


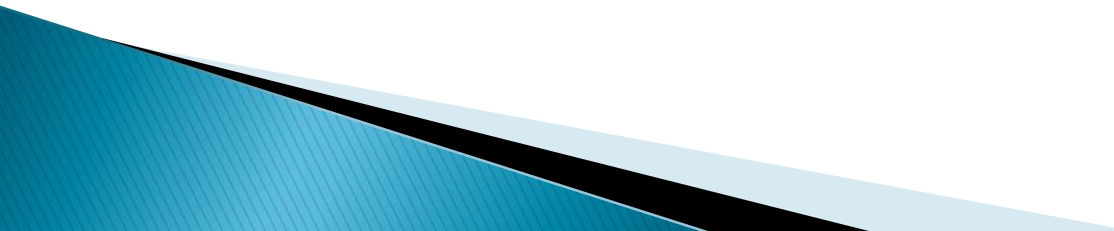
Groundwater regulation, licensing, allocation and institutions for transboundary aquifer management

Dr. Callist Tindimugaya
Steering Committee Member, AGWNET
Africa Water Week, Dar es Salaam
20 July 2016

Learning Objectives

- Understand the rationale and benefits of groundwater regulation;
 - Create awareness about the benefits of a groundwater licensing and allocation system;
 - Appreciate how a groundwater licensing and allocation system may be implemented;
 - Understand typical institutional arrangements for integrated groundwater management
- 

Why regulate groundwater

- Regulate groundwater **development**
 - Constrain activities that might compromise groundwater **availability** and **quality**
 - Address increasing **competition** and conflict between groundwater **users**, and
 - Address increasing **threat** of groundwater **pollution**
- 

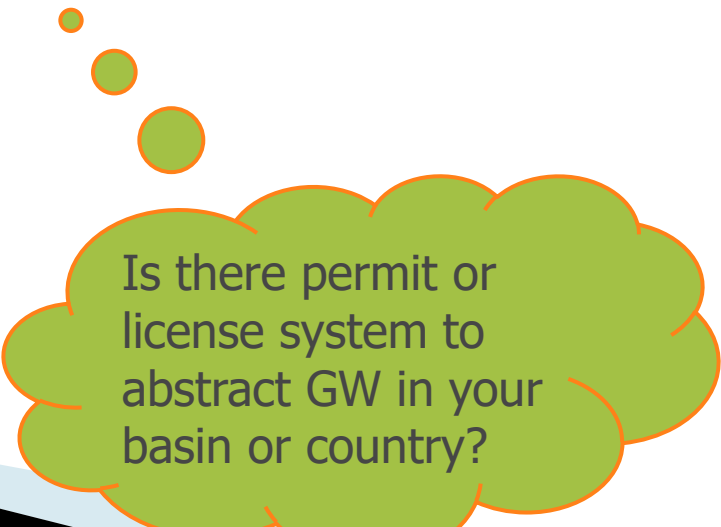
Specific legislative provisions in groundwater regulation

- ▶ Groundwater Abstraction Permits
- ▶ Wastewater Discharge Permits
- ▶ Sanctions for Non-Compliance
- ▶ Drilling Permits/Controlling Well Construction Activities
- ▶ Catchment or Aquifer Level Resource Planning
- ▶ Conjunctive Use of Groundwater and Surface Water
- ▶ Land Surface Zoning for Groundwater Conservation and Protection
- ▶ Facilitating Water-User and Stakeholder Participation
- ▶ Provisions for Groundwater Monitoring

In general terms, groundwater regulation must be flexible, enabling and enforceable

Water... a public ownership

- ▶ The responsibility of the government
- ▶ A 'water right' = *the right to use (...not ownership of) water*
- ▶ Granted under certain terms or conditions
→ through permits, licenses, concessions or authorizations...



Is there permit or license system to abstract GW in your basin or country?

Why groundwater licensing?

- ▶ Reduce interference between abstractions wells
- ▶ Avoid conflicts and disputes over water use
- ▶ Foster the participation of water users;
- ▶ Improve economic efficiency;
- ▶ Implement groundwater demand management
- ▶ Collection of abstraction charges
- ▶ ...



Does GW licensing guarantee a given water quantity/quality?

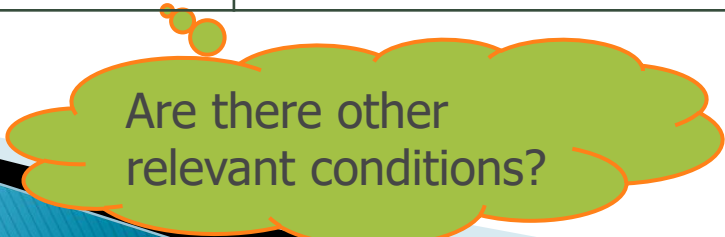
Requirements for a good groundwater licensing system

- ▶ Comprehensive and unified, covering both GW & SW
- ▶ Sufficient detail to minimize conflict between users
- ▶ Specify conditions under which groundwater is abstracted: time, rate, the volume,... the priority in case of scarcity
- ▶ Appropriated judicial or review mechanism to enable affected users to question and to challenge decisions.



Examples of permit conditions

TERM OR CONDITION	COMMENTS
● duration of right/permit	This requires flexibility but ranges between 1 to 5 years
● points of abstraction and use	These need to be specified as they may vary
● purpose of use	Important to distinguish consumptive and non-consumptive use
● rate of abstraction	This needs to be specified as it is the basis of compliance monitoring and also charging fees
● specification of works	Details of depth, diameter, completion, sanitary protection, etc need to be stated.
● environmental requirements	These deal with any provisions needed to protect the resource or ensure no adverse environmental impacts are caused by groundwater use under the permit
● Permit Fees	Fee are usually paid for using the water under the permit
● record of transactions	obligation to declare and submit information on groundwater use and any other information collected as part of the permit
● loss or reduction of right	forfeiture without compensation for non-use or non-compliance
● suspension or cancellation of right or permit	Indicates the circumstances under which the permit may be suspended or cancelled. as a penalty or in emergency without compensation
● review of right/permit	States the needed periodic adjustment with compensation according to supply/demand
● renewal of right/permit	States requirements and conditions for renewal of the permit



Are there other relevant conditions?

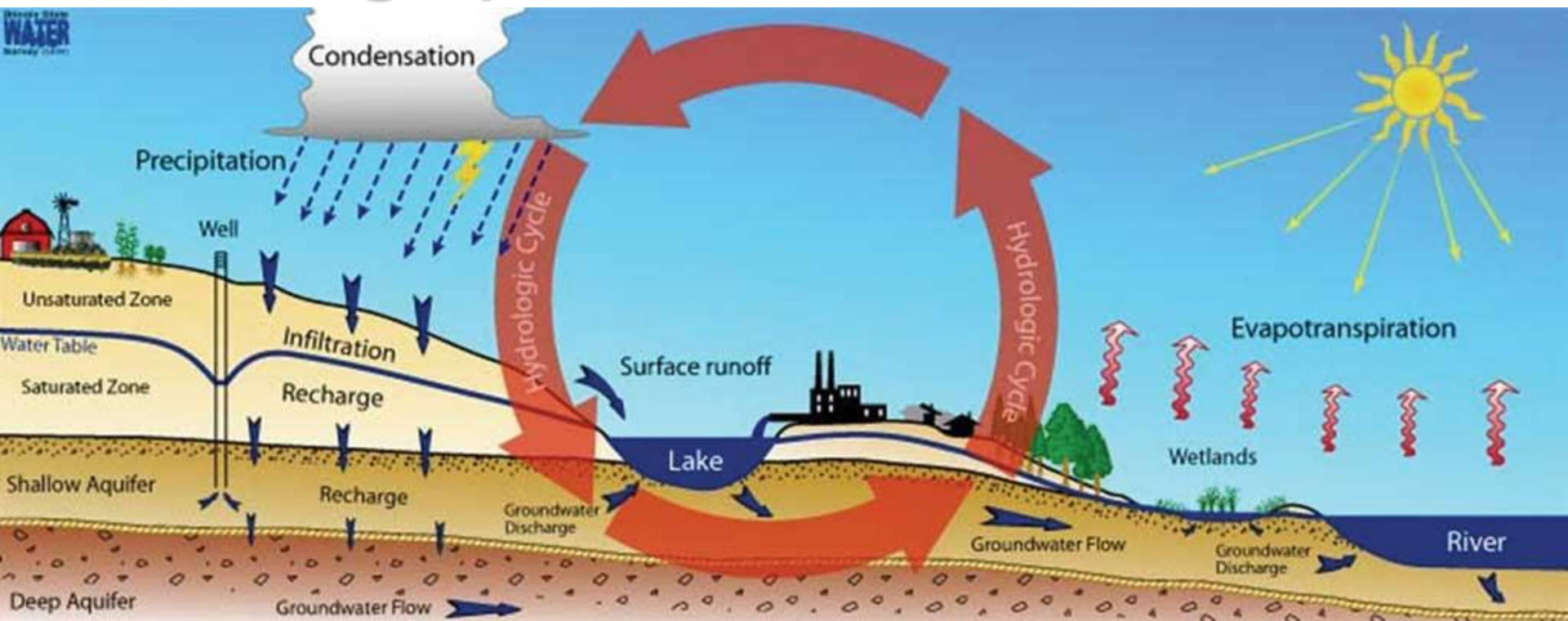
Groundwater allocation criteria

- ▶ Allocation objectives should be clear and include economic, social and environmental factors
- ▶ Criteria
 - Flexibility to allow reallocation
 - Security of tenure of users
 - Predictability of outcomes of allocation process
 - Equity
 - Political & public acceptability
 - Efficacy → changes existing undesirable situation
 - Administrative feasibility and sustainability.




Are there other criteria ?

Administration of a groundwater licensing system



- ▶ Interactions between ground and surface water;
- ▶ Important issues: level of surface water connection (how much, which bodies, over what period?, is third parties affected?), is baseflow/ecosystem/springs affected?

Administration of a groundwater licensing system– special considerations (cont.)


- ▶ Technical considerations
 - Groundwater quality concerns
 - Resource replenishment
 - Dual purpose of some wells
 - ▶ Managerial considerations
 - Well drilling trade
 - Flexibility in water allocation
 - Groundwater conservation areas
 - Transboundary aquifers
- 

Points to be considered


- ▶ Stakeholder participation leads to better compliance;
- ▶ Transparency to allocation process is enhanced by availability of an information system;
- ▶ Monitoring of water use and water resources is key to water allocation enforcement
- ▶ Effects on third parties, watercourse baseflow, environmental ecosystems, and sustainability of springs ;
- ▶ Political and public awareness.



Implementation tools

- ▶ **Planning instruments**– spreadsheets of water users and polluters, aquifer quantity and quality models etc
 - ▶ **Management guidelines**– procedures for receiving, assessing, and approval of applications
 - ▶ **Information system**– to manage applications, permits issuance, monitor user compliance, and provide information for use in enforcement
 - ▶ **Public education**– to raise political and public awareness
- 

Key priorities issues for regulatory and enforcement agencies


- Sufficient staff of adequate capability to enforce regulations and make appropriate assessments
 - Laws which are practical and enforceable
 - Staff who are knowledgeable about good management practices and have appropriate scientific knowledge
 - A sense of ownership on the part of stakeholders
 - Adequate financial resources to support staff and operations
 - Selecting meaningful indicators for technical, economic and social issues and appropriate benchmarks
 - A programme of legal education and awareness building
- 

Most important actors

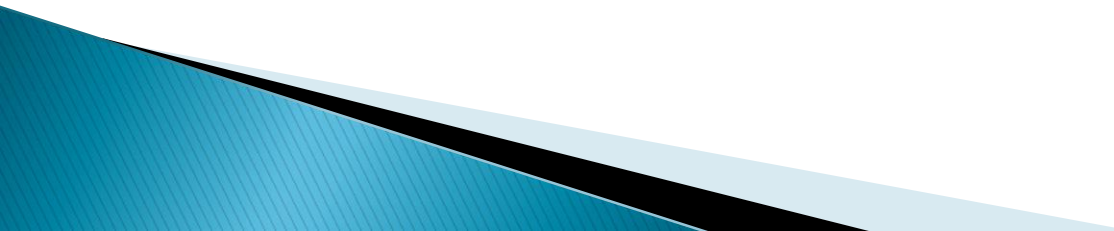
- ▶ *Holder of a water-use permit, a lawful user who ... has to pay fees and charges .*
- ▶ **Other users** in the same aquifer and its dependent surface water.
- ▶ Other *stakeholders*, third-party actors.
- ▶ The *water resource authority*:
 - can deny or grant water right/permit
 - Should keep records and monitor compliance through field inspections and other means
 - Impose warnings, sanctions or seek prosecution in case of non-compliance
- ▶ The **judiciary** may prosecute or hear appeals

Management style involving working with users

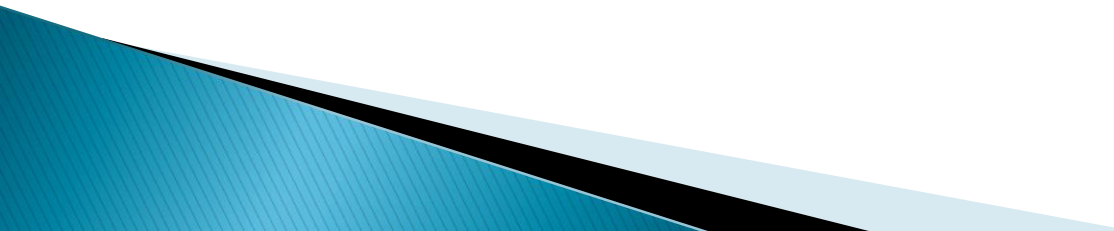
Achieved by ensuring that;

- ▶ Conflict resolution mechanisms are **well-accepted, economic and rapid**
 - ▶ Sanctions balanced to **discourage non-compliance** ... not to cripple water users
 - ▶ Monitoring **realistic** and commensurate with institutional capacity
 - ▶ **Record keeping** procedures ensure complete copies are available
 - ▶ **Water authority discretion** limited to reduce bureaucracy
 - ▶ **User bribery and administrator corruption** dealt with decisively
- 

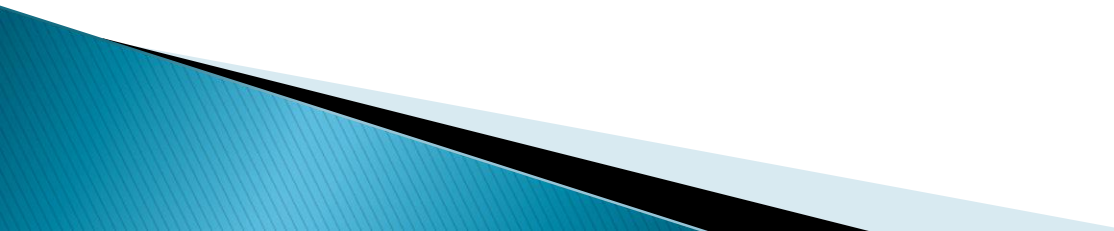
Guidelines in transitional phase

- ▶ If no accurate data on GW balance, all users should be given permits of short duration
 - ▶ Customary rights should be dealt with comprehensively.
 - ▶ No exceptions should be tolerated.
 - ▶ Specification of abstraction rate thresholds, a dynamic process.
 - ▶ Certain minor uses may be exempted from water license bureaucracy.
- 

The case of non renewable groundwater resources

- ▶ Implementation of a licensing system→ high priority.
 - ▶ Consistent with the hydrogeological reality.
 - ▶ Permits need to be time-limited, and subject to initial review and modification after a few years.
 - ▶ Take advantage of results of operational monitoring to take decisions
 - ▶ **Transboundary aquifers:** need for harmonization of legislation, regulations and licensing system
- 

Non renewable GW: special consideration needed

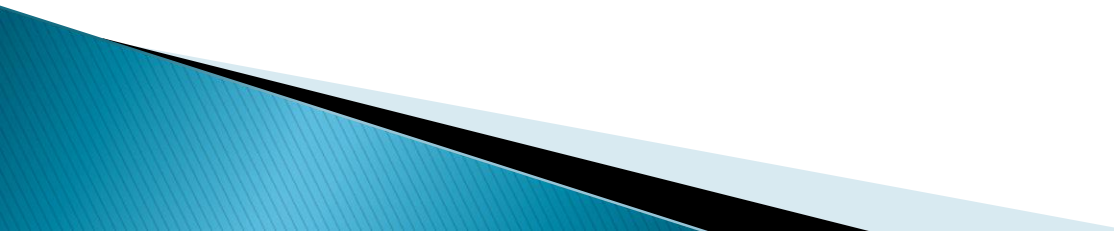
- ▶ Impacts of new water allocation on traditional users
 - ▶ Ensuring that sufficient water of acceptable quality is left in aquifer
 - ▶ Difficulties in estimating impacts on ecosystem
 - ▶ Considering the “what happen after” question and identifying and costing probable exit strategy
 - ▶ Envisaging re-use of urban, industrial and mining water supplies and carefully controlled agricultural irrigation
- 

Institutional challenges

- ▶ Inadequate groundwater management boundaries,
- ▶ Weak regulatory enforcement,
- ▶ Lack of social consensus,
- ▶ Poor inter-institutional coordination

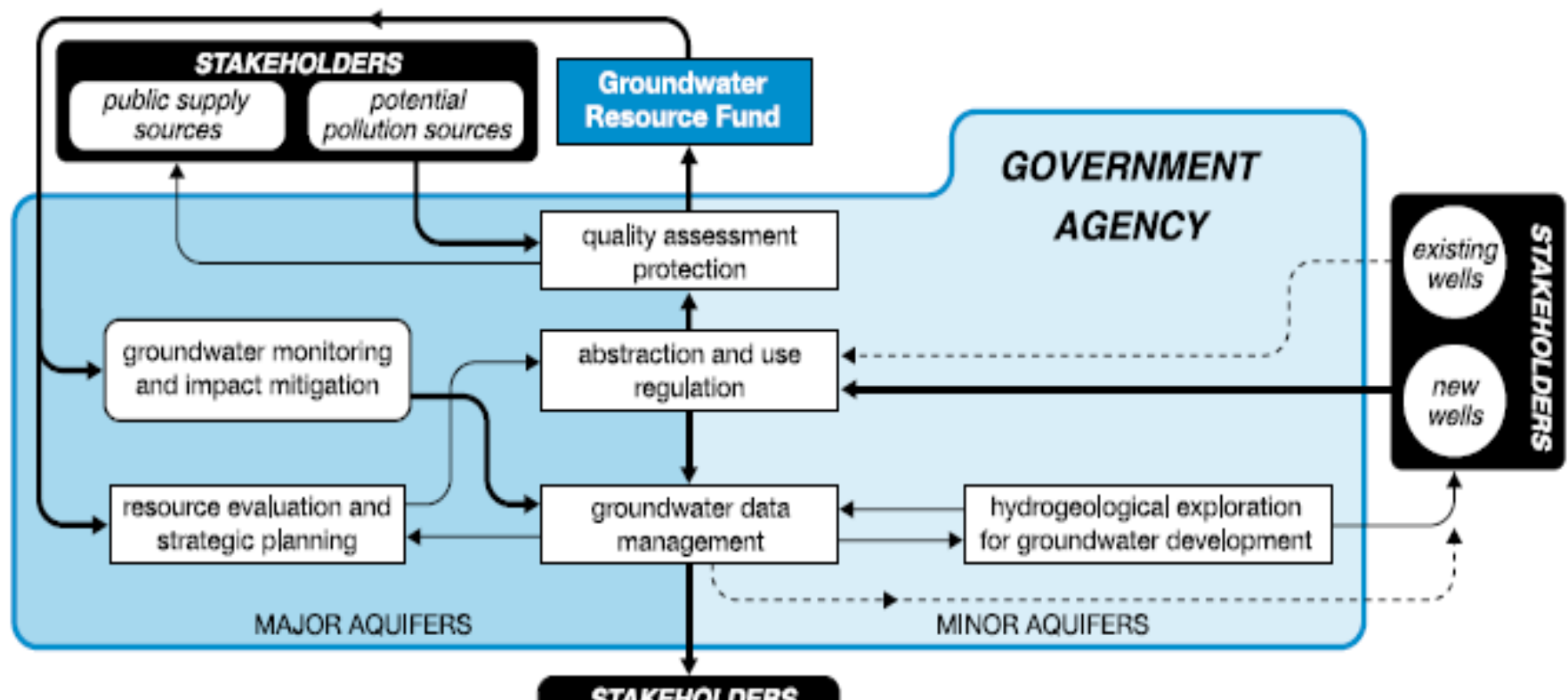
Institutional arrangements for GW management

Groundwater regulation requires:

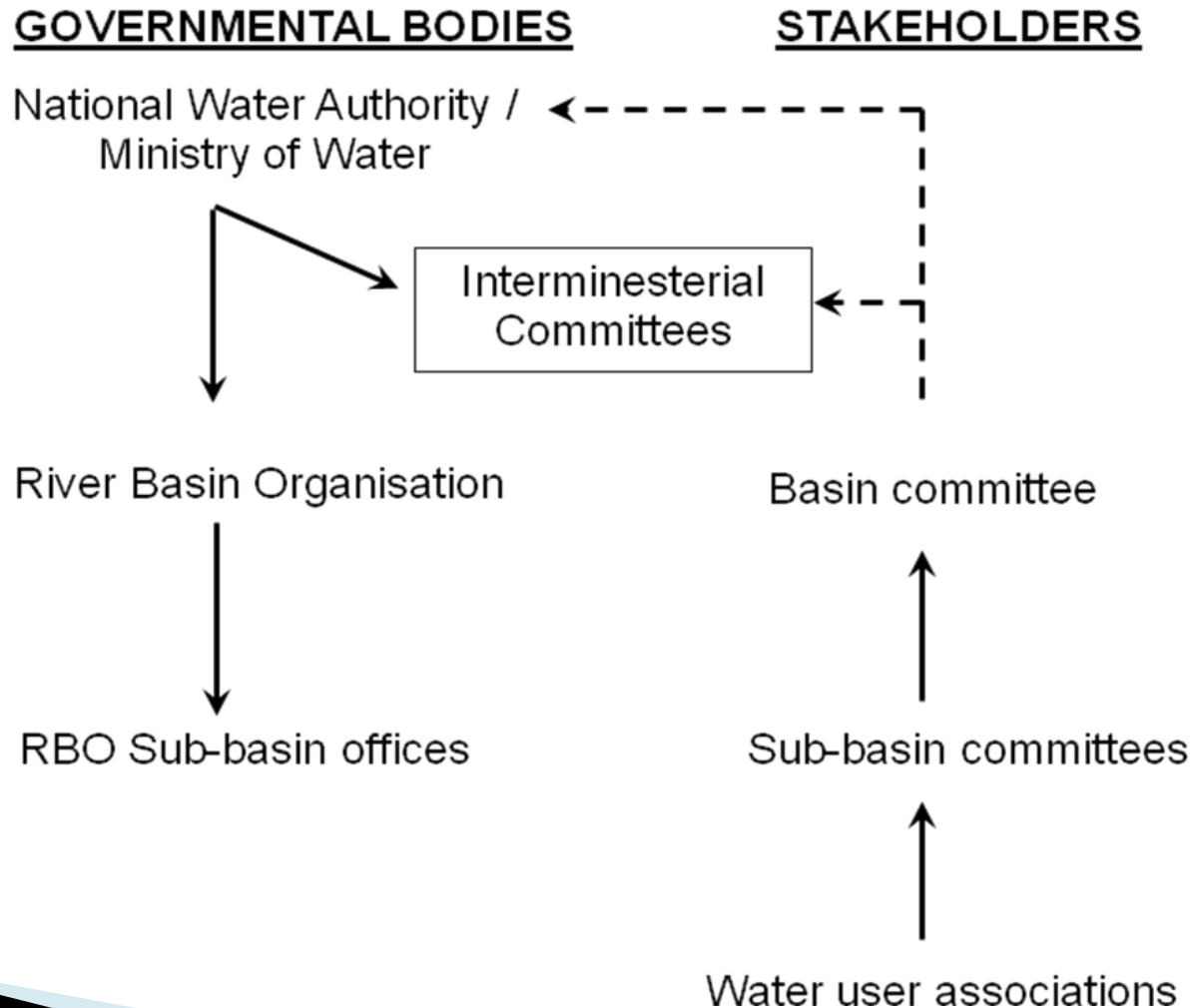
- An administrative set-up and the level of training of water administrators
 - A clear understanding of the institutional roles and functions at all relevant levels
 - An adequate level of public awareness and acceptance of legal provisions
 - Political willingness to promote and attain sustainable groundwater management.
- 

Institutional arrangements for GW management

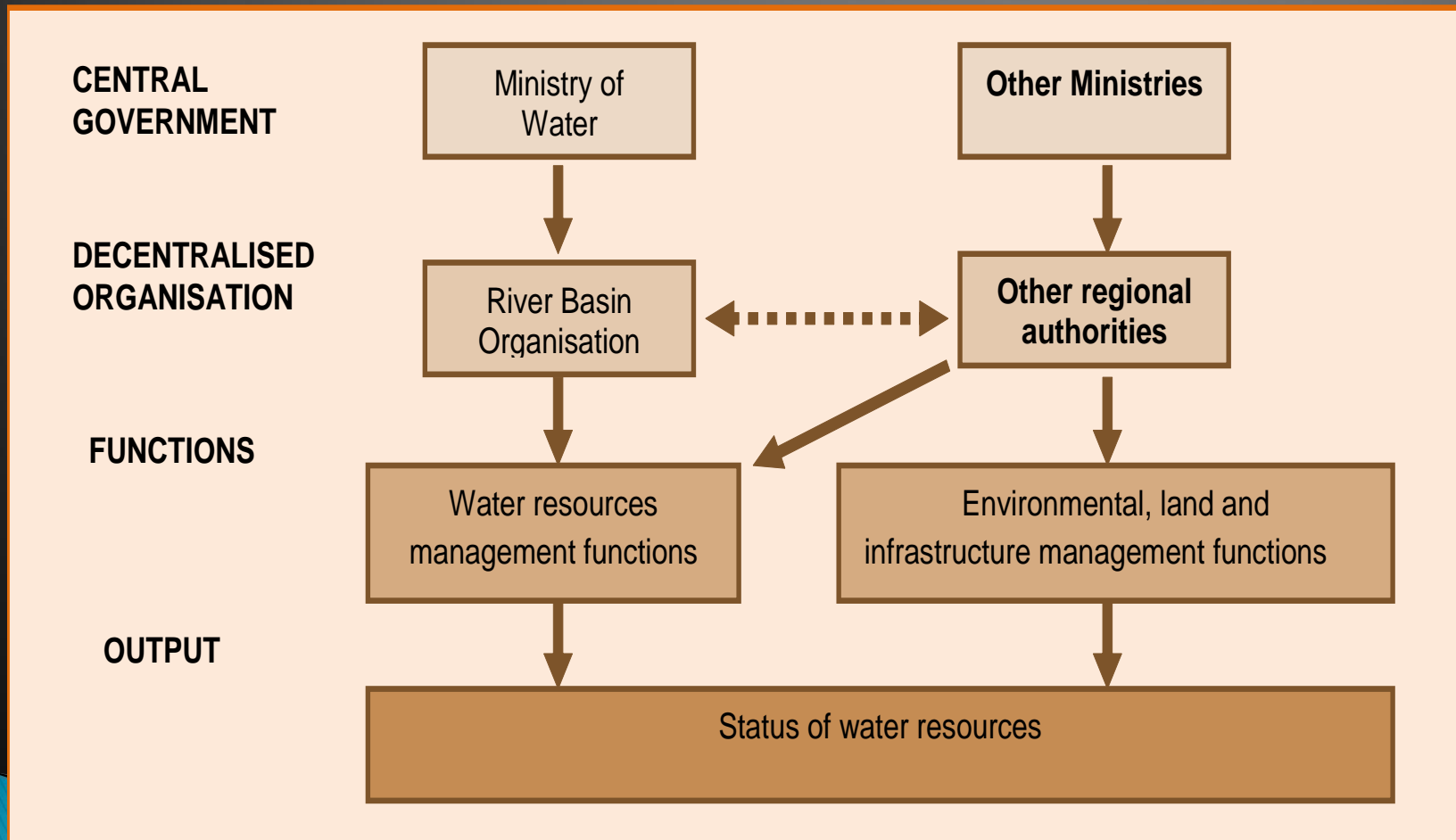
The essential role for government agency in the management process



Institutional arrangements for GWM



Institutional arrangements for IWRM at River Basin Level



Exercise

Duration: 45 minutes

Purpose

- ▶ To share experiences on groundwater regulatory systems and implications for transboundary groundwater management

Activity: break into two groups and discuss groundwater regulation and allocation systems in your various countries and mechanisms of enforcement and address the following issues:

- How effective is regulation of groundwater
- Is groundwater regulation part of surface water resources legislation or separate
- How should groundwater regulation be undertaken within a river basin organisation? Indicate roles of countries and river basin organisations