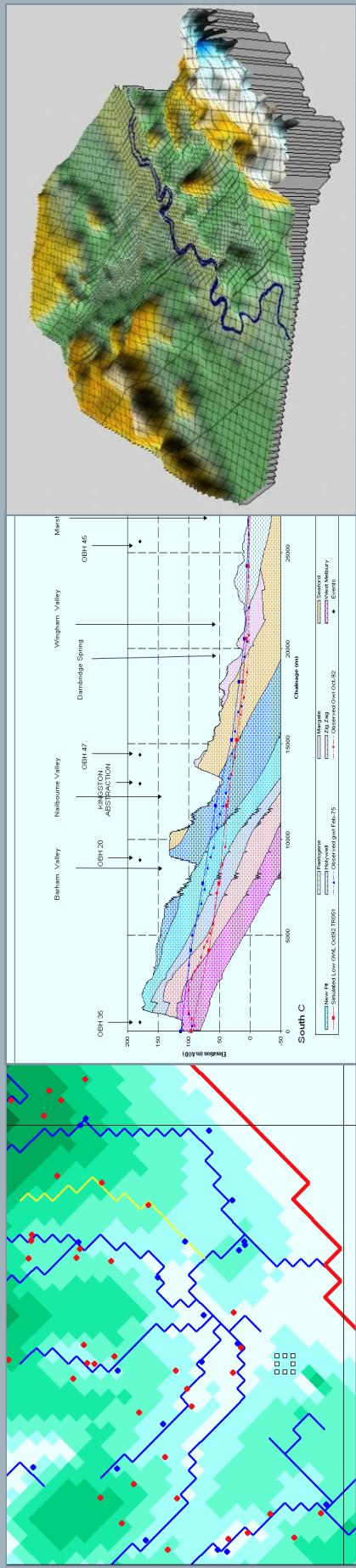


Groundwater Management in the UK The Importance of an Integrated Approach



Jan van Wonderen – Mott MacDonald



Overview of Presentation

- Role of Groundwater in England
- Demands for Groundwater
- Regulation in England and Wales
- Integrated Approach to Water Resources Management
- Resource Assessment Tools
- The Importance of Stakeholder Participation

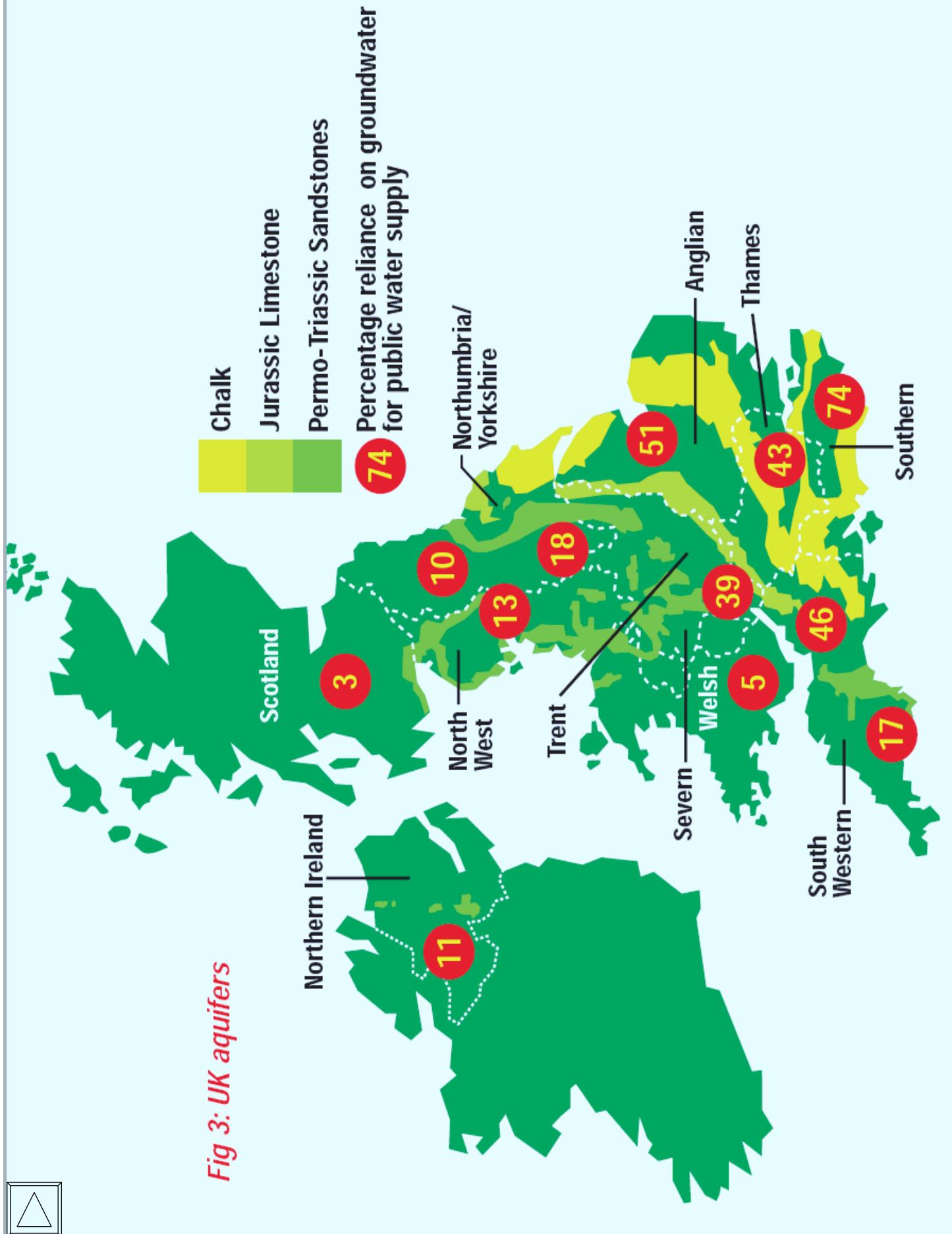


The Role of Groundwater in England

- Depending on availability: a significant and sometimes the only source for PWS and agriculture
- Provides baseflow to rivers, wetlands and marshes
- Aquifers can act as reservoirs for artificial recharge and recovery and thus become strategic reserves



Fig 3: UK aquifers



 as an environmental resource – groundwater influences river flow and quality, and sustains fresh surface waters, wetlands and marshes.

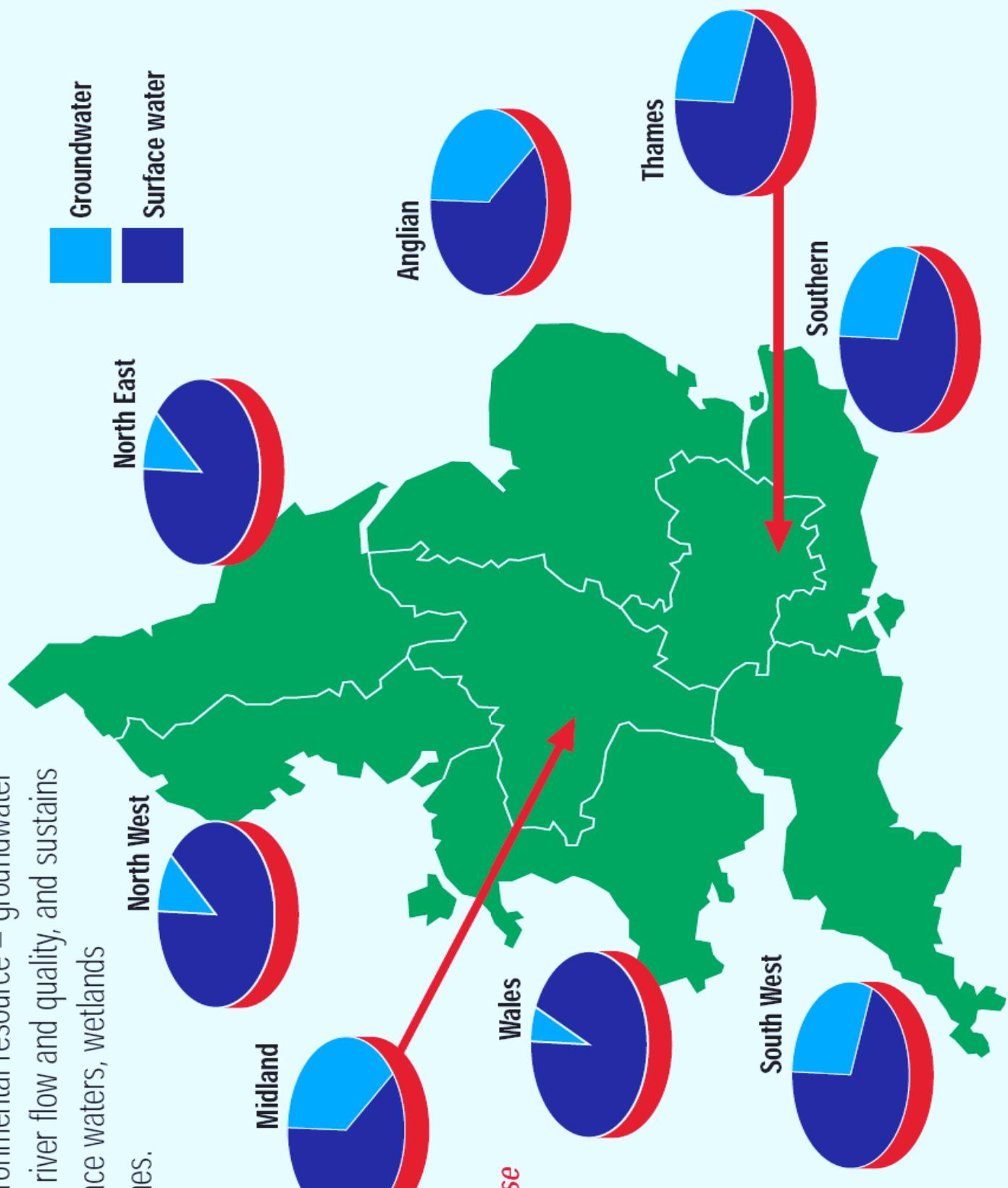


Fig. 2:
Groundwater use
in England
and Wales

Demands for Groundwater

- Conflicting demands?
 - Public water supply – growing demands (population growth)
 - Agriculture – growing demands (agro-industry)
 - Environment – growing demands (regulation)
- Demands are highest during summers and droughts
- Satisfying demands for PWS and agriculture compromises the environment:
 - Rivers and springs running dry
 - Wetlands drying out
 - Irreversible threats to the ecology of rivers and wetlands
 - Saline intrusion in coastal areas



Regulation

- Historical Context
- Decision Making:
 - Groundwater Resource Planning
 - Operations
 - Groundwater quality
- Groundwater Legislation (EU Directives)
- Close links with stakeholders





Water Authorities (WA)

These authorities were regionally based and combined regulatory with water services duties.

In 1989 the water authorities were split into water utilities and into the regulatory body, the National Rivers Authority (NRA).

There was a split in the staff base with movement into regionally based NRA offices.

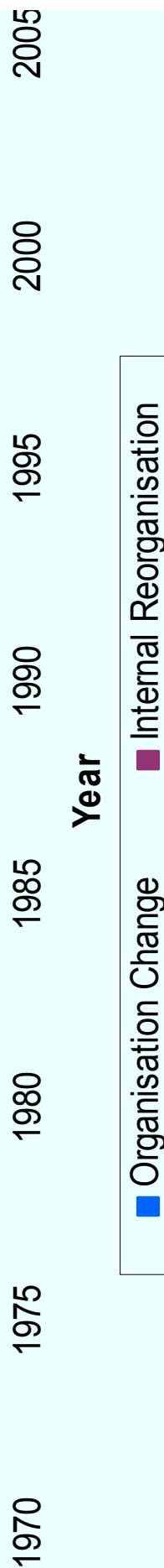
The split caused a significant loss in experience, felt more in some regions than in others.

National Rivers Authority (NRA)

The split in the staff base following the split up of the WA caused a significant loss in experience, felt more in some Regions than in others.

Environment Agency (EA)

The functions of the NRA were incorporated into the Environment Agency following the 1995 Environment Act.



■ Organisation Change ■ Internal Reorganisation

Decision-Making: Planning

- Water Framework Directive
- Water Resources Strategy (GW Balances)
- CAMS (RAM Framework)
- Water Company Water Resources Plans
- Restoring Sustainable Abstraction
 - Habitats Directive Review of Consents
 - National Environment Programme
- Groundwater Scheme Review/Design
- Drought Plans
- Strategic Monitoring Network Design



Options Appraisal

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Decision-Making: Operations



- Abstraction Licensing
- (Strategic licensing issues)
- Water availability forecasts
- Operation of mitigation schemes
- Operation of groundwater schemes

Decision-Making: GW Quality

- GPZs
- NVZs
- Contaminated land
- Groundwater regulations



International treaties
Ramsar Convention 1971

EU Directives
Birds Directive 1979 (SPA)
Habitats Directive 1992 (SAC)

Acts of Parliament

Water Industries Act 1991

Wildlife & Countryside Act 1981

Ofwat

Regulations
Conservation
(Natural
Habitats etc)
Regulations
1994

Environment
Agency

Water companies

Natural England



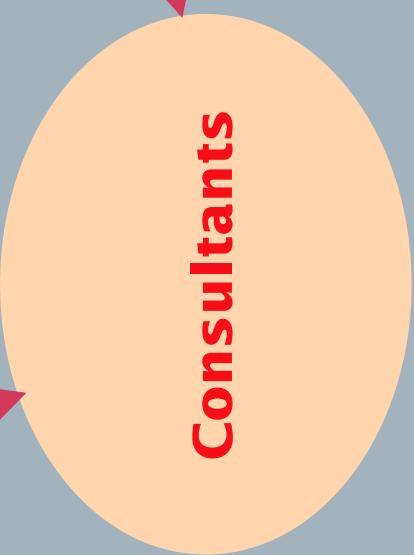
The days of old



Limited
communication?



Conflicts over
decision making?



Who do we work for?



An integrated approach

Benefits to all involved

Consultants

Working closely
together

Water Users

Regulatory Teams

Good
understanding
of each other's
needs

A relationship of
common
understanding
and consensus on
decisions



Integrated Water Resources Management - IWRM

Definition of IWRM

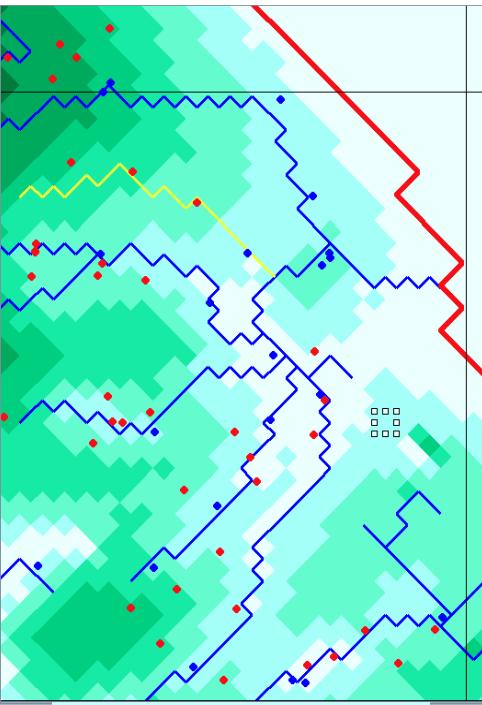
IWRM is a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems



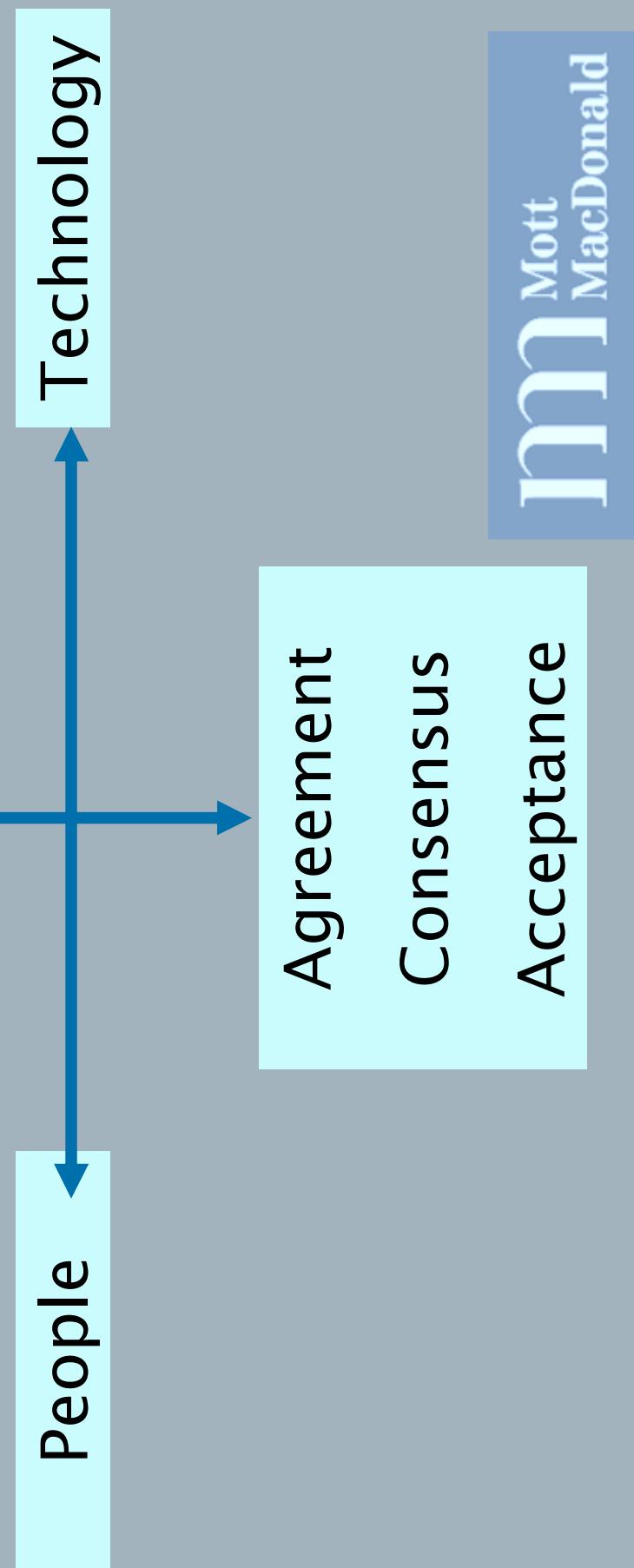
'Integration' in IWRM

- Natural and human system
- Land and water management
- Surface water and groundwater management
- Quantity and quality in water resources management
- Upstream and downstream water-related interests
- Water and wastewater management
- Integration of all stakeholders in planning & decision process
- The natural system and the HUMAN system
 - mainstreaming water in the national economy
 - ensuring coordination between sectors
 - ensuring partnership between public and private sector management
 - involving everybody!





Integration
Participation
Collaboration



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