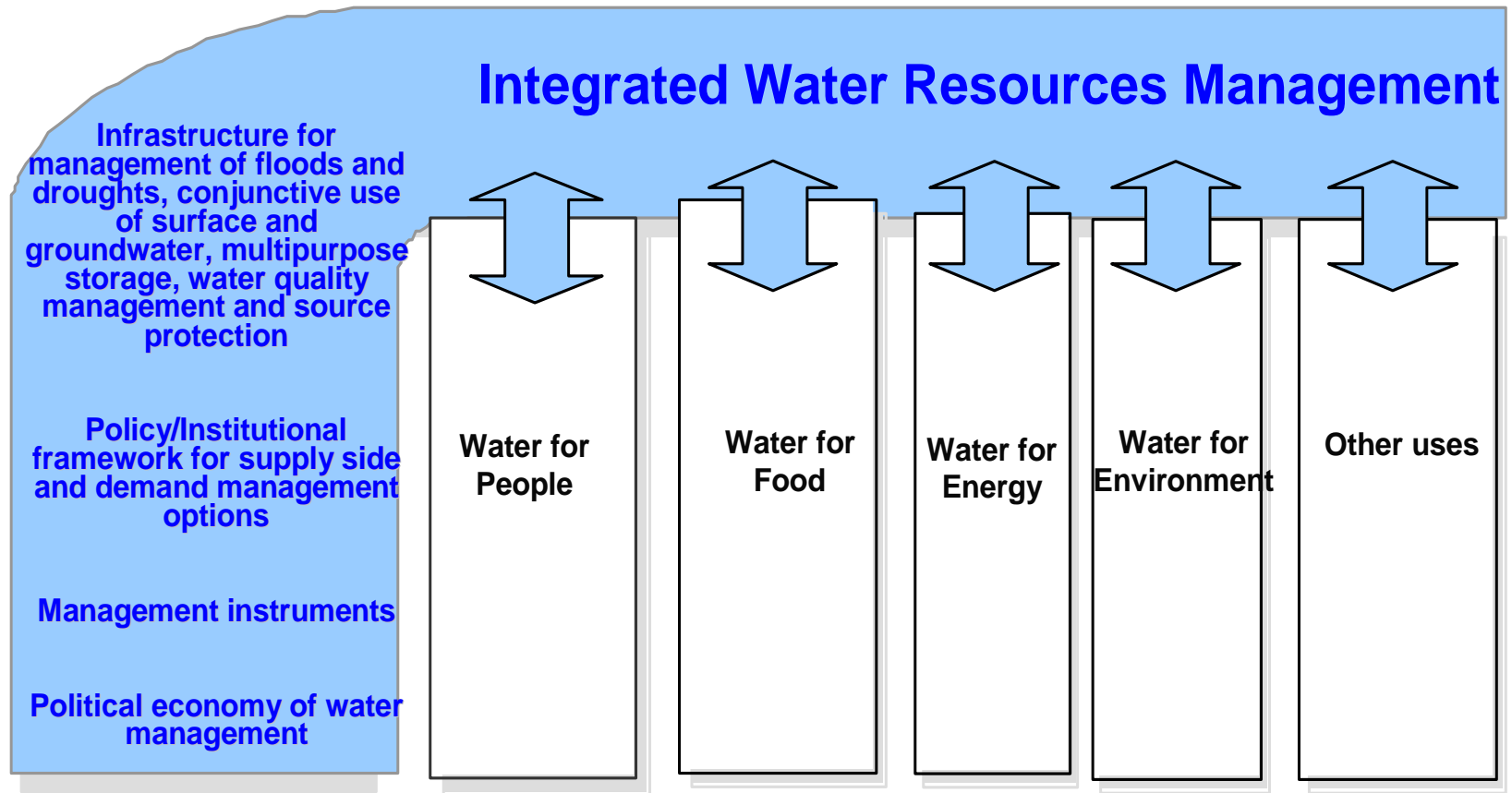


Introduction cont..

- The **drivers for the change**, namely **deforestation**, **overgrazing**, and **extensive land based rural activities** in the **upstream catchment areas** play a significant role on the **altering flow regimes** and sediment deposition.
- Traditionally, **the focus has been on providing enough water for human needs**, with **little attention to the environment**.
- However it has been **recently recognised** that **provision of water for the environment** is **one component of an intersectoral water allocation process** in which the right to the use of water is distributed amongst various users.
- Since the 1990s, the **legitimacy of environmental requirements** alongside **economic** and **social needs** for water has been a part of **Integrated Water Resources Management (IWRM)**.



Integrated Water Resources Management



Water by usage



Introduction cont..

- EFA has in the **recent years** gained attention and **scientifically accepted method** for determining the **quantity, quality,** and **timing** of flows needed to **sustain ecosystems** and **ecosystem services**.
- In this case **provision for EFs** is currently becoming a central issue in the **debate of IWRM** in river basins.
- **Plans for the further development of water resources** are being formulated in the **framework of IWRM**, which **seeks to develop and manage water in a manner that maximizes economic and social benefits for multiple water users without degrading ecosystems**.



Understanding Environmental Flows and its contribution to IWRM

- **Environmental flow (EF)** is the water that is **left in** river ecosystem, or **released into it**, for the specific purpose of managing the condition of that ecosystem.
- The Brisbane Declaration, (2007) describes environmental flows as “***the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems.***”



Understanding Environmental Flows and its contribution to IWRM

- The concept of **environmental flows** is **adaptive and essential to the wider IWRM** approach. It is **closely linked to the concept of ecosystem services**.
- Environmental flows are effectively a **balance between water resources development and the need to protect freshwater-dependent ecosystems**.
- When thinking about environmental flows it is important to ***consider all aspects of the river and drainage system***. The **basin** must be viewed from its **headwater to the estuarine and coastal environments**.



Understanding Environmental Flows and its contribution to IWRM

- EFs improve water management by ensuring a **sustainable water supply** meets the needs of people, agriculture, energy, industry and the environment within the limits of availability.
- By providing a system for **equitable allocation of water**, based on available supply, the application of environmental flows can **support development** and **poverty alleviation**.
- EFA provide the **tools** and **the data** necessary to help support **decision-making processes** which focus on poverty reduction contributing to wider national development activities.
- The **concern over environmental degradation** and the **implementation of IWRM** is **establishing the environment as a legitimate water user**.



Assessment of environmental flows

- EFs estimation needs the understanding and quantitative data on **relationships between river flows** and the **multiple components of river ecology**.
- The **major criteria for determining EFs** should include the **maintenance of flow variability**, which affects the **structural** and **functional diversity** of rivers and their floodplains, and which in turn influences the **diversity of aquatic species**.



Components of the Flow Regime

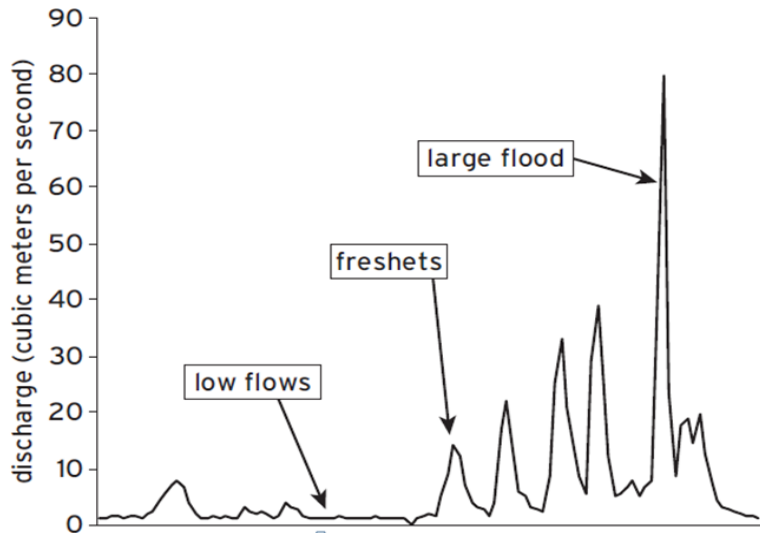


Fig. River flow regime and its variability

Different ecosystem functions are maintained by different components of the flow regime.

- *low flows* - maintain the connectivity of pools and provide for longitudinal movement along the river;
- *small flood* - more frequent floods (known as freshets) can trigger spawning in some species and may remove detritus; and
- *larger flood* - more infrequent floods can water floodplains and provide lateral movement of sediment and nutrients to and from the floodplain.

Environmental Flows for sustainable rivers flows management in the WIO

- The **mainstreaming of EF into IWRM** is now a reality to some of the WIO Region countries **as provided in their policies and legislations** - South Africa and Tanzania have been in the forefront within the WIO Region.
- Tanzania has recently implemented environmental flows in preparations of **IWRMDP** for its hydrological basins using varied approaches – varying from simple hydrology-based look-up tables to complex holistic methods.
- Also, a **harmonized EFA guideline** is in place – based on experiences from the 5 hydrologic basins assessments.



Some lessons for successful EFA implementation

- **Adoption and implementation** requires that **EFs are incorporated into Water policies and national legislation.**
- They must include **mechanisms for negotiated consensus on flow allocation among all stakeholders** → **develop a shared vision on the interdependencies of water, food, and energy, resulting in flows for multiple benefits.** And, **realizing the full benefit requires coordination of stakeholders** at the different levels including the grassroots level.
- It requires **paradigm shift from traditional systems based on command and control to an incentive-based system** with major drivers on maintaining EFs, **stakeholders' participation** (*responsibility, ownership, accountability, participation and use of local knowledge*) and use of modern and emerging technologies in water and catchment management.



Some lessons for successful EFA implementation cont..

- Implementing EFs requires **adaptive management**, based on a **'learning by doing'** approach. **Flexibility is required to effectively negotiate the objectives and outcomes of environmental flows.**
- **Effective implementation of EFs** can help to achieve the **wise use of catchments and natural resources** and contribute to all SDGs, particularly SDG 6, 14 and 15.
- Implementation of Policy needs **political support**
- Need to **establish clear public benefits** from Eflows water



Recommendations

Technical recommendations:

- *There is need to **compile a status report on experiences** in the **application of EFlows** across the WIO region to **promote shared learning**.*
- **Policy recommendations:**
 - Contracting parties need to consider incorporating EFlows in IWRM legislation and regulations.*
 - There is need to apply a regional EFlows Assessment Guideline to harmonize approaches and application of this tool in IWRM.*



- Finally,

The success or failure to mainstream EFs in water management will depend on whether it has a place in national legislation (*IUCN, Managing Water Allocation and Trade-Offs*)”.



Thank you very much for your
attention

