water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP

INTEGRATED WATER QUALITY MANAGEMENT SYMPOSIUM
THEME: TAKING INNOVATION INTO PRACTICE
31 May 2017, Centurion

WATER QUALITY MANAGEMENT CHALLENGES AND INNOVATION IN MANAGEMENT

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INTRODUCTION

Water of a good quality is fundamental to:

- Food and energy security,
- Economic growth (construction, manufacture, tourism etc.),
- Protection of the environment,
- Maintaining human health and wellness, and
- Sustaining livelihoods.

- Globally, the availability of good-quality water is considered a condition for alleviating poverty (*Creamer Media (Pty) Ltd, 2011*)

BACKGROUND

Water Quality and a Prosperous, Sustainable Nation

- **Water pollution has a direct impact on economic growth, human health, ecosystems, job creation and the cost of doing business**
- **Some examples:**

Cost associated with reduction in crop yields

Costs associated with treating affected water

Costs to the public and private health system from diseases related to polluted water

Costs related to clearing of waterways and drainage systems

Costs related to tourism losses

Costs related to loss of ecosystem functions

WATER QUALITY MANAGEMENT CHALLENGES

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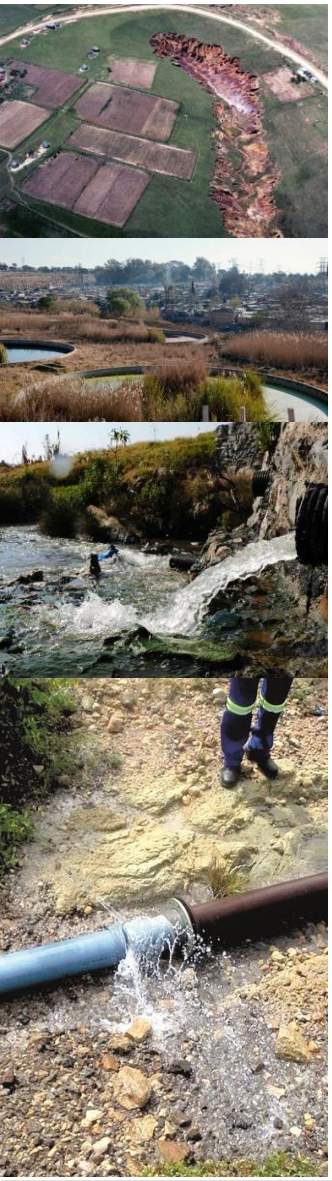


- Vandalism of Infrastructure
- **Dysfunctional WWTW's**
- Lack of sufficient maintenance plans
- Poor budgeting
- **Lack of** sufficiently adequate / **appropriate urban planning**
- Lack of **sufficient formal sanitation** in all informal settlements.
- **Destruction of ecological infrastructure** (wetlands)
- Flow regime changes (less dilution capacity)
- Use of Inappropriate land management practices
- Lack of adequate litter control and prevention measures
- Lack of sufficient institutional, technical and financial capacity
- Intricate procurement processes (government is slow to react)
- Ineffective monitoring

WATER QUALITY MANAGEMENT CHALLENGES

- Uncontrolled discharges from abandoned mines and runoff from discarded mine dumps (legacy issues).
- Inadequate **financial provisioning** for rehabilitation
- Insufficient precautionary planning, regulation and enforcement
- **Insufficient compliance with licence conditions;** inappropriate licence conditions; inadequate enforcement capacity
- Land degradation and over-grazing
- Inappropriate fertilization practices/over-fertilization
- Over-irrigation and in-appropriate irrigation technology
- Lack of **sufficient awareness creation programmes** on water pollution
- Lack of sufficient incentives to treat water or support from government to use alternative technology

WATER QUALITY STATUS IN SA

- **Most predominant constituents of concern in SA:**
  - Nutrients
  - Salts
  - Microbial contamination
  - Urban Runoff & Litter

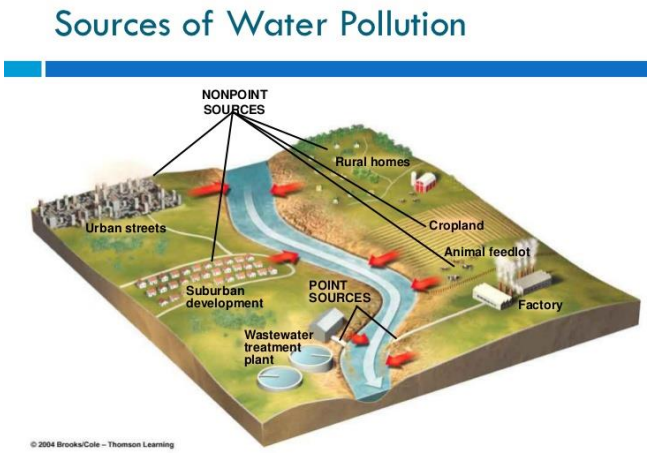
- **Other issues that have been identified are:**
  - Acidification,
  - Siltation/sedimentation,
  - Metals in sediment,
  - Persistent Organic Pollutants (including agro-chemicals),
  - Radiation,
  - Thermal Pollution,
  - Nano-particle pollution, CEC and EDC.

- **For many of these the exact extent at a national scale is unknown.**

DISTRIBUTION OF ISSUES VARIES DEPENDING ON THE LAND-USE ACTIVITIES

Sector	Main Associated Contaminant
Mining	Salts pH changes (acidification) Metals Toxins Radiation
Urban Activities	Toxins Nutrients Salts Microbial contaminants
Agriculture	Salts Nutrients Microbial contaminants Toxins/POPs (pesticides, herbicides)
Industry	Salts Thermal contamination Toxins & POPs

SOME FACTORS THAT MAY CONTRIBUTE TO THE WQM CHALLENGES



- **Lack of necessary alignment and coordination within and between government departments:** WQM hampered by poor coordination & conflicting approaches
- **Lack of necessary finance for WQM:** Financial resources available are insufficient and do not recognize the investment required to counteract economic harm.
- **Lack of sufficient data and information management:** Data sharing is a challenge, including transboundary-management. There is a challenge in ensuring that the public has access to information
- **Lack of sufficient capacity & skills**
- **Lack of a Sector approach and ownership at all levels:** Self regulation, awareness and accountability

It is evident that inadequate management of water quality challenges impacts on the environment, peoples' wellbeing, the growth of the economy and the cost of doing business.

In response to the country's need to take an **improved INTEGRATED approach to Water Quality Management (WQM)**, the Department of Water and Sanitation initiated a project to **revise its current WQM Policies** and **develop a National, Integrated Water Quality Management (WQM) Strategy**.

INTEGRATED WATER QUALITY MANAGEMENT STRATEGY

"INNOVATION"

INNOVATION

There is a need to:

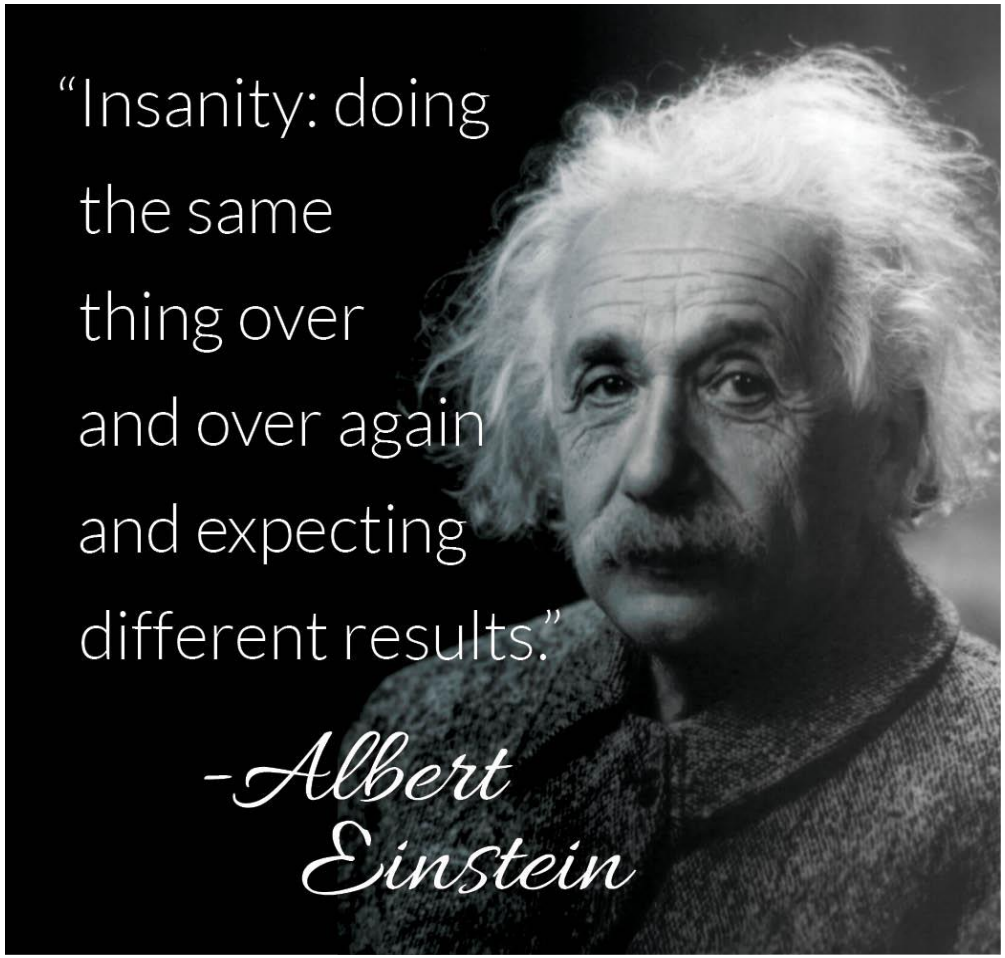
Institutionalise Water Quality ***(PV, 2016)***

"Integrated Water Quality Management is not new but we need to make it COMMON practise"

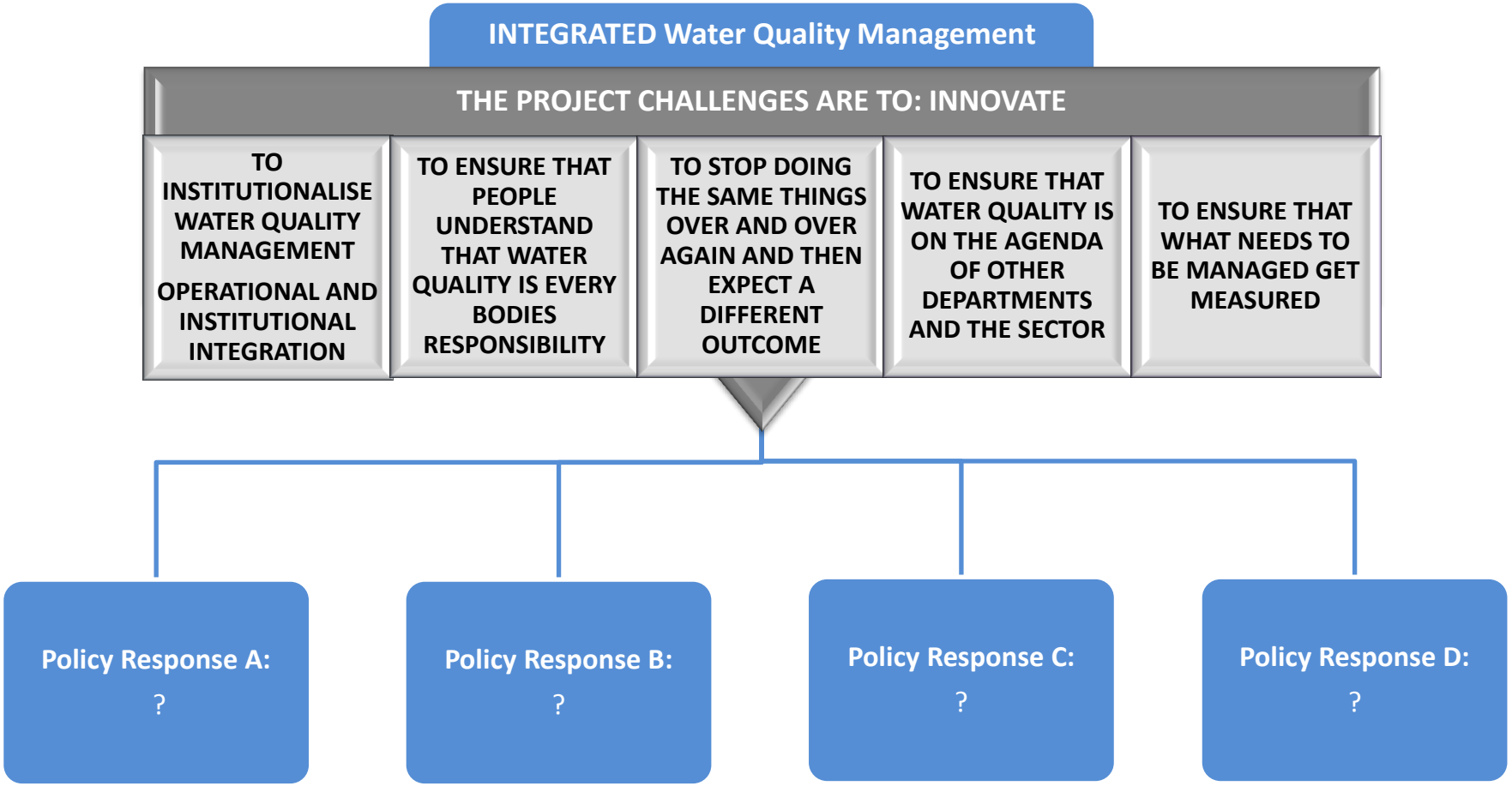
Institutionalise

verb

1.establish (something, typically a practice or activity) as a convention or norm in an organization or culture.

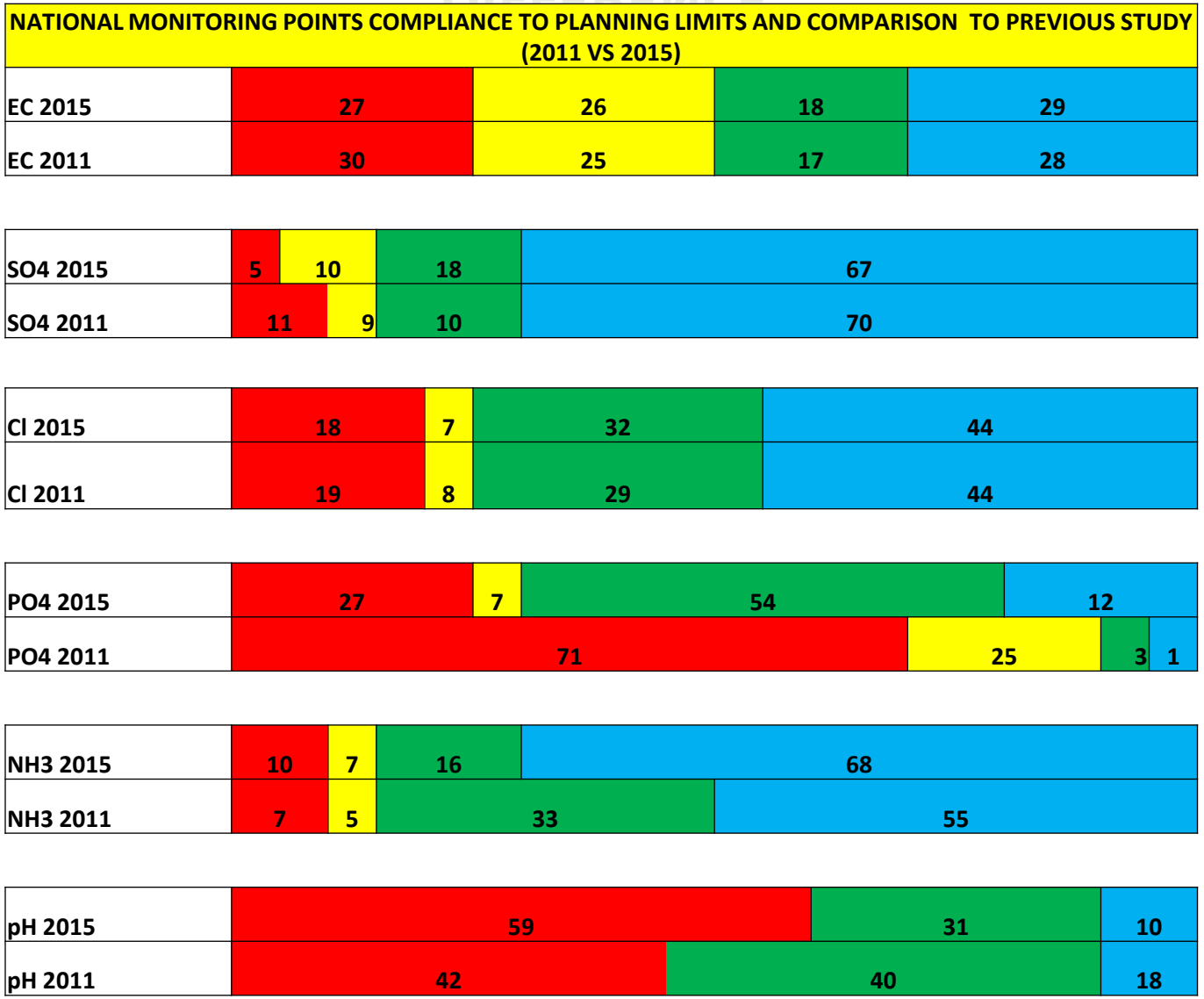


PROJECT: POLICY/STRATEGY BRIEF



DWS Vision: "a dynamic, people centred department, leading the effective management of the nation's water resources, to meet the needs of current and future generations"

HOW DOING THINGS DIFFERENTLY CAN MAKE A DIFFERENCE



INNOVATIVE: PROTECTION-BASED CLASSIFICATION OF WATER RESOURCES

SECTION-12: Prescription of the classification system

The system for classifying water resources may:

12(2)(b)(iii) set out water uses for instream or land based activities which **activities must be regulated or prohibited** in order **to protect the water resource**; and

12(2)(c) **provide for such other matters** relating to the protection, use, development, conservation, management and control of water resources, **as the Minister considers necessary**.

IWQM POLICY RESPONSE

Vision
/vi-zhun/

The image or insight of how something could or should be in the future

Government, in partnership with private sector and civil society, secures water that is fit for use, for all, forever!

PILLAR A: Taking an inclusive approach to IWQM

PILLAR B: Applying integrated, adaptive IWQM

PILLAR C: Financing IWQM

PILLAR D: Building the knowledge and capacity base for IWQM

IWQM Policy Values, Goal and Principles

Relevant Legislation, Policies and Strategies related to WQM

Constitution of South Africa

CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996

CHAPTER 2: BILL OF RIGHTS

24. Environment. - Everyone has the right:

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of the present and future generations, through reasonable legislative and other measures that–

(i) prevent pollution and degradation;

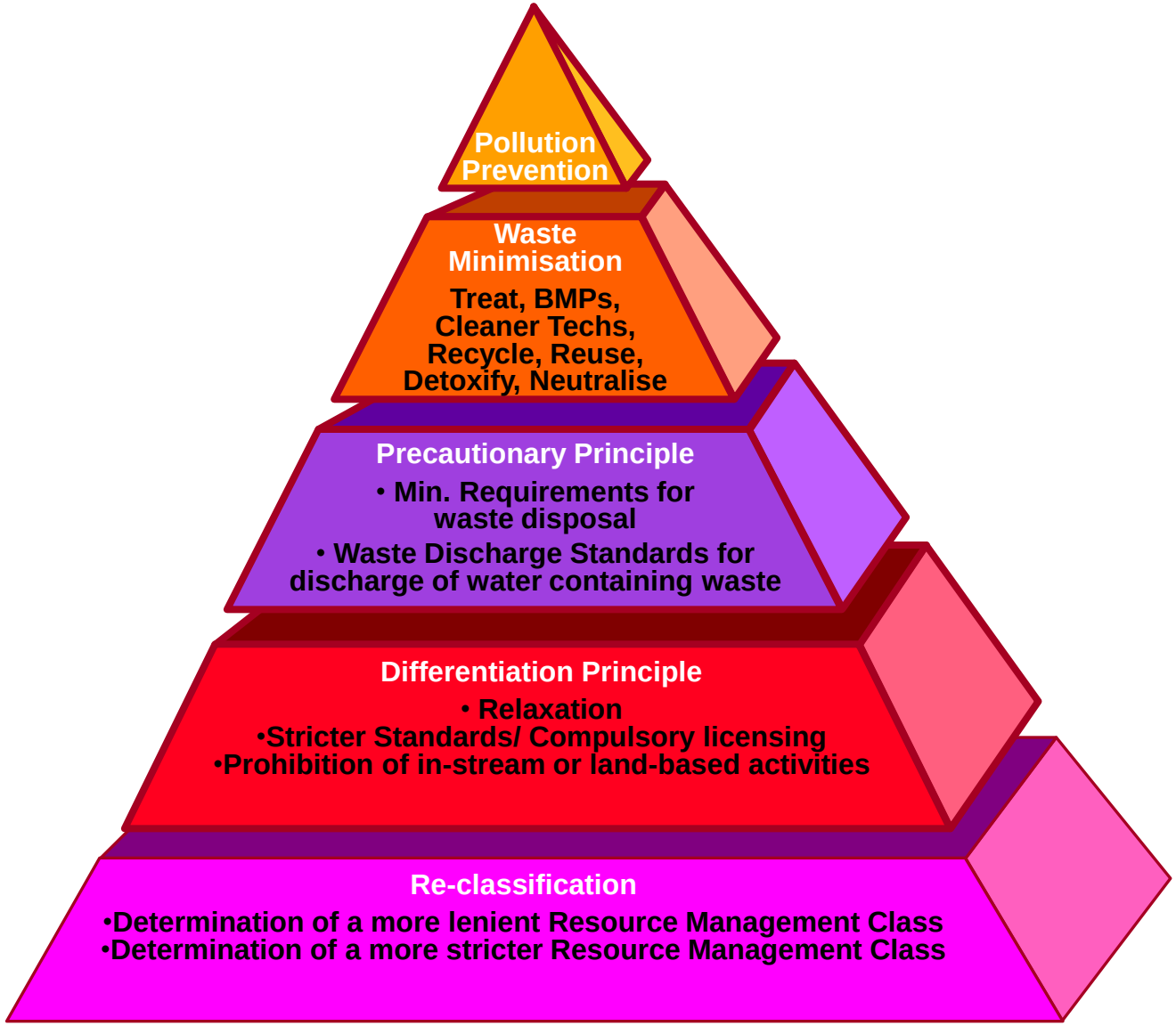
(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

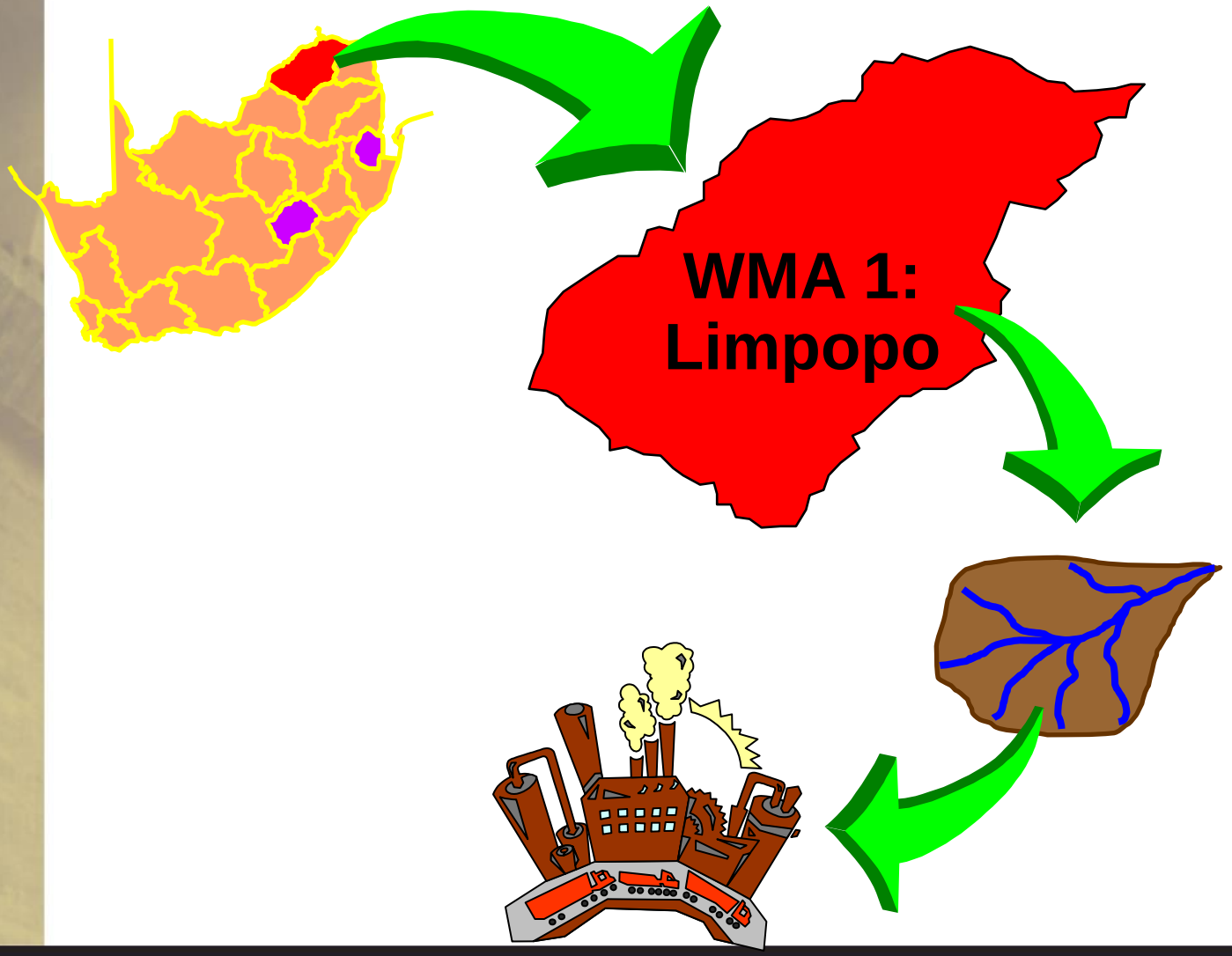
CONTEXT AND MOTIVATION FOR THE PROTECTION OF WATER RESOURCES

- The vision for water quality management in South Africa is captured in the concise statement **"Fit for use, for all, forever"**,
  - **Fit for use** - A scientific judgement, involving objective evaluation of available evidence, of **how suitable the quality of water is for its intended use** or for protecting the health of aquatic ecosystems.
  - **For all** - This indicates a fundamental commitment to equitable utilisation. It is accepted that water resources will be utilised in ways which will **benefit all the people of South Africa**.
  - **Forever** - This acknowledges the **commitment to sustainable management**: the willingness to balance the needs for long term access to the water resource, against the needs for short term development and utilisation.

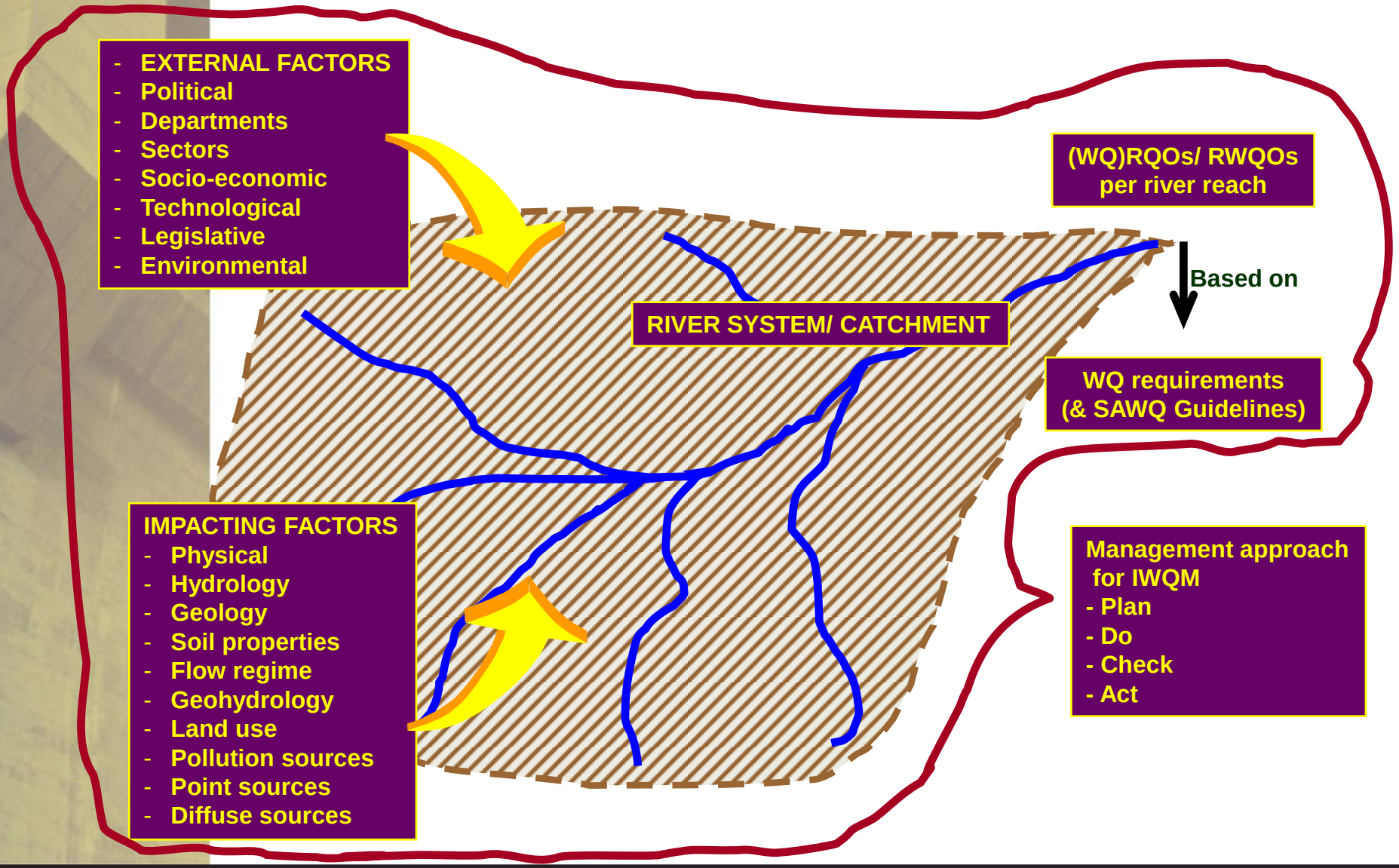
DECISION-TAKING HIERARCHY



WQM NEED TO INTEGRATE AT VARIOUS LEVELS FROM A NATIONAL TO WMA, CATCHMENT AND SSI

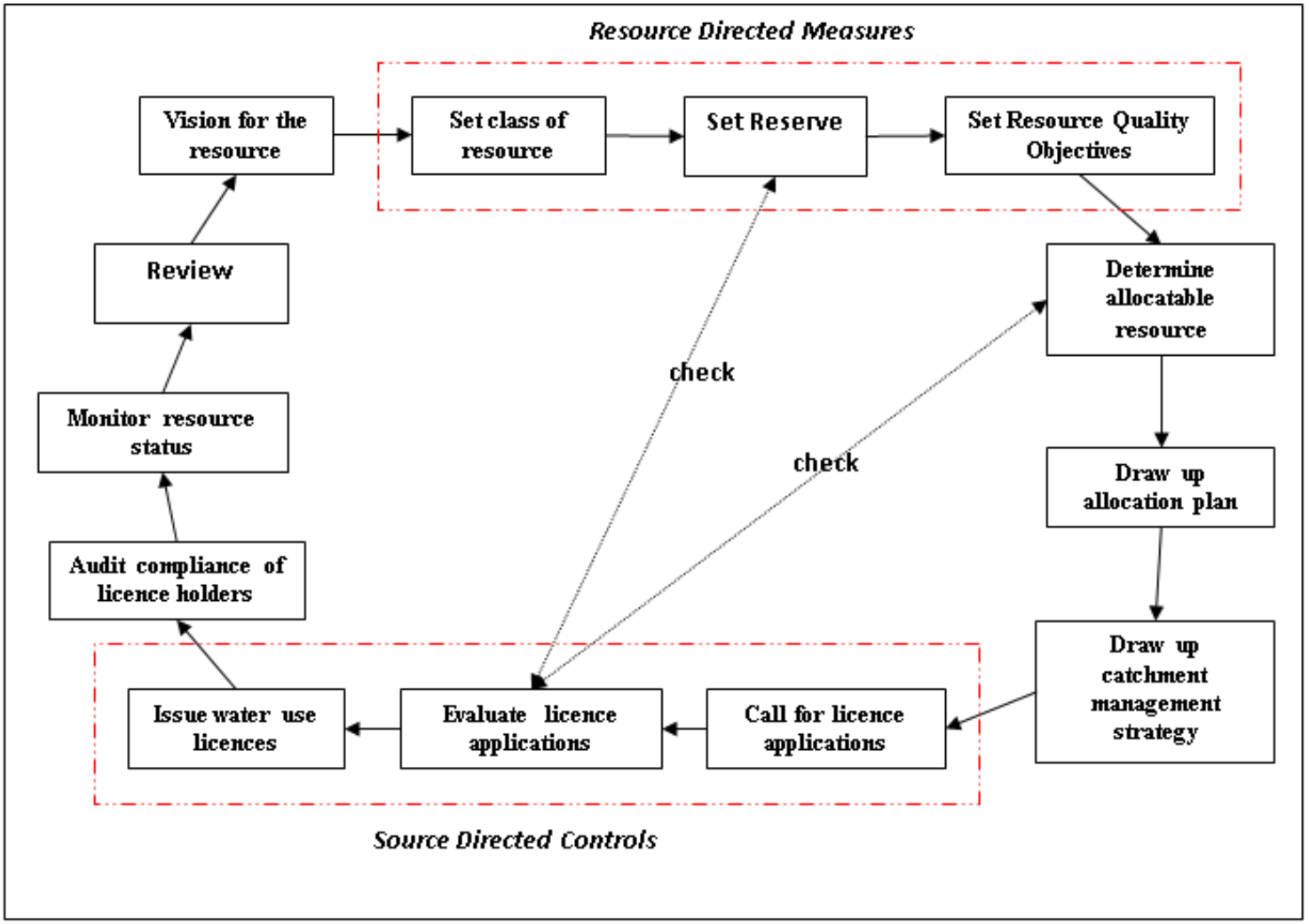


THE CATCHMENT CONTEXT OF IWQM

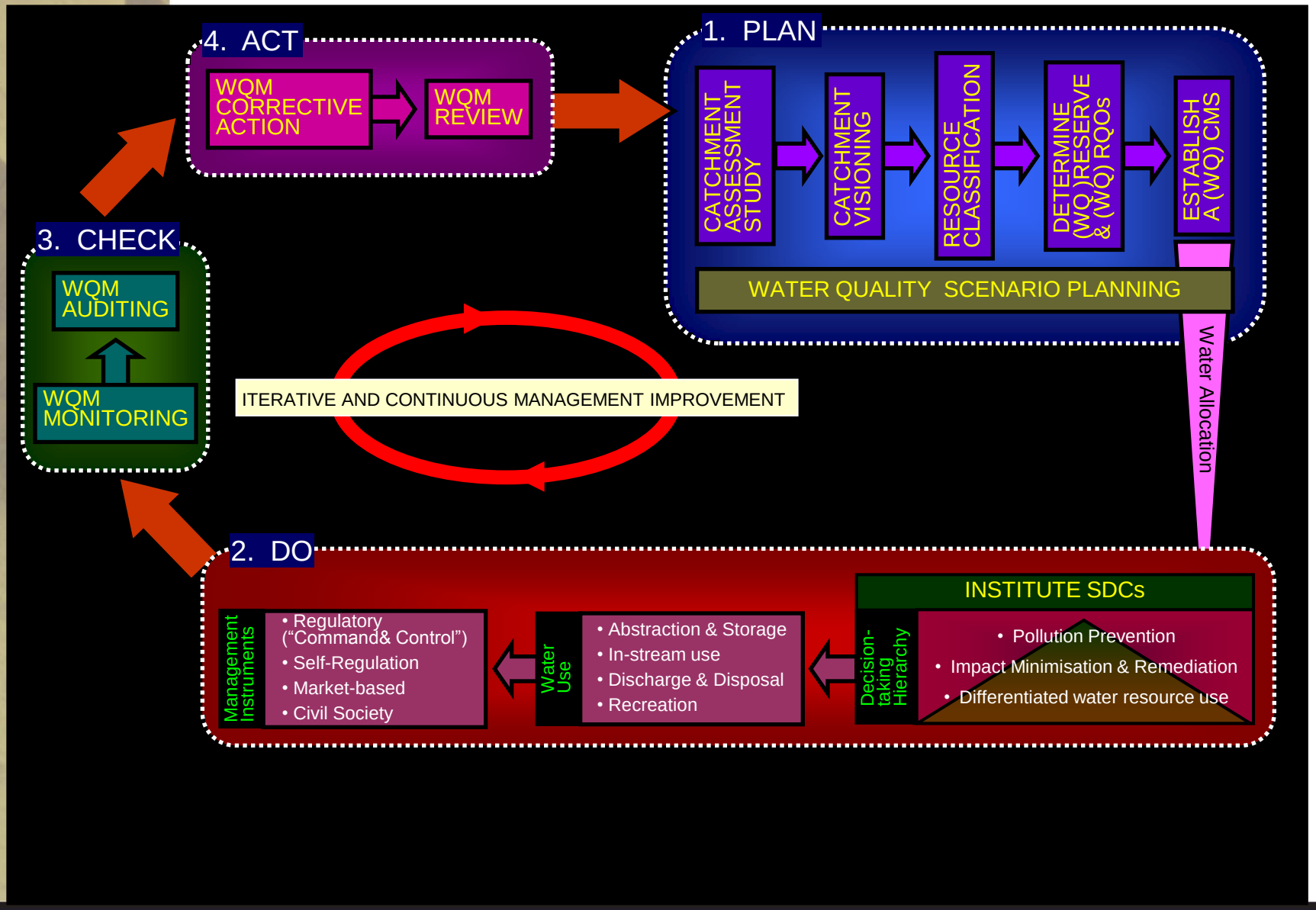


FRAMEWORK FOR INTEGRATION

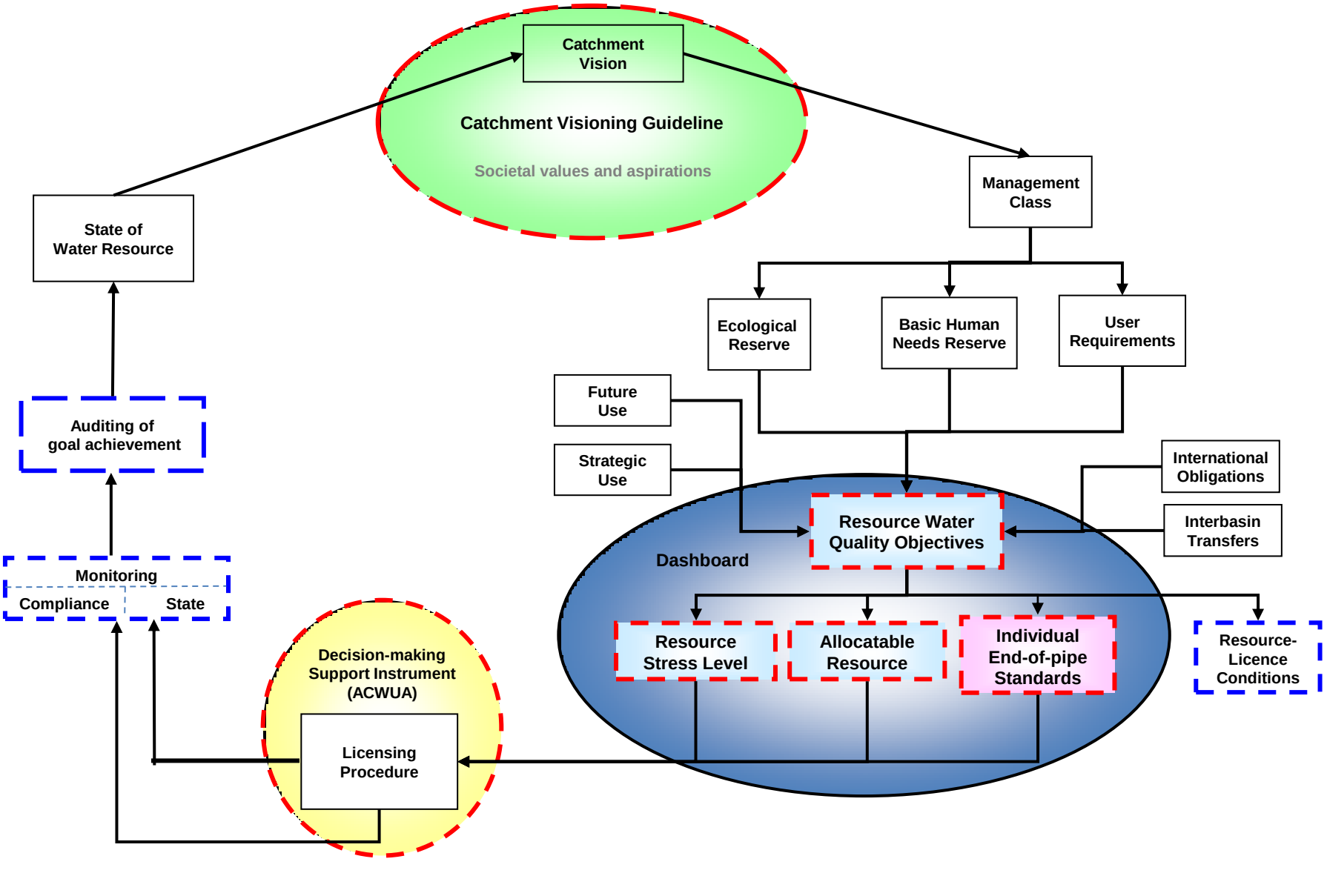
RESOURCE DIRECTED MEASURES FOR PROTECTION OF WATER RESOURCES: INTEGRATED MANUAL (1999)



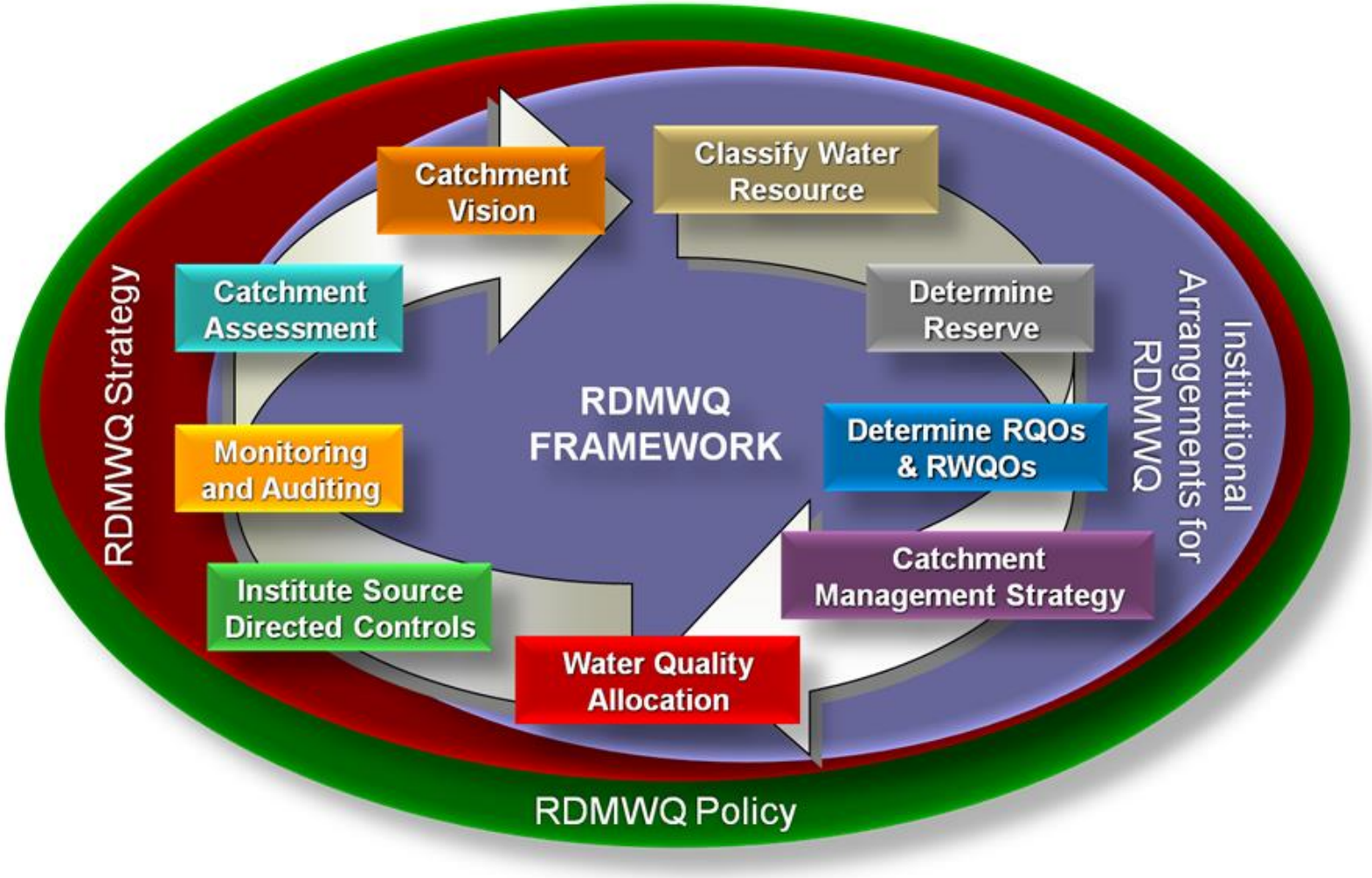
IWQM PROCESS DIAGRAM (2003)



RDMWQ FRAMEWORK FOR MAKING RDM OPERATIONAL: 2004



RESOURCE DIRECTED MANAGEMENT OF WQ PROCESS: 2006



1. PLAN — Integrated Water Quality Planning

CATCHMENT ASSESSMENT STUDY

ANALYSE THE RESERVE

- ECOLOGICAL COMPONENT: A | B | C | D | E | F
- BASIC HUMAN NEEDS COMPONENT: I | A | T | U

ANALYSE OTHER USER REQUIREMENTS

- "BULK" DOMESTIC: I | A | T | U
- AGRICULTURE: I | A | T | U
- INDUSTRY: I | A | T | U
- RECREATION: I | A | T | U

EVALUATE
- Institutional status
- Any other applicable PPPs

ASSESS
- Social attributes
- Economic attributes
- Bio-physical attributes

PP WQM

CATCHMENT FORUMS

CATCHMENT VISIONING

AFFORD LEVEL OF PROTECTION

CLASSIFICATION SYSTEM

DETERMINE RESOURCE MANAGEMENT CLASS

- CLASS I — Minimally used Water Resource
- CLASS II — Moderately used Water Resource
- CLASS III — Heavily used Water Resource

DETERMINE RESERVE & RQOS

STRATEGIC WQM

ESTABLISH A (WQ)CMS

- Determine incremental RWQOs
- Determine incremental SMOs
- Develop Sectoral WQM Plans
- Develop Single Source WQM Plans

WQ SCENARIO PLANNING

- Decision support for Catchment RQM;
- WQM foresight;
- Reconciliation of water resource potential and demand;
- Influencing land-use planning and development; etc.

ITERATIVE AND CONTINUOUS MANAGEMENT IMPROVEMENT

2. DO

INSTITUTE SDCs

Decision-taking Hierarchy:
- Pollution Prevention
- Impact Minimisation & Remediation
- Water resource use

Self-regulatory Management Instruments	Regulatory Management Instruments	Market-based Management Instruments
• ISO 14001 Certification	• Water Use Licensing • EMPR Process • Landfill Permits	• WDCS

3. CHECK

WQM MONITORING → WQM AUDITING

4. ACT

WQM CORRECTIVE ACTION → WQM REVIEW

KEY:
A,B,C,D,E,F = ECOLOGICAL CATEGORIES, PPPs = POLICIES, PROGRAMMES & PLANS,
I = IDEAL, A = ACCEPTABLE, T = TOLERABLE, U = UNACCEPTABLE,
WQ = WATER QUALITY, PP = PARTICIPATIVE, WQM = WATER QUALITY MANAGEMENT,
RQOs = RESOURCE QUALITY OBJECTIVES, RWQOs = RESOURCE WATER QUALITY OBJECTIVES,
SMOs = SOURCE MANAGEMENT OBJECTIVES,
(WQ)CMS = WQM COMPONENT OF THE CATCHMENT MANAGEMENT STRATEGY,
SDCs = SOURCE DIRECTED CONTROLS, WDCS = WASTE DISCHARGE CHARGE SYSTEM

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IWQMS PROJECT PHASES

Project Commenced : 4th October 2015

Completed Oct 2015 -Jan 2016	Inception	• Clarify the expectations and scope for the project
Completed Jan 2016 – Mar 2016	Assessment	• Comprehensive literature survey • Identification of the WQ and WQM Challenges in SA
Completed Aug 2016 – Feb 2017	Policy	• Define Policy Principles • Revise, update & integrate existing WQM policies
Completed Aug 2016 – Feb 2017	Strategy	• Revise, update & integrate existing WQM strategies based on inputs from Stakeholders & assessment phase
March 2017 –	Policy into Practice	• Develop a pragmatic plan to implement, monitor and evaluate the execution of the policy and strategy.

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Thank you