



**LoGo Water: Towards effective involvement of local government in
Integrated Water Resources Management (IWRM) in the river basins of the
Southern African Development Community (SADC) region**

Key terms and definitions

by
Stef Smits

Contact: smits@irc.nl

IRC International Water and Sanitation Centre, Delft, the Netherlands

May 2005



LoGo Water was funded by Directorate-General Research of the European Commission,
contract number INCO-CT2004-003717 (Jan. 2005 – March 2008).

Legal notice: Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of the following information. The views expressed in this publication are the sole responsibility of the authors and do not necessarily reflect the views of the European Commission.

Key terms and Definitions

List of contents

1. Paradigms:.....	1
2. Governance:.....	1
3. Water management:	2
4. Water services:	2
4.1. Demand.....	2
4.2. Use.....	3
4.3. Services.....	3
5. Water and environment:.....	4
5.1. Ecology	4
5.2. Quantity	5
5.3. Quality	5
5.4. Land-water linkages	5
6. Geographical:	5
7. References	7

Key terms and Definitions

1. Paradigms:

- **Integrated Water Resources Management (IWRM)¹:** Integrated water resource management is a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (Global Water Partnership, 2000).
- **Dublin Principles of IWRM:** These are the basic principles for IWRM agreed upon in the Dublin conference in 1992:
 - I Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
 - II Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels.
 - III Women play a central part in the provision, management and safeguarding of water.
 - IV Water has an economic value in all its competing uses and should be recognized as an economic good.
- **Sustainable development:** Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on the Environment and Development, 1987).

2. Governance:

- **Decentralisation:** The process of devolution of roles, responsibilities, resources, capacities and capabilities, usually from national government towards lower tiers of government.
- **Water governance:** The range of political, social and economic and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of society (Rogers and Hall, 2003).
- **Distributed water governance:** The mix of formal and informal institutions that are in place for managing water resources, emphasising the link between communities and local government entities (Rogers and Hall, 2003).
- **Effective water governance:** A water governance structure which is open and transparent, inclusive and communicative, coherent and integrative and equitable and ethical (Rogers and Hall, 2003).
- **Customary water management arrangements:** Water governance which is locally inspired, probably informal, and in operation.
- **Customary law:** Usually local, unwritten, and considered 'informal' rules. It may have its origins in social, cultural, ethnic, or religious experience.

¹ Both the Global Water Partnership definition and the Dublin Principles are being challenged by others. However, they are still the most commonly used and accepted definitions.

- **Local government:** The lowest tier of government, at which one finds both elected officials (councillors) and civil-servants (staff of the administration). It is a tier that usually performs or coordinates both planning and service provision functions for water and sanitation. The exact administrative name for that sphere of government may differ from country to country, for example district, municipality, governorate or local council.
- **Institutions:** The mechanisms, rules and customs by which people and organisations interact with each other.

3. Water management:

- **Water resources management:** The process of decision-making on assessment, allocation, use, regulation, monitoring and development of surface and underground water sources (based on European Commission, 1998).
- **River basin management:** The development and management of water, land and related resources on a river basin scale.
- **Supply side strategy:** Alternatives based on generating new water sources generally through hydraulic works, groundwater development, desalination and recycling techniques; these strategies are very often associated with subsidies that hinder the management of demands.
- **Water demand management:** Refers to the implementation of policies or measures which serve to control or influence the amount of water used (European Environment Agency, 2005).
- **Demand side strategies:** Strategies based on water demand management in order to induce an efficient and sustainable use of water. Examples include price policies, regulation, laws and incentives for increasing efficiency.
- **Water tariffs (water pricing):** Applying a monetary rate or value at which water can be bought or sold (European Environmental Agency, 2005).
- **Emission controls:** Controls requiring a specific emission limitation, for instance an emission limit value, or otherwise specifying limits or conditions on the effects, nature or other characteristics of an emission or operating conditions which affect emissions. (EC, 2000).
- **Emission limit values:** The mass, expressed in terms of certain specific parameters, concentration and/or level of an emission, which may not be exceeded during any one or more periods of time (EC, 2000).
- **Community management:** The management model in which communities themselves are in control of strategic decision making about their service provision. Key principles of community management are: community participation, community control, community ownership and cost sharing by the community (Lockwood, 2004).

4. Water services:

4.1. Demand

- **Water demand (hydrological):** The quantity of water required for human, crop, livestock, environment, industrial and other needs, based upon physiological processes needed for these uses.

- **Water demand (economic):** The quantity of water which is needed for the various uses (including the environment as a user), based on the ability to pay for these uses by the users.
- **Water demand (socio-economic):** The quantity of water which is needed for the various uses (including the environment as a user), based on a realistic understanding by the users of the likely costs and benefits associated with it.

4.2. Use

- **Consumptive use of water:** Consumptive use relates to the water which cannot be used again, because it is lost to the atmosphere (for example evapotranspiration by plants, animals and humans, and evaporation from open water bodies) or polluted to such an extent that it cannot be used again further in the hydrological cycle.
- **Non-consumptive uses of water:** Water uses from which water can be used again elsewhere in the hydrological cycle (for example through reuse of return flows or recharge of groundwater).
- **Domestic uses:** Refers to the uses at household level and include drinking, cooking, washing, cleaning and water required for sanitation. They may also include small-scale productive uses such as backyard gardens, cattle watering or small home-based industries.
- **Productive uses:** Those uses of water that are related to economic activities, including irrigation, livestock farming and industries.

4.3. Services

- **Water services²:** All services that provide, for households, public institutions or any economic activity:
 - abstraction, impoundment, storage, treatment and distribution of surface water or groundwater
 - wastewater collection and treatment facilities which subsequently discharge into surface water (EC, 2000)
- **Domestic (or drinking) water supply:** The services (institutions, resources and infrastructure) that provide for households and public institutions the functions of abstraction, impoundment, storage, treatment and distribution of surface water or groundwater for the purpose of domestic uses.
- **Bulk water supply:** This is the first phase of water supply and consists of the provision of raw water including river regulation (dams), abstraction and transportation (channels and pipelines) into the distribution network.
- **Retail water supply:** This is the second phase of domestic water supply, including water purification and distribution for domestic and industrial uses.
- **Raw water:** Water in its natural state, prior to any treatment for drinking (US Environmental Protection Agency, 2005).
- **Sanitation services:** The application of measures and techniques aimed at ensuring and improving general hygiene in the community, including the collection, evacuation and

² Although we prefer this broad definition of water services, many people understand water services as referring only to domestic water supply services, and not including water for economic activities.

disposal of liquid and solid wastes, as well as measures for creating favourable environmental conditions for health and disease prevention. (European Environmental Agency, 2005).

- **Wastewater:** Wastewater refers to water discharged from human settlements and industrial areas. It usually contains both chemical pollutants and pathogens. Wastewater can be broken down into “grey” water and “black” water. Grey water contains the waste when water is used in the kitchen, showering, etc. and does not contain faecal matter. Black water refers to water containing faecal matter.
- **Irrigation:** The services (institutions, resources and infrastructure) that provide for the artificial application of water to grow crops.
- **Drainage:** The services (institutions, resources and infrastructure) which provide a managed way of controlling water flows within a landscape. This may relate to drainage of an area so it can become dry and be used for urban development, or it can also relate to the drainage system associated with the return flow of water from a water supply or irrigation system.
- **Return flow:** That part of a diverted flow that is not consumptively used and returned to its original source or another body of water (for example drainage water from farm lands or wastewater).

5. Water and environment:

5.1. Ecology

- **Instream use:** Water uses that can be carried out without removing the water from its source, as in ecosystems, fisheries, navigation and recreation (US Environmental Protection Agency, 2005).
- **Environmental flow / ecological regime / environmental requirements / environmental regime / ecological reserve / instream flow requirement³:** A regime of adequate flows for achieving the Good Ecological Status as defined in the EU Water framework Directive (EC, 2000).

The objective of environmental flows is maintaining or partially restoring important characteristics of the natural flow regime (i.e. the quantity, frequency, timing and duration of flow events, rates of change and predictability/variability) required to maintain or restore the biophysical components and ecological processes of in-stream and groundwater systems, floodplains and downstream receiving waters (Athington and Pusey, 2003).

The quantity and quality to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource (RSA, 1998).

- **Ecosystem services:** Ecosystem services are those ecological, hydrological and geographical processes which occur within ecosystems and which underpin the reliable functioning of those systems.
- **River health:** The ability of the aquatic ecosystem to support and maintain key ecological processes and a community of organisms with a species composition,

³ These are all different names for the same concept. Different authors give different definitions, but all embrace the same notion.

diversity and functional organisation as comparable as possible to that of natural habitats within a region.

5.2. Quantity

- **Safe yield:** The annual quantity of water that can be taken from a source of supply (surface or groundwater) without depleting the source beyond its ability to be replenished naturally in "wet years" (US Environmental Protection Agency, 2005).
- **Over-abstraction:** The amount of water withdrawn from a source (surface or groundwater) in excess of the average inflow or recharge of the basin or aquifer.

5.3. Quality

- **Pollution:** The direct or indirect introduction, as a result of human activity, of substances or heat into the air, water or land which may be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems, which result in damage to material property, or which impair or interfere with amenities and other legitimate uses of the environment. (EC, 2000)
- **Hazardous substances:** Substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern. (EC, 2000)
- **Diffuse pollution:** Pollution from widespread activities with no one discreet source, for example acid rain, pesticides, urban run-off, etc. (European Environment Agency, 2005).
- **Point source pollution:** Pollution coming into a water body at a discrete point, for example a sewer outlet.
- **Biochemical oxygen demand (BOD):** The amount of oxygen, measured in milligrams per litre, which is removed from aquatic environments by the life processes of microorganisms.

5.4. Land-water linkages

- **Desertification:** Land degradation as a reduction or loss in arid, semi-arid or dry sub humid areas of the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest, and woodlands...caused by... (i) soil erosion caused by wind and/or water; (ii) deterioration of physical, chemical, biological or economic properties of soil; and (iii) long-term loss of natural vegetation (European Environmental Agency, 2005).

6. Geographical:

- **Water resources:** The different sources of water: rainwater, surface water and groundwater.
- **Blue water:** Water in open bodies (lakes, rivers, etc.) and aquifers.
- **Green water:** Water in the soil, available for plant growth.
- **White water:** Water fixed in ice caps, glaciers, permanent snow, etc.
- **Black water:** Water carrying faecal matter.

- **Grey water:** Water containing waste coming from the kitchen, laundry places, etc, and is not contaminated by faecal matter.
- **Aquifer:** A subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater (EC, 2000).
- **Groundwater:** All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil (EC, 2000).
- **Surface water:** Inland waters, except groundwater; transitional waters and coastal waters (EC, 2000).
- **Transitional waters:** Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are substantially influenced by freshwater flows (EC, 2000).
- **River:** A body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course (EC, 2000).
- **River basin:** The area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta (EC, 2000).
- **Transboundary or trans-jurisdictional river basin:** a river basin which crosses two or more countries or other areas of (administrative) jurisdiction (such as States or provinces).
- **Sub-basin/watershed/catchment⁴:** The area of land from which all surface run-off flows through a series of streams, rivers and, possibly, lakes to a particular point in a water course (normally a lake or a river confluence) (EC, 2000).
- **Riparian zone:** Relating to or located on the bank of a body of water, especially streams and rivers.
- **Sediment:** Particles, suspended or settled in water, derived from rocks or biological materials, which have been transported by a fluid or other natural process.
- **Siltation:** Deposition of fine soil and rock particles on the bottom of stream and river beds and reservoirs.

⁴ These terms are all used to describe the same thing. In British English the word catchment is more common, while American English uses the word watershed more often.

7. References

Arthington, A. and Pusey, B. (2003) *Flow restoration and protection in Australian rivers*. *River Research and Applications* 19: 377-395.

EC (1998) *Towards Sustainable Water Resources Management; A strategic approach*. Luxembourg

EC (2000) Water Framework Directive.

European Environmental Agency (2005) Multi-lingual environmental glossary. Available at: <http://glossary.eea.eu.int/EEAGlossary/>

FNC (2005) *European Declaration for a New Water Culture*. Fundación Nueva Cultura del Agua, Madrid, Spain. Available at

<http://www.unizar.es/fnca/euwater/index2.php?x=3&idioma=en>

GWP (2000), *Integrated Water Resources Management*. Global Water Partnership. Technical Advisory Committee Paper 4. Stockholm, Sweden

Lockwood, H. (2004) *Scaling up community management of rural water supply*. Thematic Overview Paper. IRC International Water and Sanitation Centre, Delft, the Netherlands.

Moriarty, P., Butterworth, J. and C. Batchelor (2004) *Integrated Water Resources*

Management and the domestic water and sanitation sub-sector. Thematic Overview Paper. IRC International Water and Sanitation Centre, Delft, the Netherlands.

Republic of South Africa (1998) *National Water Act*. Pretoria, South Africa

Rogers, P., and Hall, A.W., (2003), *Effective Water Governance*, TEC Background Papers No. 7, Global Water Partnership, Technical Committee, Stockholm, Sweden. Available at: <http://www.gwpforum.org/gwp/library/TEC%207.pdf>

U.S. Environmental Protection Agency (2005): *Drinking Water Glossary*. Available at: www.epa.gov/safewater/glossary.htm

World Commission on the Environment and Development (1987) *Our common future*.

LoGo Water: Towards effective involvement of local government in Integrated Water Resources Management (IWRM) in the river basins of the Southern African Development Community (SADC) region

This glossary is an output of LoGo Water, a research project aimed at improving the capacity of Local Governments to implement IWRM, thus contributing to the achievement of water-related Millennium Development Goals (MDGs).

In the context of the same project, a set of materials entitled ‘Local Governments and Integrated Water Resources Management (IWRM)’ has been produced.

The IWRM set of materials consists of the following four parts:

Part I: Reaping the Benefits – How Local Governments Gain from IWRM

Part II: Understanding the Context – The Role of Local Government in IWRM

Part III: Engaging in IWRM – Practical Steps and Tools for Local Governments

Part IV: Making Water Work for Local Governments – Ten Top Tips for Integration in Water Management

The complete set is available to download from <http://www.iclei-europe.org/logowater>