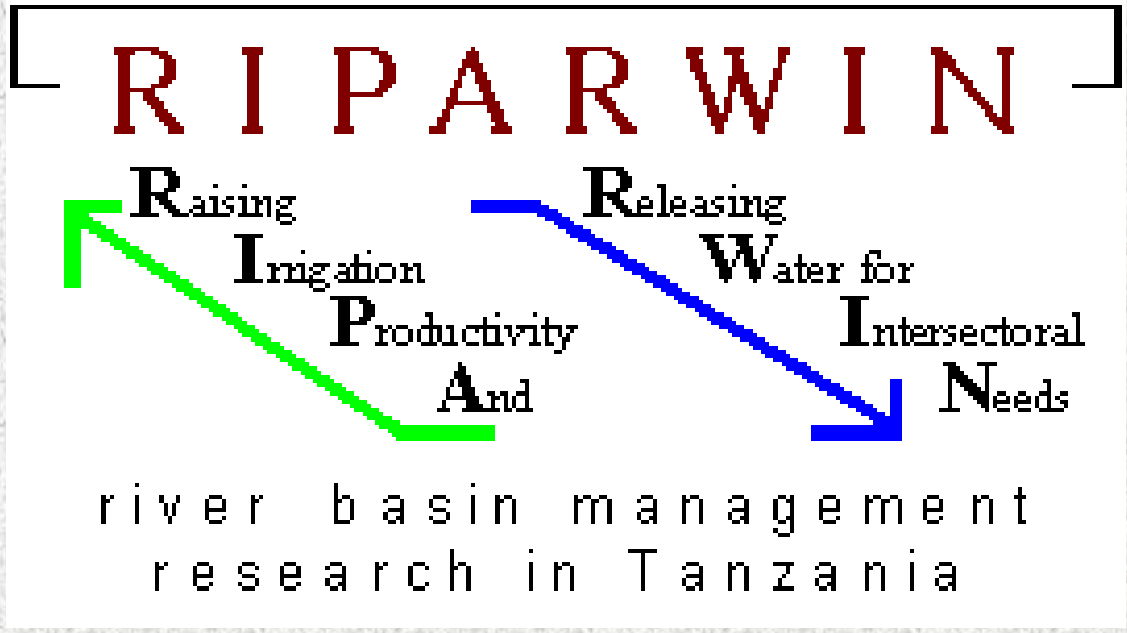

A study of the science of river basin management

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SUA/MOROGORO

DFID Department for International Development

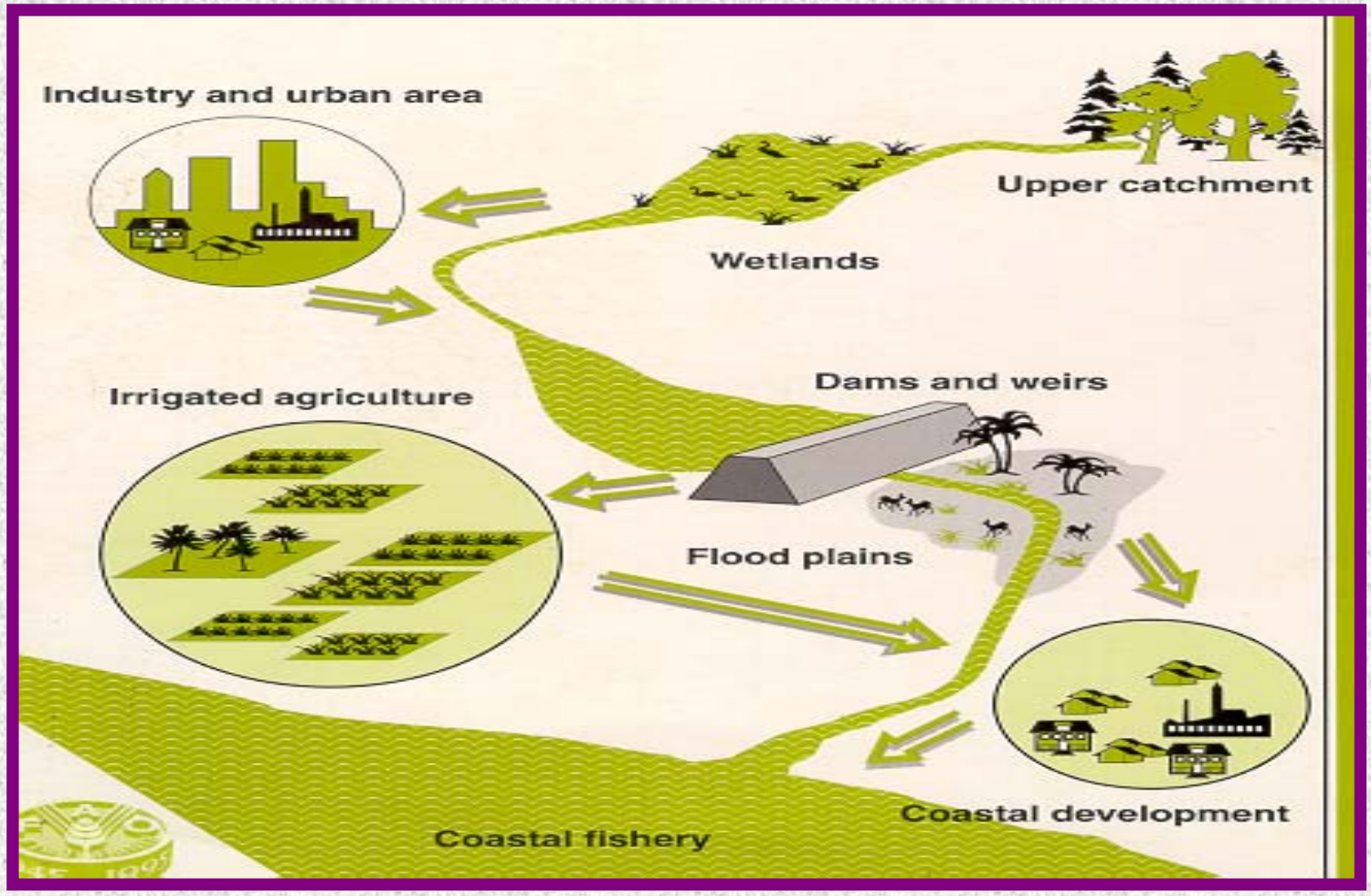
ODG DEV

IWMI International Water Management Institute

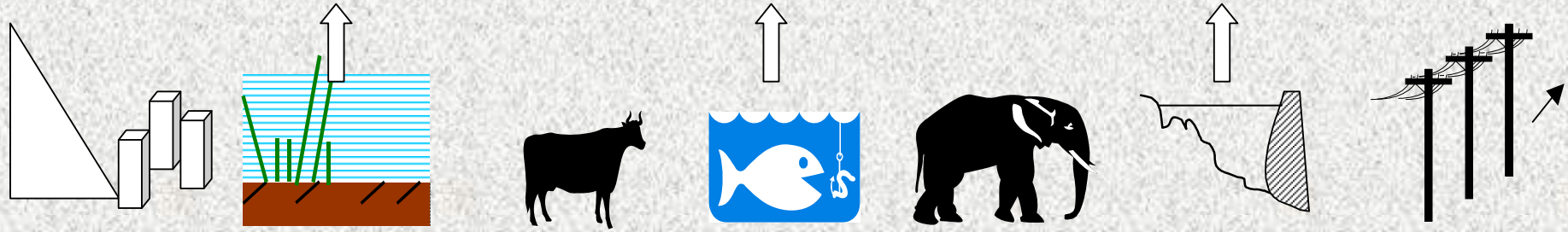
A DFID-funded research project implemented by SUA, supported by the University of East Anglia, & International Water Management Institute (IWMI)

- Based at MATI Igurusi (Mbarali, Mbeya)
- Run from 2001 till March 2005
- involved 17 researchers including 6 PhD's
- Key partners were: RBWO, MOWL, WWF, MAFS, ZIO

Adopted the River Basin Approach



The Sectors



Slopes & rainfed maize	**Domestic users**; e.g. cooking,	**Irrigated agriculture**; rice with evaporation	**Livestock** keepers; watering and grazing on seasonal/ permanent wetlands	**Usangu wetland;** fisheries; livelihoods	**Ruaha National Park**; fish, river ecology; wildlife	**Mtera/Kidatu HEP stations;** power generation; evaporation	Power to urban centres; industry; lighting,
	Minor needs	Water savings required here	Minor needs		To give water here	To give water here	

RIPARWIN: PURPOSE

- Benefits for poor people, the environment and other river basin stakeholders increased by application of new knowledge to the enhancement of productivity of irrigation and transference of water to meet other needs

RIPARWIN: OUTPUTS

FIVE Outputs dealing with:

- **Enhance understanding of:**

1. **Water management**, competition, use and irrigation productivity
2. Water **demands** of **other sectors** (e.g. environment, domestic and livestock) and users (net and gross)

3(a) Means and **potential** to **transfer** water between uses and sectors

3(b) **Impacts** arising from **water transfer** away from irrigation, particularly on poor people

4. River basin **characteristics**, allocations means, risks and typologies through production of a **River Basin Management Decision-Aide**
5. Enhance **capacity** in **irrigation** and **water management** within a **multi-sectoral** environment

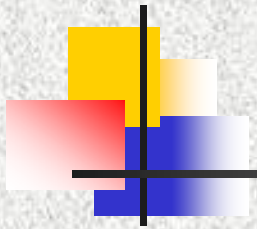
Conditions studied

- Water use and types
- Irrigation types and management
- Climatic and seasonal variability
- Social differentiation
- Sub-basin variability

RIPARWIN adopted a Multiple Studies Approach

Studies conducted by RAs

1. Formulation of a river basin management decision-aid to examine trade-offs of various water allocation scenarios (RUBDA)
2. Irrigation efficiency and productivity studies
3. Evaluation of Livelihood and Economic Benefits of water Utilization in the Great Ruaha
4. Hydrological Analysis of the Great Ruaha
5. Assessment of Hydrological and Production Roles of Wetlands in Usangu Plains
6. Evaluation of Institutional and Legal Frameworks for Water Resource Management in the River Basin



RIPARWIN addressed a range of research questions

Irrigation efficiency & productivity

- What are the current uses and productivity of water?
- Is there a potential for improving productivity?
- What is the potential for real saving of water and what are the broad linkages?
- What is the current management of the different systems?
- What are the means for saving water?

Livelihoods & economic benefits

- What is the typology of water users?
- What are the impacts of saving water?
- What are the benefits from the current uses?
- What are the livelihood strategies?
- What are the impacts of water saving and transfer on social economic and livelihood strategies?

Hydrological Analysis and Decision Aide

- What are the water needs of other sectors/stakeholders/users (current & future)?
- What are the options for meeting current & future demands?
- What are the risks associated with the options?
- What are the means of implementing the options?
- What is the water resource base (including ground water)?
- What are the dynamics of hydrology?

Institutional and legal frameworks for WRM in the basin

- Which institutions focus on the interest of poor people?
- Are these institutional adequate?
- How do institutions react to changes, impacts and risks?
- What are the feedback mechanisms into sustainable institutionalization?
- How do users allocate water between uses and sectors?
- What are the river basin institutional relations ?
- What would be the appropriate design of institutional arrangements ?

Hydrological & production roles of wetlands

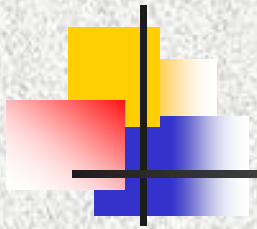
- What is the extent of intermediate wetlands?
- What are the necessary minimum flows and routing requirements for the environment?
- What are the multiple uses and benefits?
- What are the means for maintaining minimum flows?
- What is the history of wetland development?
- What are the hydrological relations of wetlands – especially with groundwater?

SSI Management

- What are the management of water systems in traditional irrigation?
- How do users decide how to allocate water to other uses in the irrigation systems ?
- What are the impacts of interventions made to-date?
- What would be appropriate interventions ?
- What are the socio-technical issues of importance?
- What are the appropriate farmers level institutions and formation process?

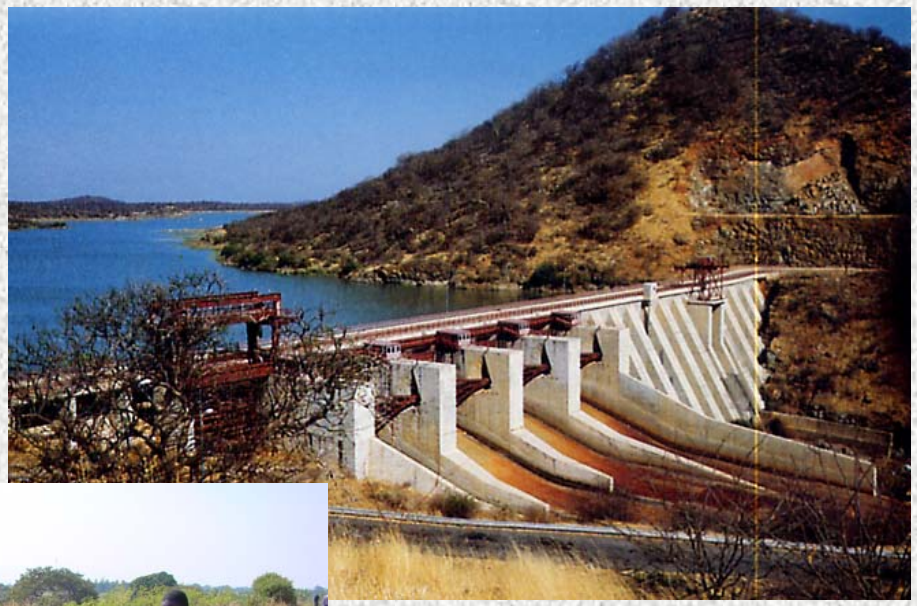
Dissemination & output's

- Website, http://eng.suanet.ac.tz/swmrg/Riparwin.htm
- Articles, information sheets & policy briefs
- Over 20 journal papers
- Several Working Papers & Research Reports (IWMI)
- Several conference papers and posters (WATERNET, Waterdome, SA; Dialogue in Vietnam; presentations in UK, Water Week in Stockholm, etc.
- Global Water Partnership toolbox, etc.

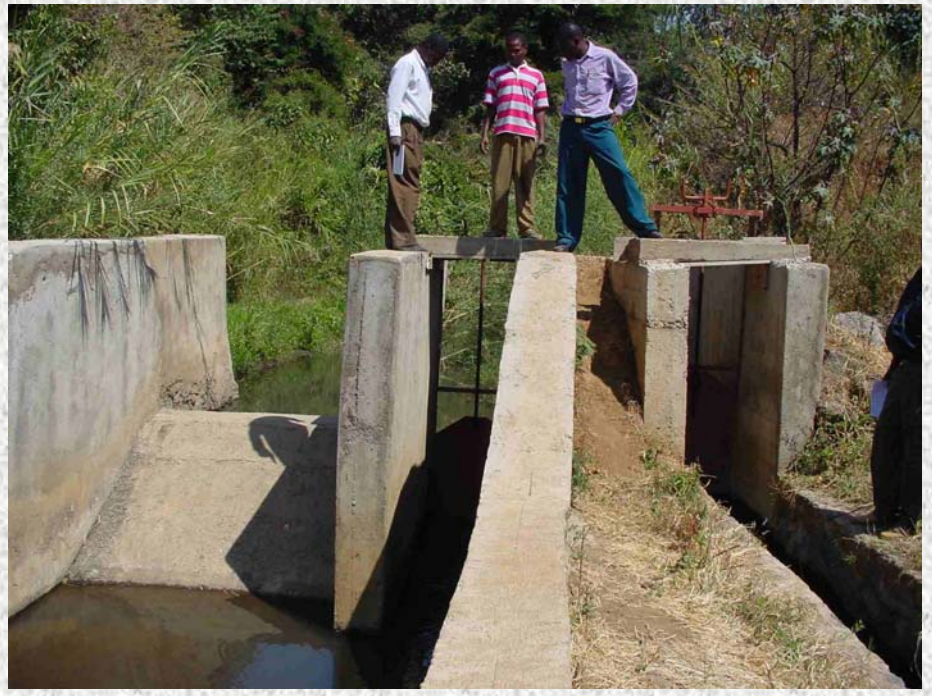


Some lessons

- *Water – a fundamental driver of adaptation to CC in Rufiji basin*



- *Demand-side management took second place to SS-side solutions*



Inefficient water uses in most schemes

- *In 2002/03 irrigation schemes in the upper zone abstracted **962 mm** of water Vs **435 mm** (twice as much of what is required to grow a 120-days maize crop during the dry season)*

- Abstraction in the middle zone:
  - ***3161 mm*** *Vs* ***521 mm*** *(6 times more of which is required to grow the same maize crop)*
  - ***3.35 l/s/ha*** *instead of* ***1.68*** *(twice as much) required to grow rice*

- Low water productivity (WP)
  - ***Low*** *(**0.20 kg/m³** for rice in the UGRC)*
    - *Generally low for SSA **0.10** - **0.25** kg/m³*
  - *Compared with China & some South-East Asian countries which have higher WP for rice (**0.4** - **0.6** kg per m³)*

- *Low water use efficiency*
- *Most irrigation schemes (120 of 150) are traditional*
  - *Lacking water regulating and measuring structures in most irrigation canals*
- *Over-allocation of water - in 7 out of 12 rivers studied during the dry season in 2003 and 2004 – water allocation > water availability (river flows)*

Role playing via a River Basin Game - Facilitation of local decision-making

- *Some improvement in AWM – but in very isolated cases*
  - *Improvement in water use efficiency (esp. in FFS plots)*
  - *Rice yields have doubled for some – **not all***

For some farmers – it is still the "same old game" (Why?)

- *Resurgence of water recharges in sources which were completely dry*
- *Increase in dry season water flows for the GRR (Nyaluhanga gauging station) from **0.6 m^3/s** before 2004 to **more than 1 m^3/s** in 2008*

Conclusion

Scaling up of "success stories"

- *A complex reality requiring:*
  - *Concerted reactions & commitment*
  - *Adequate support by the government & development partners*
- *Entry point:*
  - *Identify "quick wins"& strategic priorities*
  - *Use achievements on these as a measure of real progress & commitment*
  - *Research to inform decision making*

Thank You Very Much for Listening