



The Inkomati Catchment Management Strategy

APPENDICES



INKOMATI
CATCHMENT MANAGEMENT AGENCY

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APPENDIX A

STAKEHOLDER ATTENDEES

APPENDIX A: STAKEHOLDER DATABASE

This is a list of Attendees at the CMS workshops.

The full ICMA Stakeholder Database is available on request.

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APPENDIX B

LEGISLATION

APPENDIX B: LEGISLATION

LEGISLATION APPLICABLE ON THE ICMA

Inter alia the following legislation is applicable on the ICMA:

- Constitution of the Republic of South Africa, 1996
- National Water Act 36 of 1998 and Regulations
- Public Finance Management Act 1 of 1999 and National Treasury Regulations
- Water Act 54 of 1956 in respect of Irrigation Boards
- Labour Relations Act 66 of 1995
- Basic Conditions of Employment Act 75 of 1997
- Skills Development Act 97 of 1998
- Skills Development Levies Act 9 of 1999
- Employment Equity Act 55 of 1998
- Occupational Health and Safety Act 85 of 1993
- Compensation for Occupational Injuries and Disease Act 130 of 1993
- Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000
- Medical Aid Scheme Act 131 of 1994
- Prevention and Combating of Corrupt Activities Act 12 of 2004
- Protected Disclosures Act 26 of 2000
- Road Traffic Act and Regulations
- National Archives Act 43 of 1996
- Legal Deposit Act 54 of 1997
- Public Audit Act 25 of 2004
- Income Tax Act 58 of 1962
- Promotion of Administrative Justice Act
- PAIA

POWERS AND FUNCTIONS OF THE ICMA

The ICMA is an organ of state as defined in section 139 of the Constitution of the Republic of South Africa. Section 41(1) (f) of the Constitution reads as follows:

- 41 (1). All spheres of government and all organs of state within each sphere must:
- (f) not assume any power or function except those conferred on them in terms of the Constitution;

The meaning of section 41(1) (f) of the Constitution is that an organ of state may exercise powers and perform functions only if such powers or functions are conferred on it by the Constitution or legislation in terms of the Constitution. In the case of the ICMA the empowering legislation in terms of the Constitution regarding powers and functions are mainly the National Water Act and Public Finance Management Act.

OVERVIEW OF THE RELEVANT PROVISIONS OF THE NWA

Section 1(xx)

“responsible authority”, in relation to a specific power or duty in respect of water uses, means –

- (a) if that power or duty has been assigned by the Minister to a catchment management agency, that catchment management agency; or
- (b) if that power or duty has not been so assigned, the Minister;

Section 1(xxv)

“water management area” is an area established as a management unit in the national water resource strategy within which a catchment management agency will conduct the protection, use, development, conservation, management and control of water resources;

Section 19

The ICMA as catchment management agency has the powers and functions in respect of the prevention and remedying of water resource pollution as stipulated in section 19.

Section 20

The ICMA as catchment management agency has the powers and functions in respect of the control of emergency incidents in respect of water resource pollution or potential water resource pollution as stipulated in section 20.

Chapter 4

Chapter 4 lays the basis for regulating water use. The various types of licensed and unlicensed entitlements to water use are dealt with in detail. Water use is controlled by the relevant responsible authority which can be either the Minister or the relevant assigned catchment management agency. At present the water use powers and duties are not assigned to the ICMA.

Section 57

In terms of section 57 water use charges may be made within a specific water management area or on a national or regional basis. Charges made within a specific water management area may be made by and are payable to the relevant water management institution. In the case of the Inkomati Catchment Management area the ICMA is the relevant water management institution. If the water charges would be made within specifically the ICMA water management area such charges would then be payable to the ICMA as relevant water management institution.

Section 58

The Minister may direct any water management institution to recover any water use charges made by the Minister on a national or regional basis from water users within its water management area or area of operation as the case may be. The ICMA as water management institution can be directed by the Minister as such.

Section 63

The Minister may delegate a power and duty vested in the Minister inter alia to a water management institution that includes the ICMA.

Section 72

In areas where a catchment management agency is not operational all the powers and duties of a catchment management agency including those described in sections 79 and 80 and in Schedule 3 vest in the Minister. Those powers and duties in Schedule 3 not assigned by the Minister to the catchment management agency still vest in the Minister.

Section 73

The Minister may after consultation with the relevant catchment management agency by notice in the Gazette assign to that catchment management agency a power or duty of a responsible authority and any power or duty in Schedule 3. The Minister must also promote the management of water resources at catchment management level by assigning powers and duties to catchment management

agencies when it is desirable to do so. In terms of a governing board resolution of 7 July 2008 a request was submitted during August 2008 that the Minister assign all the powers and duties in Schedule 3 to the ICMA. The indication is that this request is under consideration.

Section 75

The director-general may delegate any power including a power granted or delegated director-general under the National Water Act to inter alia a water management institution which includes catchment management agencies. The ICMA did not receive any such delegated powers.

Section 79

As catchment management agency the ICMA is a body corporate and has the powers of a natural person of full capacity, except those powers which by nature can only be attached to natural persons and which are inconsistent with the Act.

Schedule 4 of the Act applies to the ICMA and its governing board, committees and members.

A catchment management agency may perform any of its functions and functions reasonably incidental to its functions outside its water management area if this does not limit its capacity to perform its functions in its water management area or detrimentally affect another water management institution.

A catchment management agency must in performing its functions be mindful of the constitutional imperative to redress the results of past racial and gender discrimination and to achieve equitable access for all to the water resources under its control, strive towards achieving co-operation and consensus in managing the water resources under its control and to act prudently in financial matters.

Section 80

The ICMA as catchment management agency has the following initial functions in respect of the protection, use, development, conservation, management and control of water resources:

- Investigate and advise interested persons;
- Development of catchment management strategy;
- Co-ordinate the related activities of water users and water management institutions;
- Promote the co-ordination of the implementation of water services development plans; and
- Promote community participation

Section 84

A catchment management agency may raise any funds required by it for the purpose of exercising any of its powers and carrying out any of its duties in terms of this Act.

A catchment management agency must be funded by money appropriated by Parliament, water use charges and money obtained from any other lawful source.

Section 86

The catchment management agency may delegate any of its powers to a member of the governing board, an employee or a committee of the catchment management agency consisting which consists only of members of the governing board or employees of the catchment management agency.

With the written consent of the Minister the catchment management agency may also delegate powers to any other person or body.

The catchment management agency may not delegate the power to delegate or any power to make water use charges.

The power to authorise the use of water may be delegated only to a committee consisting of three or more members of the Governing Board.

Schedule 3

This schedule reflects all the powers and duties that may be exercised and performed by a catchment management agency when assigned to it by the Minister:

1. General

Referenced by [Sections 72, 73 and 151(1)(l)]

Subject to Chapter 2 and sections 72 and 73 of this Act a catchment management agency may exercise any of the powers or perform any of the duties set out in this Schedule and any other powers or duties necessary or desirable in order to ensure compliance with the Act, to the extent that such powers and duties have been assigned or delegated to it, and within the constraints of the assignment or delegation.

2. Power to manage, monitor, conserve and protect water resources and to implement catchment management strategies

A catchment management agency may--

- a) manage and monitor permitted water use within its water management area;
- b) conserve and protect the water resources and resource quality within its water management area;
- c) subject to the provisions of the Act, develop and operate a waterwork in furtherance of its catchment management strategy;
- d) do anything necessary to implement catchment management strategies within its water management area; and
- e) by notice to a person taking water, and after having given that person a reasonable opportunity to be heard, limit the taking of water in terms of Schedule 1.

3. Catchment management agencies may make rules to regulate water use

- 1) A catchment management agency may make rules to regulate water use.
- 2) The rules made under subitem (1) may relate, amongst other things, to--
 - a) the times when;
 - b) the places where;
 - c) the manner in which; and
 - d) the waterwork through which, water may be used.
- 3) A water user must adhere to any such rules which apply to that user.

- 4) A rule made under subitem (1) prevails over a conflicting distribution condition contained in any authorisation.
- 5) Before making rules a catchment management agency must--
 - a) publish a notice in the Gazette--
 - i) setting out the proposed rules;
 - ii) inviting written comments to be submitted on the proposed rules, specifying an address to which and a date before which the comments are to be submitted, which date may not be earlier than 60 days after publication of the notice;
 - b) consider what further steps, if any, are appropriate to bring the contents of the notice to the attention of interested persons, and take those steps which the catchment management agency considers to be appropriate;
 - c) consider all comments received on or before the date specified in paragraph (a)(ii); and
 - d) consider all applicable conditions for provision of services and bylaws made under the Water Services Act, 1997 (Act No. 108 of 1997), by water services institutions having jurisdiction in the area in question.
- 6) After complying with subitem (5), a catchment management agency must--
 - a) finalise the rules; and
 - b) make it known, in an appropriate manner, that the rules have been finalised and where they may be read; or
 - c) deliver or send a copy of the rules to each water user to whom the rules apply.

4. Catchment management agencies may require establishment of management systems

- 1) A catchment management agency may require in writing that a water user--
 - a) install a recording or monitoring device to monitor storing, abstraction and use of water;
 - b) establish links with any monitoring or management system to monitor storing, abstraction and use of water; and
 - c) keep records on the storing, abstraction and use of water and submit the records to the catchment management agency.
- 2) If the water user fails to comply with a requirement of subitem (1)(a) or (b), a catchment management agency may undertake the installation or establishment of such links and recover any reasonable cost from that water user.

5. Catchment management agencies may require alterations to waterworks

- 1) catchment management agency may, by written notice to the owner or person in control of a waterwork, require that person to collect and submit particular information within a period specified to enable the catchment management agency to determine whether that waterwork is constructed, maintained and operated in accordance with the Act.
- 2) A catchment management agency may direct the owner or person in control of a waterwork at the owner's own cost and within a specified period, to-

- a) undertake specific alterations to the waterwork;
 - b) install a specific device; or
 - c) demolish, remove or alter the waterwork or render the waterwork inoperable in a manner specified in the directive.
- 3) A catchment agency may only issue such a directive if it is reasonably necessary in order to-
- i) protect authorised uses of other persons;
 - ii) facilitate monitoring and inspection of the water use; or
 - iii) protect public safety, property or the resource quality.
- 4) If the owner fails to comply with a directive, the catchment management agency may-
- a) undertake the alterations;
 - b) install the device; or
 - c) demolish, remove or alter the waterwork or render the waterwork inoperable, and recover any reasonable costs from the person to whom the directive was issued.

6. Catchment management agencies may temporarily control, limit or prohibit use of water during periods of water shortage

- 1) If a catchment management agency on reasonable grounds believes that a water shortage exists or is about to occur within an area it may, despite anything to the contrary in any authorisation, by notice in the Gazette or by written notice to each of the water users in the area who are likely to be affected--
- i) limit or prohibit the use of water;
 - ii) require any person to release stored water under that person's control;
 - iii) prohibit the use of any waterwork; and
 - iv) require specified water conservation measures to be taken.
- 2) A notice contemplated in subitem (1) must--
- a) specify the geographical area or water resource to which the notice relates;
 - b) set out the reason for the notice; and
 - c) specify the date of commencement of the measures.
- 3) In exercising the powers under subitem (1), the catchment management agency must--
- a) give preference to the maintenance of the Reserve;
 - b) treat all water users on a basis that is fair and reasonable; and
 - c) consider--
 - i) the actual extent of the water shortage;
 - ii) the likely effects of the shortage on the water users;
 - iii) the strategic importance of any water use; and

- iv) any water rationing or water use limitations by a water services institution having jurisdiction in the area in question under the Water Services Act, 1997 (Act No. 108 of 1997).
- 4) If the owner or person in control of a waterwork contravenes a notice issued under subitem (1), the catchment management agency may--
 - a) modify, or require the owner of the waterwork to modify the waterwork so that it cannot be used to take more water than that allowed for in the notice; or
 - b) remove the waterwork or require the owner to remove the waterwork if the notice contains a prohibition on the use of that waterwork.
- 5) A catchment management agency may recover from the owner any reasonable costs incurred by it in acting under subitem (4).

Schedule 4

Schedule 4 is dealing with the management and planning of water management institutions and. In terms of section 79(2) it is applicable on the ICMA as catchment management agency. All decisions of the ICMA must be taken by the governing board, subject to powers delegated in terms of section 86.

LEGAL FRAMEWORK FOR THE FINANCIAL STRATEGY

The following provisions of the NWA read with the relevant provisions in the National Pricing Strategy should be considered in the financial strategies for the CMS by also looking at when the National Pricing Strategy would be revised to make recommendations on how it should be adjusted to enable the achievement of the objectives of DWA, the ICMA and other WMI's within the WMA of the ICMA:

Chapter 4 Use of Water

Part 2: Considerations, conditions and essential requirements of general authorisations and licences

29. Conditions for issue of general authorisations and licences

- 1) A [responsible authority](#) may attach conditions to every general authorisation or licence--
 - b) relating to water management by--
 - iv) requiring the payment of [charges](#) for water use as provided for in [Chapter 5](#).
 - vi) in the case of a general authorisation, requiring the registration of the water use with the responsible authority and the payment of a registration fee as a pre-condition of that use;

Chapter 4 Use of Water

Part 2: Considerations, conditions and essential requirements of general authorisations and licences

30. Security by applicant

- 1) A [responsible authority](#) may, if it is necessary for the [protection](#) of the [water resource](#) or property, require the applicant to give security in respect of any obligation or potential obligation arising from a licence to be issued under [this Act](#).
- 2) The security referred to in subsection (1) may include any of the following:

- i) A letter of credit from a bank;
 - ii) a surety or a bank guarantee;
 - iii) a bond;
 - iv) an insurance policy; or
 - v) any other appropriate form of security.
- 3) The responsible authority must determine the type, extent and duration of any security required.
 - 4) The duration of the security may extend beyond the time period specified in the licence in question.
 - 5) If the responsible authority requires security in the form of an insurance policy, it may require that it be jointly insured under or be a beneficiary of the insurance policy and where appropriate, the responsible authority must be regarded as having an insurable interest in the subject matter of the insurance policy.
 - 6) A [person](#) may apply in writing to the responsible authority to have any security given by that person in terms of this section amended or discharged at any time, which application may not be unreasonably refused.

Chapter 4 Use of Water
Part 7: Individual applications for licences
40. Application for Licence

- 3) A responsible authority may [charge](#) a reasonable fee for processing a licence application, which may be waived in deserving cases.

Chapter 4 Use of Water
Part 8: Compulsory licences for water use in respect of specific resource
44. Late applications

A [responsible authority](#) may, for good reason, condone a late application and [charge](#) a reasonable additional fee for processing the late application.

Chapter 4 Use of Water
Part 10: Contravention of or failure to comply with authorisations
55. Surrender of licence

- 1) A licensee may offer to surrender any licence issued to that licensee under this Chapter, whereupon, unless there is good reason not to do so, the [responsible authority](#) must accept the surrender and cancel the licence.
- 2) A responsible authority may refund to a licensee any [charge](#) or part of any charge paid in respect of a licence surrendered under subsection (1).

Chapter 5 Financial Provisions

This Chapter deals with the measures to finance the provision of [water resource](#) management services as well as financial and economic measures to support the implementation of strategies aimed at water resource [protection](#), [conservation](#) of water and the beneficial use of water.

Chapter 5 Financial Provisions

Part 1: Water use charges

In terms of part 1 the [Minister](#) may from time to time, after public consultation, establish a pricing strategy which may differentiate among geographical areas, categories of water users or individual water users. The achievement of social equity is one of the considerations in setting differentiated [charges](#). Water use charges are to be used to fund the direct and related costs of [water resource](#) management, development and use, and may also be used to achieve an equitable and efficient allocation of water. In addition, they may also be used to ensure compliance with prescribed standards and water management practices according to the user pays and polluter pays principles. Water use charges will be used as a means of encouraging reduction in [waste](#), and provision is made for incentives for effective and efficient water use. Non-payment of water use charges will attract penalties, including the possible restriction or suspension of water supply from a [waterwork](#) or of an authorisation to use water.

Chapter 5 Financial Provisions

Part 1: Water use charges

56. Pricing strategy for water use charges

- 1) The [Minister](#) may, with the concurrence of the Ministry of Finance, from time to time by notice in the Gazette, establish a pricing strategy for [charges](#) for any water use within the framework of existing relevant government policy.
- 2) The pricing strategy may contain a strategy for setting water use charges--
 - a) for funding [water resource](#) management, including the related costs of--
 - i) gathering information;
 - ii) monitoring water resources and their use;
 - iii) controlling water resources;
 - iv) water resource [protection](#), including the discharge of [waste](#) and the protection of the [Reserve](#); and
 - v) water [conservation](#);
 - b) for funding water resource development and use of waterworks, including--
 - i) the costs of investigation and planning;
 - ii) the costs of design and construction;
 - iii) pre-financing of development;
 - iv) the costs of operation and maintenance of waterworks;
 - v) a return on assets; and
 - vi) the costs of water distribution; and
 - c) for achieving the equitable and efficient allocation of water.
- 3) The pricing strategy may--
 - a) differentiate on an equitable basis between--
 - i) different types of geographic areas;
 - ii) different categories of water use; and
 - iii) different water users;
 - b) provide for charges to be paid by either--
 - i) an appropriate [water management institution](#); or
 - ii) consumers directly;
 - c) provide for the basis of establishing charges;
 - d) provide for a rebate for water returned to a water resource; and
 - e) provide on an equitable basis for some elements of the charges to be waived in respect of specific users for a specified period of time.

- 4) The pricing strategy may differentiate under subsection (3)(a)--
 - a) in respect of different geographic areas, on the basis of--
 - i) socio-economic aspects within the area in question;
 - ii) the physical attributes of each area; and
 - iii) the demographic attributes of each area;
 - b) in respect of different types of water uses, on the basis of--
 - i) the manner in which the water is taken, supplied, discharged or disposed of;
 - ii) whether the use is consumptive or non-consumptive;
 - iii) the assurance and reliability of supply and water quality;
 - iv) the effect of return flows on a [water resource](#);
 - v) the extent of the benefit to be derived from the development of a new water resource;
 - vi) the class and [resource quality](#) objectives of the water resource in question; and
 - vii) the required quality of the water to be used; and
 - c) in respect of different water users, on the basis of--
 - i) the extent of their water use;
 - ii) the quantity of water returned by them to a water resource;
 - iii) their economic circumstances; and
 - iv) the statistical probability of the supply of water to them.
- 5) The pricing strategy may provide for a differential rate for [waste](#) discharges, taking into account--
 - a) the characteristics of the waste discharged;
 - b) the amount and quality of the waste discharged;
 - c) the nature and extent of the impact on a water resource caused by the waste discharged;
 - d) the extent of permitted deviation from prescribed waste standards or management practices; and
 - e) the required extent and nature of monitoring the water use.
- 6) In setting a pricing strategy for water use charges, the [Minister](#)--
 - a) must consider the class and resource quality objectives for different water resources;
 - b) may consider incentives and disincentives--
 - i) to promote the efficient use and beneficial use of water;
 - ii) to reduce detrimental impacts on water resources; and
 - iii) to prevent the waste of water; and
 - c) must consider measures necessary to support the establishment of tariffs by water services authorities in terms of section 10 of the Water Services Act, 1997 (Act No. 108 of 1997), and the use of lifeline tariffs and progressive block tariffs.
- 7) Before setting a pricing strategy for water use charges under subsection (1), the Minister must--
 - a) publish a notice in the Gazette--
 - i) setting out the proposed pricing strategy; and
 - ii) inviting written comments to be submitted on the proposed strategy, specifying an address to which and a date before which the comments are to be submitted, which date may not be earlier than 90 days after publication of the notice;
 - b) consider what further steps, if any, are appropriate to bring the contents of the notice to the attention of interested persons, and take those steps which the [Minister](#) considers to be appropriate; and
 - c) consider all comments received on or before the date specified in the notice.

Chapter 5 Financial Provisions

Part 1: Water use charges

57. Application of pricing strategy

- 1) Water use [charges](#)--
 - a) may be made--
 - i) within a specific [water management area](#); or
 - ii) on a national or regional basis; and
 - b) must be made in accordance with the pricing strategy for water use charges set by the [Minister](#).
- 2) Charges made within a specific water management area may be made by and are payable to the relevant [water management institution](#).
- 3) Charges made on a national or regional basis--
 - a) may be made by the Minister and are payable to the state; and
 - b) may be apportioned between different water management areas according to the extent of the specific benefits which each water management area derives or will derive from the water uses for which the charges are made.
- 4) Any [person](#) liable to pay water charges to a water services institution as defined in the Water Services Act, 1997 (Act No. 108 of 1997), for water supply services or sanitation services may not be charged for those services in terms of [this Act](#).
- 5) No charge made under this Act may be of such a nature as to constitute the imposition of a tax, levy or duty.

Chapter 5 Financial Provisions

Part 1: Water use charges

58 Recovery of water use charges

- 1) The [Minister](#) may direct any [water management institution](#) to recover any [charges](#) for water use made by the Minister under [section 57\(1\)\(a\)](#) from water users within its [water management area](#) or area of operation, as the case may be.
- 2) A water management institution which has been directed to recover any such charges may retain such portion of all charges recovered in order to recompense it for expenses and losses, as the Minister may allow.
- 3) A water management institution which has been directed to recover any such charges--
 - a) is jointly and severally liable to the state with the water users concerned; and
 - b) may recover any amounts paid by it in terms of paragraph (a) from the water users concerned.

Chapter 5 Financial Provisions

Part 1: Water use charges

59 Liability for water use charges

- 1) Water use [charges](#) contemplated in this Chapter--
 - a) may only be made in respect of a water use to which a [person](#) is voluntarily committed; and
 - b) must bear a direct relationship to the water use in question.

- 2) Any person registered in terms of a regulation under [section 26](#) or holding a licence to use water must pay all charges imposed under [section 57](#) in respect of that water use.
- 3) If a water use charge is not paid--
 - a) interest is payable during the period of default at a rate determined from time to time by the [Minister](#), with the concurrence of the Minister of Finance, by notice in the Gazette; and
 - b) the supply of water to the water user from a [waterwork](#) or the authorisation to use water may be restricted or suspended until the charges, together with interest, have been paid.
- 4) A person must be given an opportunity to make representations within a reasonable period on any proposed restriction or suspension before the restriction or suspension is imposed.
- 5) Where there is a fixed charge, a restriction or suspension does not relieve a person of the obligation to pay the charges due for the period of the restriction or suspension.
- 6) A person whose water use is restricted or suspended for any lawful reason may not later claim the water to which that person would otherwise have been entitled during the period of restriction or suspension.

Chapter 5 Financial Provisions

Part 1: Water use charges

60. Water use charges are charges on land

- 1) A [charge](#) made in terms of [section 57\(1\)](#), including any interest, is a charge on the land to which the water use relates and is recoverable from the current owner of the land without releasing any other [person](#) who may be liable for the charge.
- 2) The [Minister](#) or relevant [water management institution](#) must--
 - a) on written application by any person; and
 - b) within 30 days of the application, issue a certificate stating the amount of any unpaid water charges and any interest due in respect of any land.
- 3) If a certificate is not issued within the period of 30 days, the provisions of subsection (1) cease to apply to that property, notwithstanding [section 66](#).

Chapter 5 Financial Provisions

Part 2: Financial assistance

Part 2 deals with financial assistance, which may be granted once certain considerations are taken into account.

Chapter 5 Financial Provisions

Part 2: Financial assistance

61. Financial assistance by Minister

- 1) The [Minister](#) may, subject to a regulation made under [section 62](#), give financial assistance to any [person](#) for the purposes of [this Act](#), including assistance for making licence applications, in the form of grants, loans or subsidies, which may be made subject to such conditions as the Minister may determine.

- 2) The financial assistance must be from funds--
 - a) appropriated by Parliament; or
 - b) which may under this Act or otherwise lawfully be used for the purposes in question.
- 3) Before giving any financial assistance, the Minister must take into account all relevant considerations, including-
 - a) the need for equity;
 - b) the need for transparency;
 - c) the need for redressing the results of past racial and gender discrimination;
 - d) the purpose of the financial assistance;
 - e) the financial position of the recipient; and
 - f) the need for [water resource protection](#).
- 4) A person who wilfully fails to comply with any obligations imposed by this Act is not eligible for financial assistance under this Act.

Chapter 5 Financial Provisions

Part 2: Financial assistance

62. Regulations on financial assistance

The [Minister](#) may make regulations concerning--

- a) the eligibility for financial assistance;
- b) the manner in which financial assistance must be applied for; and
- c) terms and conditions applicable to any financial assistance granted.

Chapter 6 General Powers and Duties of Minister and Director-General

Part 3: Powers relating to catchment management agencies

73. Assignment of powers and duties to catchment management agencies

- 1) The [Minister](#) may, after consultation with the [catchment](#) management agency concerned, by notice in the Gazette, assign to that catchment management agency-
 - a) a power or duty of a [responsible authority](#); and
 - b) any power or duty listed in [Schedule 3](#).
- 2) In assigning any power or duty under subsection (1), the Minister may--
 - a) limit the area within which an assigned power may be exercised or duty may be performed; and
 - b) attach conditions to that assignment.
- 3) Before assigning a power or duty to a catchment management agency under subsection (1), the Minister must consider--
 - a) the capacity of the catchment management agency to exercise the power or perform the duty; and
 - b) the desirability of assigning that power or duty.
- 4) The Minister must promote the management of water resources at the catchment management level by assigning Powers and duties to catchment management agencies when it is desirable to do so.

Chapter 7 Catchment Management Agencies

Part 3: Operation of catchment management agencies

84. Funding of catchment management agencies

- 1) A [catchment](#) management agency may raise any funds required by it for the purpose of exercising any of its powers and carrying out any of its duties in terms of [this Act](#).
- 2) A catchment management agency must be funded by-
 - a) money appropriated by Parliament;
 - b) water use [charges](#); and
 - c) money obtained from any other lawful source for the purpose of exercising its powers and carrying out its duties in terms of this Act.

IRRIGATION BOARDS AND WATER USER ASSOCIATIONS

Irrigation boards and WUA's are self sufficient and the funding of irrigations boards are done in terms of the Water Act 56 of 1954. Tthe funding of the WUAs is done in terms of the NWA (according to the purport of Chapter 8).

WATER BOARDS

Water Boards are financed in terms of the Water Services Act, 1997.

DWA

DWA is financed from the national revenue fund as a government department.

TRANSITION IN RESPECT OF WATER USE CHARGES

Provision should be made in the financial sub strategy for the water use charges to be made and recovered within the WMA of the ICMA and no longer on a national or regional basis. See section 57 of the NWA above.

As can be seen from above the legislative framework in respect of the finance sub strategy is much wider than section 56 of the NWA and the National pricing Strategy for Raw Water. It is trusted that the above inputs would give guidance towards the finalisation of the financial sub strategy in the CMS.

OVERVIEW OF THE PUBLIC FINANCE MANAGEMENT ACT

The ICMA is a public entity listed in Schedule 3A and the governing board is its accounting authority with the powers and duties as reflected in Chapter 6. The National Treasury Regulations apply to the ICMA as Schedule 3A public entity to the extent as indicated in paragraph 6.1.2 of the Regulations and regulations 16, 16A, 24 to 28 and 30 to 33 which deal with the following:

- 6.1.2 Receipt of transfers appropriated by vote
16. Public-private partnerships
- 16A Supply chain management
24. General definitions

25. Application and listing
26. Responsibilities of designated accounting officers
27. Internal control and corporate management
28. Annual financial statements and annual reports
30. Strategic planning
31. Cash, banking and investment management
32. Borrowings
33. Financial misconduct

APPENDIX C

INTERNATIONAL ASPECTS

APPENDIX C: INTERNATIONAL ASPECTS

PRIMA IAAP PROJECT DETAILS AND STATUS

IAAP 1 – Shared Watercourse Institutions

Main Activities

Shared Watercourse Institutions – Road Map for Implementation of IAAP 1

Short-Term Missions / Studies for Institutional Arrangements

Comprehensive Legal and Institutional Analysis;
Development of Powers and Rules of TPTC;
Development of Procedural Rules for Treaty Monitoring, Compliance and Enforcement;
Treaty Amendment for Establishment of a permanent Shared Watercourse Institution;

Coordination of Trans-boundary Activities (Acting as Secretariat)

Implementation of Case Studies;
PRIMA as platform for overall implementation of IIMA;
Interaction with local stakeholders;

Exchange of Experiences;

Approaching potential donors and partners:

Status to Date

Road Map prepared for IAAP 1 –
(see also **PRIMA Implementation Plan**)

Preparations for Draft ToR;
(Oct/Nov/Dec 2009 – Meetings with Pegasus, Orasecom, Limcom, SADC, Okacom and TSG);

Nov 2009 – First Case Study held;
Sept 2009 – Low Flows in Maputo River;

May/June 2009 – Visit ICMA ARA-Sul, Swaziland, Dutch Waterschappen to Mozambique and the Netherlands;

Nov 2009 – Presentation PRIMA to KOBWA

(Planned Study Tours – Visiting other RBOs)

Nov/Dec 2009 – RNE (Low Flows Maputo

IAAP 2 – Review of National Water Policies and Legislation

Status to Date

This project will be outsourced, but still needs funding. Terms of Reference will be prepared in February/March 2010.

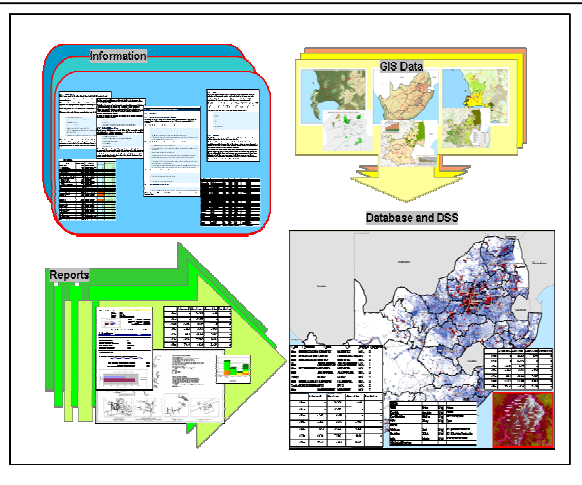
IAAP 3 – Project on Integrated Water Resources Management

Expected Project Results:

Data Base and Decision Support System;
 Baseline Evaluation and Scoping Report;
 Basin Management Alternatives and Feasibility Report;
The PSP will assure synergy between all PSP projects

Facts and Status to Date:

1 – *Implementing Consortium*
 AURECON, Pegasus, Water for Africa
 2 – *Implementation Period*
 1 September 2009 until 31 January 2011
 3 – *Status to date*
 Report in both English and Portuguese
 Inception Report (draft)
 1 workshop held



IAAP 4 – Augmentation of the Water Supply for the City of Maputo and Metropolitan Areas

Facts and Status

1 – *Implementing Consortium*
 SWECO, Consultec, BKS, DHI
 2 – *Implementation Period*
 1 October 2008 until 31 December 2009
 3 – *Status till Date: Finalized*
 Deliverables
(Report in both English and Portuguese)
 Inception Report
 Water Demand Report;
 Water Availability Report;
 Water Balance Report;
 Water Supply Strategies for Greater Maputo Area until 2030;
 Final Project Report;
 6 workshops and 3 two-day training courses;

Facts and Status

4 – *Main Conclusions*
 Two Strategies
 Strategy 1:
 Short-term – Corumana Dam and Groundwater
 Long-term – Feasibility Study required
 Strategy 2:
 Short-term – Maputo River upstream Salamanga and Groundwater
 Long-term – Feasibility Study required
 5 – *Way Forward*
 Design, tendering and securing funds for short-term solution;
 Feasibility Studies for long-term solutions;
 Finalization of water sharing agreements;
 Decision on long-term strategy;

IAAP 5 – Project on Disaster Management Plan for the Incomati and Maputo Watercourses

Expected Project Results:
Disaster preparedness plans for each river basin; (flood preparedness; drought preparedness; preparedness for pollution)
Emergency response protocols for each river basin;
Mitigation preparation plans for each river basin;
Description of the role of a future secretariat in the international coordination of the Disaster management process;
 Development and provision of a **web-based Disaster Management and information tool**;
Instruction and training events;

Facts and Status to date:
 1 – *Implementing Consortium SRK, AURECON, NETGroup, Golder, Watees, Umtata, Mike Muller*
 2 – *Implementation Period 1 August 2009 until 31 July 2011*
 3 – *Status to date (Report in both English and Portuguese) Final Inception Report submitted 1 workshop held*

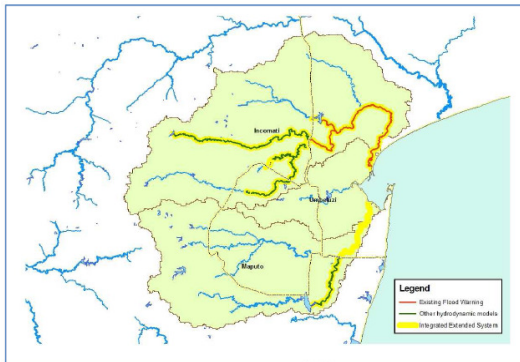


Figure 4-9: Extents of flood modeling.

IAAP 6 – Trans-boundary Impacts in the Incomati and Maputo Watercourses

Status to Date
 This project will be outsourced, but still needs funding. Terms of Reference will be prepared in February/March 2010.

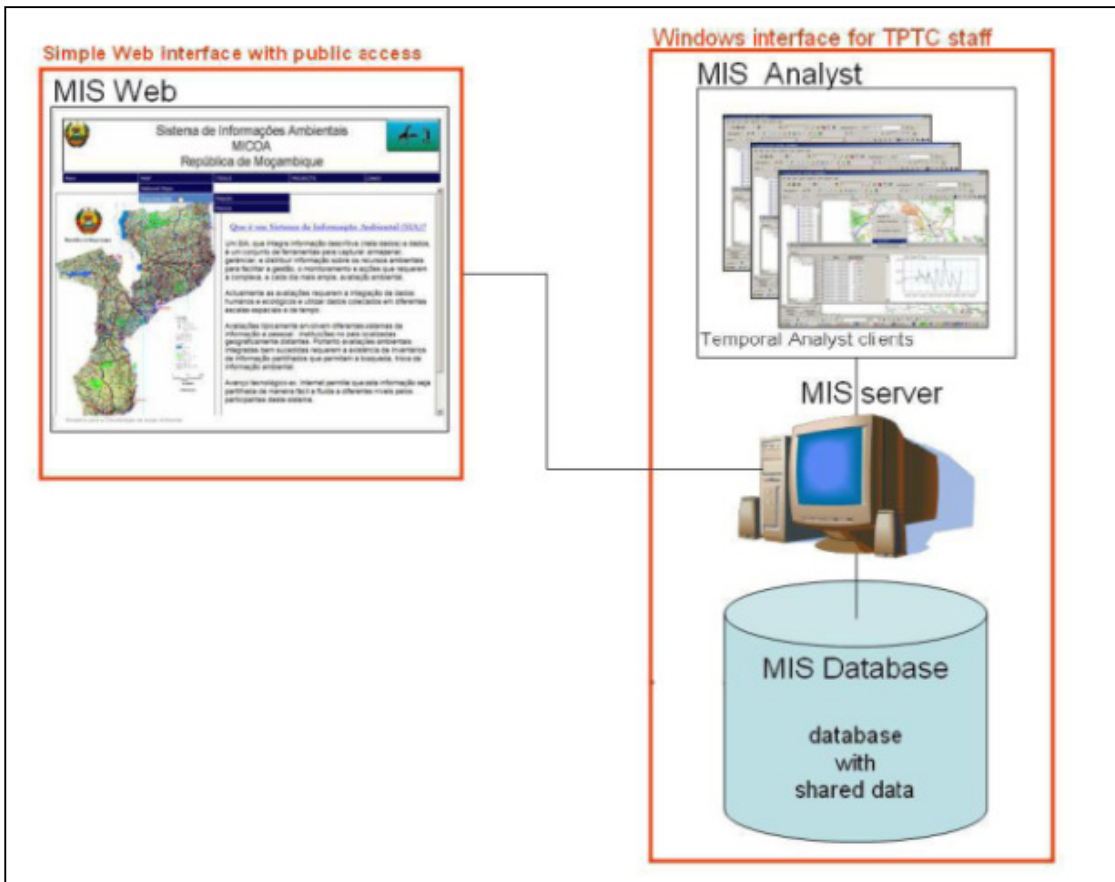
IAAP 7 – Exchange of and Access to Information

Expected Project Results:

Report on Data and Information Requirements, Availability and Acquisition;
Plan for the collection of missing information;
Plan for enhancement of (joint) monitoring networks;
Plan for enhancement of the laboratories;
Plan for enhancement of databases;
Management Information System;
Mechanism for mutual Exchange of and Access to Data and Information;
Development of Disbursement Plan for Capital Investment;
Training program;

Facts and Status:

1 – Implementing Consortium
DHI, SWECO, Consultec, BKS
 2 – Implementation Period
1 February 2009 until 31 January 2011
 3 – Status to date
(Report in both English and Portuguese)
Inception Report;
Report on Data and Information;
Requirements, Availability and Acquisition (draft);
Plan for enhancement of laboratories (draft);
Plan for enhancement of databases (draft);
2 workshops held;



IAAP 8 – Capacity and Confidence Building

Main Activities

Development of a Capacity Building and Training Plan (CB&T Plan)

Draft Plan has been developed and provides guidelines on how to use the PRIMA Training Budget;

Before implementation, the following was required:

Implementation of the Capacity Building and Training Plan

Organization of training courses / participation in existing events;

Monitoring the implementation of the CB&T Plan;

Evaluation of the CB&T Plan;

Status to Date

Approved by the Task Team

Agreement on objectives / conditions of the CB&T Plan;

Agreement on the *PRIMA Training Plan*;

Agreement on the proposed candidates for participation;

List of potential candidates for attending the training program;

Main stakeholders will appoint focal points and staff to be involved in the PRIMA Training Plan;

IAAP 9 – Stakeholder Participation and Communication

Expected Project Results:

Detailed Stakeholder Analysis;

Strategy for a joint stakeholder participation program;

Strategy for a stakeholder participation program, to be implemented by each member State separately, developed;

Public Awareness Campaigns for each member State separately and a joint Public Awareness Campaign, developed;

Plan for stakeholder involvement, required for the preparation of the Comprehensive Agreements developed;

Training program;

Facts and Status:

1 – Implementing Consortium
BRLi, COWI, AustralCOWI

2 – Implementation Period
1 January 2010 until 31 March 2011

3 – Status to date
Start of Inception Phase

IAAP 10 – Stakeholder Participation and Communication

Expected Project Results:
System Operating Rules Status Report;
An Operating Rules Information Management and Decision Support System
 for setting short, medium and long-term operational rules (until 2030);
Proposal for Integrated Operating Objectives for both Watercourses;
(general operating rules)
ToR for tri-lateral System Operation Task Groups;
Training program;

Facts and Status:
 1 – Implementing Consortium
AURECON, DHI, Salomon
 2 – Implementation Period
1 December 2009 until 28 February 2011
 3 – Status to date
(Report in both English and Portuguese)
Inception Report (draft)



IAAP 11 – Preparatory Work for Comprehensive Water Use Agreements for the Incomati and Maputo Watercourses

Main Activities

Consolidation of IIMA Reports and Development of an Integrated Program;
 Production of bankable project documents;
 Interesting donors for funding;

Report on Lessons Learnt and Opportunities IIMA;

Status to Date

Behind schedule – Planned for Febr. 2010;

Behind schedule – Planned for Febr. 2010; After production of bankable documents, but some donors showed already interest; Planned for 2011;

IAAP 12 – Managing the Implementation of IIMA

Main Activities	Status to Date
<p>Operational Support to TPTC Management of PRIMA Program; Running of PRIMA Office;</p>	<p>On-going; On-going;</p>
<p>Support to PRIMA Management Development of PRIMA Implementation Plan; Setting-up standard progress reports; Preparing PRIMA progress reports and year plan; Elaboration of Final Report PRIMA Program;</p>	<p>Sept 2008 – Finalized; Sept 2008 – Done; Until first semester 2009 and Plan 2010; Planned for 2011;</p>
<p>Monitoring of 6 PSP Projects Preparation of ToRs and RfPs; Implementation of Tender Procedure;</p> <p>Attending PSC Meetings; Commenting on Inception, Technical and Final Reports; Participation in Technical Workshops; Participation in Training Events; Financial Administration; Preparation of Report on Evaluation of PSP Projects; Recommendations – Way Forward; Dissemination of Results;</p>	<p>Strong involvement of all Parties April/May and July/Sept 2008 – Finalized; April-July 2008 and April-July 2009 – Finalized; On-going (12 held to date); On-going (15 reports to date);</p> <p>On-going (11 held to date); On-going (3 events organized to date); On-going; Planned for 2011;</p> <p>First project <i>Maputo Water Supply</i>; Starting for the project <i>Maputo Water Supply</i>;</p>
<p>Supports to IAAP Projects, coordinated by PRIMA Preparation of Road Map for IAAP 1 and coordination of implementation; Development and Implementation of Capacity Building and Training Plan; Preparation of IAAP 11 and arranging funds for implementation of proposed projects; Preparation of Case Studies; Installation of Virtual Workspace;</p>	<p>Ongoing – started in October 2009;</p> <p>On-going – started in 2008;</p> <p>Behind Schedule – planned for February 2010; Nov 2009 – First Case Study held; Planned for February 2010;</p>

APPENDIX D

VISIONING APPENDICES

APPENDIX D: VISIONING APPENDICES

APPENDIX D1: AWARENESS AND CAPACITY BUILDING CAMPAIGN

Every effort was made to ensure that the CMS development process was guided by stakeholder contributions and desires. The workshops were well advertised on radio and in local news papers, pre-workshop sessions were held with disadvantaged stakeholders to facilitate better participation and ICMA staff acted as interpreters at each of the workshops.

Table D1: The schedule of radio and newspaper advertisements of the CMS workshops

	Details of Advertisement	Date of advertisement
Radio Laevelde	3X per day for 3 days	10-12/ 02/10
Ligwalagwala FM	3X per day for 3 days	10-12/ 02/10
Munghana Lonene FM	3X per day for 3 days	10-12/ 02/10
MPower FM	7X per day for 3 days	10-12/ 02/10
Lowvelder	1X per week for 2 week	05/02/10 and 12/02/10
Mpumalanga News	1X per week for 1 week	11/02/10

Pre-workshop sessions for disadvantaged stakeholders

Over time ICMA staff have developed a comprehensive list of stakeholders and representatives who would face particular challenges during open participation workshops. This list includes historical disadvantaged emerging farmers, many of whom are illiterate or semi-literate, and literate stakeholders who have little or no knowledge of water resource management. Three pre-workshops sessions were held, one in each sub-catchment, to assist these people in their preparation for the full Visioning Workshops.

Transport was organised for those who needed it and the workshops were facilitated in their own languages. The focus was on helping the stakeholders to understand the CMS orientation document and the role they should play in the visioning workshops. We are very grateful for the collaboration received from the Department of Agriculture and Land Affairs who identified additional stakeholders in need support and arranged transport for them to the sub-catchment visioning workshops.

INVITATIONS

The Inkomati Catchment Management Strategy

Invitation to
Participate in
the Process to Develop the
Inkomati Catchment Management Strategy



3rd Floor Caltex Building, 32, Bell Street, Pietermaritzburg, 6001, Tel: 013-753 9000; Fax: 013-753 2786

INKOMATI CATCHMENT MANAGEMENT AGENCY

Your Decision Making Opportunity!

The Inkomati Catchment Management Agency (ICMA) exists to support the achievement of **sustainability, equity and efficiency** of water use through Integrated Water Resources Management in the Inkomati Water Management Area (WMA).

The ICMA must develop a **Catchment Management Strategy (CMS)**, collectively with its **Stakeholders**, that decides upon a shared desired future and designs the strategic water resource management actions required to achieve it. The ICMA is pioneering an adaptive approach to CMS development and implementation and is inviting you to be a part of it.

Thus, any person, or their representative organization, whose activities affect or might affect water resources within the Inkomati, and who have an interest in the content, effect or implementation of the CMS are invited to participate in the process.

A **Stakeholder Orientation Workshop** that will provide further details on this decision making process will be held on **15 February 2010** at **Ngwenyama Lodge in White River** from **10h00**. It will be followed by 3 sub-catchment workshops and a final Strategy Workshop, the details of which will be provided at the Orientation Workshop.

Stakeholder Orientation & Programme Outline Workshop:

Date: 15 February 2010

Venue: Ngwenyama Lodge, White River; 10h00-16h00



INKOMATI CATCHMENT MANAGEMENT AGENCY

To RSVP or for more information contact:
Brian Jackson or Liketso Khaile
Tel: 013-753 9000
E-mail: jacksonb@inkomaticma.co.za;
khailel@inkomaticma.co.za

Invitation Used for Stakeholder Orientation Workshop

The Inkomati Catchment

Management Strategy

Invitation to

Participate in the Development of the
Inkomati Catchment Management Strategy



3rd Floor CallEx Building, 32 Bell Street, P/Bag X11214, Nelspruit, 1200; Tel: 013-753 9000; Fax: 013-753 2786

INKOMATI CATCHMENT MANAGEMENT AGENCY

The Inkomati Catchment Management Agency (ICMA) exists to achieve the **sustainable, equitable** and **efficient** management of water resources in the Inkomati water management area.

The ICMA is facilitating the development of a **Catchment Management Strategy**, which will provide the framework for integrated water resource management. This framework will be based on the outcomes of a **visioning process** during which stakeholders will map out their desired route to a more equitable, efficient and sustainable water-use future.

Three different visioning workshops will be held, one for each of the three sub-catchments of the Inkomati: the Crocodile, the Komati and the Sabie-Sand. A team of experts will use the outcomes of these workshops as guidance in developing draft management strategies, which will in turn be discussed with stakeholders at a fourth integration workshop. **Stakeholders from each sub-catchment are invited to attend their relevant workshop(s):**

- **Crocodile sub-catchment visioning workshop, Tuesday 9th March**
Protea Hotel The Winkler, White River. 8.30am for 9am.
- **Komati sub-catchment visioning workshop, Wednesday 10th March**
Ngwenya Lodge, Komatipoort. 8.30am for 9am.
- **Sabie-Sand sub-catchment visioning workshop, Friday 12th March**
Mthunzi Lodge, Hazyview. 8.30am for 9am.
- **Inkomati final strategy workshop, Wednesday 24th March**
Details to be confirmed.

Participation in visioning workshops requires a sound understanding of the STEEP (Social, Technological, Economic, Environmental, and Political) characteristics of the sub-catchment. The ICMA is thus collating the relevant information, and this will be shared with participants before the workshops. Please provide full details of how the ICMA can send you this information.

If you intend participating in this process please commit to attending all the relevant workshops and to familiarising yourself, before each workshop, with the information we send you. **Please RSVP with this commitment by Friday 26th February at the latest.**

Please note that these important workshops will begin on time, as scheduled. Late-comers will have to accept responsibility for any disadvantage they experience during the proceedings.



INKOMATI CATCHMENT MANAGEMENT AGENCY

To RSVP or for more information contact:
Liketso Khaile or Brian Jackson
Tel: 013-753 9000
E-mail: khaile@inkomaticma.co.za
jacksonb@inkomaticma.co.za

Invitation used for Visioning Workshops

APPENDIX D2: PROCESSES OF CMS DEVELOPMENT AND PROPOSED STAKEHOLDER ENGAGEMENT/VISIONING

Slide 1:

The Inkomati Catchment Management Strategy

A Stakeholder Centred Process for the Inkomati Catchment Management Strategy

15th February 2010
Orientation Workshop

Crocodile 9th March and
 Komati 10th March
 Sabie/Sand 12th March

Integration workshop 24th March 2010

Chapter 1: Stakeholder Orientation Document Part A: Foundation Information

Slide 2:



Slide 3

The Inkomati Catchment Management Strategy

What is a Catchment Management Strategy (CMS)

A set of medium to long term strategic action programmes to achieve catchment water use that is equitable, efficient and sustainable

Chapter 1: Stakeholder Orientation Document Part A: Foundation Information

Slide 4

The Inkomati Catchment Management Strategy

The 10 Steps to a CMS

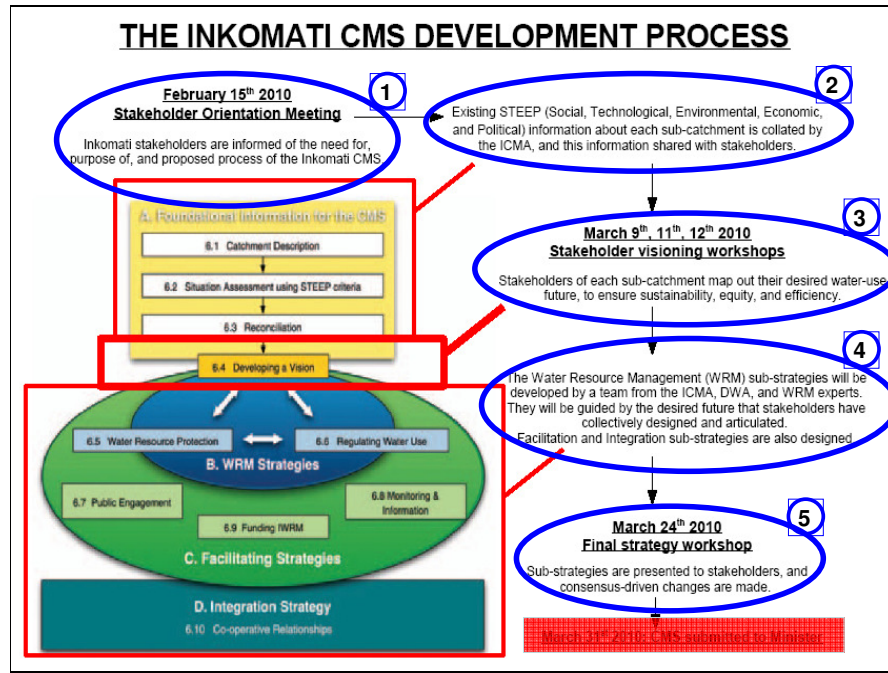
- Catchment Description
- Situation Assessment
- Reconciliation
- **Viewing**
- Water Resource Protection Sub-strategy
- Regulating Water Use Sub-strategy
- Public Engagement Sub-strategy
- Monitoring and Information Management Sub-strategy
- Funding Sub-strategy
- Co-operative institutions, governance and partnerships Sub-strategy

Chapter 1: Stakeholder Orientation Document Part A: Foundation Information

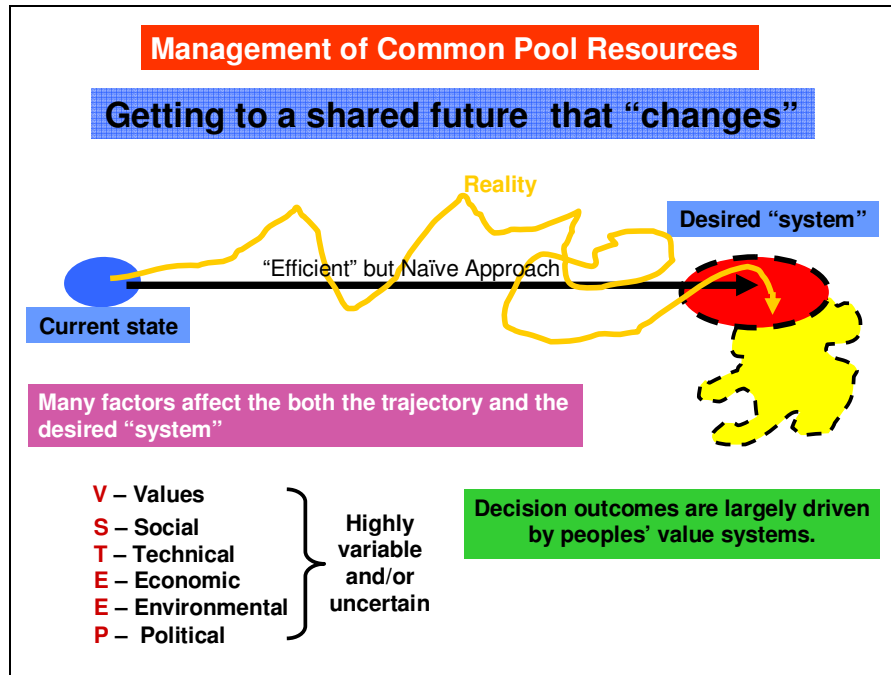
APPENDIX D: Visioning

APPENDICES

Slide 5



Slide 6



The Inkomati Catchment Management Strategy

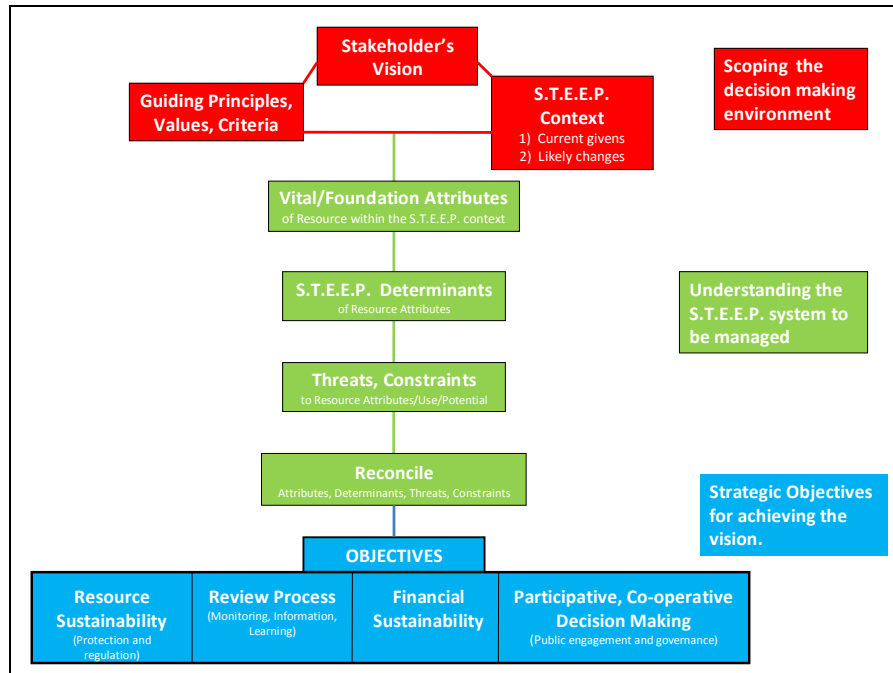
A Stakeholder Centred Process for the Inkomati Catchment Management Strategy

Our purpose today?

Use the planning process to propose a path towards more equitable, efficient and sustainable use of water.

Provide guidance to the technical team that will draft a Catchment Management Strategy to achieve this end

Chapter 1: Stakeholder Orientation Document Part A: Foundation Information



**The Inkomati Catchment
Management Strategy**

**A Stakeholder Centred Process for the
Inkomati Catchment Management Strategy**

1. **Everyone** will be able to, and needs to, give their own **perspective** on any issue. We (the other participants) will **accept** it as their perspective
2. We can all ask **questions** of each other to seek **clarification** at anytime
3. The best way to achieve what you need is to **help others** get what they need.
4. **Seek first to understand THEN to be understood.**
Listen first then speak to get your point across.

Chapter 1: Stakeholder Orientation Document Part A: Foundation Information

APPENDIX D3: ADAPTIVE PLANNING FOR STRATEGIC ADAPTIVE MANAGEMENT: TRANSLATING VISION INTO ACHIEVABLE OBJECTIVES

This protocol provides a step-by-step process for decomposing the vision into a series of “objectives” of increasing focus, rigour and achievability.

Procedural tips are given in text boxes for each protocol step. This protocol should ideally be implemented in a workshop environment with the assistance of a facilitator who is familiar with both the protocol and consensus facilitation.

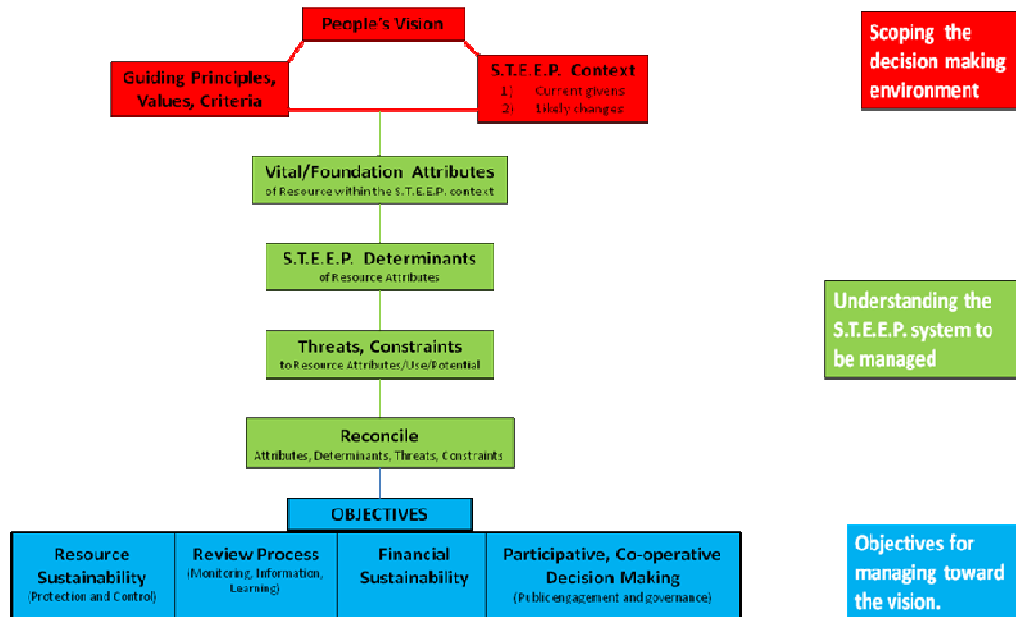


Fig D3-1 A strategic planning framework for translating vision into achievable objectives

Scoping the Decision Making Environment

Step 1. Reach consensus on the vision, values, guiding principles, criteria

In this context a vision is a concise statement describing an institutions’ core business and philosophy of management, whereas a statement of the operating principles describes the core values of the “institution” in terms of managing the resource.

This is one step at which value and needs-based negotiation (See Guide to building cooperation) is essential. Identify the key elements of the vision and develop operating principles for each.

Since the operating principles describe core institutional values they should be used as checks and balances at each step of the protocol.

Step 2. Provide the context for setting the objectives

Describe the context of/for the system to be managed, at local, regional, national and international scales and in S.T.E.E.P (Social, Technical, Environmental, Economic, and Political) terms.

This step requires considerable brainstorming, knowledge of the literature, local conditions and policies, governmental policies and international agreements. It is important to involve all stakeholders in building this context to ensure common understanding as a base for future negotiations.

Understanding the S.T.E.E.P. system to be managed

Step 3. Document the vital attributes of the resource/system

List the known and perceived, current and future vital attributes of the system.

Current attributes may be determined from inventory type lists of STEEP characteristics. Scenario modelling may be useful for identifying future attributes.

The next step is to discuss and evaluate these lists to reduce them to the essential elements compatible with the vision.

Step 4. Record the determinants of, and constraints and threats to, the vital attributes

A major purpose of management is to ensure the maintenance of the determinants of the vital attributes. List the determinants of, and the constraints and threats to, the condensed list of vital attributes. Knowledge of the environmental and cultural “goods and services” the system has the potential to deliver is essential to this step. A matrix can be set up to facilitate the process of assigning determinants, threats and constraints to the particular attributes.

Step 5 Reconcile the Attributes, Determinants, Threats and Constraints

Matrices are a useful tool in exploring which attributes, determinants, threats and constraints appear to be complementary and those that are conflicting. The end product should be a concise list of vital attributes for which the catchment would be managed.

This is an important step in the objective setting process as it identifies the fundamental purpose(s) of management for a particular resource.

It is essential that everyone's perceptions of the strengths/vital attributes are aired.

Encourage participants to put their “cards on the table” to produce a provisional list of their perceptions of the vital attributes, without debating their merits. Then reduce the list by eliminating those incompatible with each other, or the vision.

Expert opinion is needed for this important step but do not let it be constrained by the lack of site specific knowledge. Use experts across the V-STEPP spectrum where you can. Develop hypotheses of determinants if they are not known. This is invoking an adaptive approach to management which will test their importance over time.

Personal values play an important role in this step as long held assumptions about what is “vital” or a threat, etc. in a catchment need to be discussed and supporting evidence found.

Techniques such as ordination, congruency, optimization, linkage and interaction may be used if round table discussion does not resolve the issues.

Strategic Objectives for achieving the Vision

Step 6. Formulate the high level objectives

Objectives are set to;

- 1) ensure the maintenance of the identified vital attributes of the system being managed, and
- 2) overcome the constraints and threats to meeting the vision.

A hierarchical approach should be adopted to formulate a set of nested objectives of increasing rigour and achievability. Note that this is an iterative process of identifying, structuring and analysing objectives, and understanding how they relate to each other.

Repeatedly cross reference the vision, principles, context and vital attributes with constraints and threats to set up statements of intent to ensure vital attributes are maintained by overcoming threats and constraints.

Several devices can help stimulate formulation of objectives:

1. Drawing up a wish list.
2. Use of alternatives.
3. Identifying problems and shortcomings - articulate reasons for concern.
4. Identify consequences of existing objectives and management actions.
5. Use of different perspectives.

Step 7. Prioritize the high level objectives

Prioritising objectives is both difficult and subtle. Use the vision, strengths, principles and context as a basis to prioritize the objectives. They provide the checks and balances.

Negotiation is an important tool. Not all the objectives will stand up to this process and there will be many perceptions of what is most important.

The preceding steps of the protocol have set a good foundation though. Use this information to give the checks and balances needed to rationally prioritize the objectives. Do not do it by vote as this often reduces decisions to gut feel or personal agendas.

Step 8. Set lower level objectives

Construct an **Objectives Hierarchy** by decomposing the higher level objectives into sub-objectives of increasing focus, rigour and achievability. The final level represents acceptable, achievable and measurable objectives.

Use the same procedure as for formulating objectives (Step 6) to sub-divide objectives into smaller and smaller, units until the statement ceases to describe an intent and becomes one of "what must be done". You have set the final objectives when clear statements of the temporal, spatial and resource limits have been identified.

There is also a need to **prioritise these lower level objectives**. Different degrees of rigour can be given to the time frame of different priorities.

The most difficult task is to ensure that the smallest number of objectives is set to achieve a particular high level objective. Remember, the purpose is to maintain vital attributes by overcoming constraints and threats.

APPENDIX D4: THE OUTCOMES OF STAKEHOLDER VISIONING WORKSHOPS FOR EACH OF THE SUB-CATCHMENTS.

Inkomati Catchment Management Strategy Visioning Exercise CROCODILE RIVER SUB-CATCHMENT 9 March 2010

Facilitator: Prof Kevin Rogers

The facilitator introduced the customised Adaptive Planning Process and explained how this process would provide the insight on stakeholders' perspectives of a desired future state for the Crocodile sub-catchment. In so doing stakeholders were providing guidance to the technical team that would draft the catchment management strategy (CMS). This team will comprise ICMA and DWA staff, as well as a range of external experts. The first draft CMS would be circulated to stakeholders and again workshopped with them on 24 March 2010. The plan would then be submitted to the Minister DWA for approval.

This document represents the outcome of the first stakeholder (public participation) meeting for the Crocodile River Sub-catchment of the Inkomati Catchment.

Key issues raised by stakeholders

1. Protection, control and management of the resource
2. Sustainable use and development regarding quality and the decision making process
3. Implementation of the reserve
4. Water available for economic growth and urban use
5. How can we have fairness in times of low supply (drought)
6. Role of local individuals in water resource management
7. Development
8. Economic Development – governance: how can we work together
9. How does the process of sustainability work?
10. The current resource status
11. Strengthening institutional relations
12. Future scenario of water use
13. Privatized water reserves/infrastructure, and equity – how can they be shared
14. Assurance of supply
15. Effective community use of water
16. Shortage of water in this country and yet exporting it to other countries
17. How do we go about dealing with issues of water rights and licensing?
18. How is our strategy coming in line with the WSDP
19. Concerned that local authorities are not dealing with water saving technologies / management
20. Stop talking – start building infrastructure
21. Allocation of water, especially to agriculture
22. Delegation of responsibilities such as monitoring of information
23. Climate change issues
24. Water allocation, sustainability
25. How do we decide what is fair and equitable?

26. Management of alien vegetation
27. How important is irrigation and reservoirs for irrigation farmers?
28. Recognizing the importance of the National Freshwater Priority Areas
29. What are we doing about conserving more water and building more dams?
30. How do we communicate all the issues dealt with today?
31. Community awareness of what is dealt with today. Not to just change for change itself
32. Classification – land use
33. How can we distribute equitably without meters?
34. Affordability – water management
35. Water management for the tourism management and biodiversity
36. Lack of realization about the connections between the landscape, the rivers, and ensuring health for the people
37. As first CMS, can we move and rise up to the challenge
38. Make people and stakeholders be aware of what CMS is?
39. Shared understanding of water resource management
40. Taking ownership and responsibility of the CMS
41. Strengthen the support of water services
42. Setting a trend for managing the sustainability of the water resources
43. Effective tariffs
44. Infrastructure development (dams) for emerging farmers and that water does not flow to Mozambique
45. Engagement on more dams for emerging farmers
46. Refurbishment of existing infrastructure
47. Management of coal mining in the upper Komati
48. Active identification in public participation in the water resource management
49. How is the strategy going to address spatial coordination
50. Reconciliation strategies
51. Require political will and buy-in
52. Enforcement and compliance
53. Education to the future
54. Pollution of underground water
55. Alignment with the National Water Resource Strategy
56. Conjunctive use of water, ground water and rain harvesting
57. Incentives and dis-incentives / sustainable land use / incentives for conservation of water
58. Maintain ecosystem goods and services
59. Measure on water quality
60. Financial implications of the strategy
61. Environment is not maintained properly thus experiencing problems
62. Safety precautions taken around dams and reservoirs – people committing suicide
63. Wetlands
64. Waste water treatment works
65. Water summit involving neighboring countries involving building more dams

Vision

A vision is a concise statement describing the shared desire for the future conditions of the sub-catchment.

A water resource that is:

Shared equitably and sustainably in terms of quantity, quality and finances

Managed adaptively, co-operatively and progressively to achieve social, economic and environmental justice, and promote healthy living

Values

Our values are the principles we use to evaluate the consequences of actions (or inaction), to propose and chose between alternative options and decisions. The sub-catchment value set reflects the values shared by the stakeholders of the sub-catchment.

- We acknowledge the interdependence of stakeholders within and without the catchment.
- Management must be adaptive and outcomes driven, with solutions being simple, practical and implemented.
- Decisions, actions and outcomes are subject to performance review using measurable indicators.
- Decision making must be participatory, transparent and consensus based to build trust and cooperation between stakeholders.
- Decisions must be well informed to ensure they are credible and legitimate.

Context

The range of social, technical, economic, environmental and political facts, conditions, causes and surroundings that define the circumstances relevant to a problem, provide the "context" within which decisions are made. The context is therefore a fundamental element of any decision making environment.. Please refer to the Stakeholder Orientation Document, available on request.

Vital Attributes

The few most important characteristics/properties of the system to be managed are its "vital attributes". They may be may be technical, ecological, legal, historic, social or economic.

- The wide range in altitude between escarpment and the Mozambique border dictates the distribution of rainfall, evapotranspiration and runoff with wetter cooler conditions in the west, and hotter drier conditions in the east.
- This range is accompanied by a diverse and scenic mosaic of landscapes and land uses on generally fertile soils.
- The very high biological diversity is complemented by high cultural diversity, a rich heritage and unique petrology (oldest rocks and signs of life in the world).
- The sub-catchment has very high urban growth because it straddles the Maputo Development Corridor and contains the Mpumalanga Capital (Nelspruit).
- The economy has a strong base in agriculture, forestry, government, tourism and mining and all these activities are inextricably tied to the Crocodile River and its tributaries.
- There are still large disparities in access to water and in the economy.
- There is good irrigation infrastructure on the whole but with only one large dam (Kwena), management is largely limited to run-of-river.
- Knowledge of, and expertise in, Water Resource Management is high.

- There are a large number of land claims covering a large area of the catchment, many of which have been resolved.
- The Crocodile River is an important source of water for Mozambique.

Threats

Threats are factors within, or outside, a partnership that undermine its values and inhibit the pursuit of the vision. Threats are also factors or processes that inhibit ecosystem determinants or vital attributes.

- A large area covered by a large number of alien plant species.
- The river is oversubscribed under a poor and unimplemented allocation policy/plan
- Continued poor landuse planning is a very important threat. This includes: Uncontrolled and/or poorly planned rural and urban growth leading to pollution of both surface and ground water; degradation of riverine areas and the scenic mosaic; uncontrolled tourism development and poor/inappropriate landuse practices; continued circumvention of regulations by developers and mining.
- A continued lack of solid and liquid waste management.
- Non-implementation of the Reserve and aseasonal flows from the Kwena River are undermining the sustainability of the resource.
- Continued inefficiencies in irrigation practices, which lead to excessive water use and pollution.

Objectives

Objectives should be aimed at overcoming threats to ensure the persistence of vital attributes and/or their determinants, under the guidance of the vision statement.

The primary objective must be to achieve full delegation of authority to the ICMA so that they can complete the licensing process and begin practicing IWRM to achieve equity, efficiency and sustainability of water use.

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Sustainability

- Increase the water yield by developing new infrastructure and eradicating alien vegetation.
- Water use is fully metered/measured, monitored and compliant
- Targets are set and a process for implementing the Reserve put in place which includes full integration of the National Freshwater Ecosystem Priorities.

Funding

- Develop a transparent and attainable plan for funding that identifies the sources of funds, mechanisms for gathering those funds and for allocating them to priority projects, and ensures performance auditing.
- Develop a billing system that includes waste discharge charges.
- Develop and implement incentives for more equitable and efficient water use.

Co-operative governance

- Urgently develop a system of co-operative governance that gives water a high profile across local and regional government structures, and minimizes the circumvention of water policy during economic development.

**Inkomati Catchment Management Strategy
Visioning Exercise
KOMATI RIVER SUB-CATCHMENT
10 March 2010**

Facilitator: Prof Kevin Rogers

The facilitator introduced the customised Adaptive Planning Process and explained how this process would provide the insight on stakeholders' perspectives of a desired future state for the Komati sub-catchment. In so doing stakeholders were providing guidance to the technical team that would draft the catchment management strategy (CMS). This team will comprise ICMA and DWA staff, as well as a range of external experts. The first draft CMS would be circulated to stakeholders and again workshopped with them on 24 March 2010. The plan would then be submitted to the Minister DWA for approval.

This document represents the outcome of the first stakeholder (public participation) meeting for the Crocodile River Sub-catchment of the Inkomati Catchment.

Key issues raised by stakeholders

Water Services Issues: (Not under ICMA mandate)

1. 24hr water supply to communities
2. Water allocation to communities and rainwater harvesting (JoJo tanks)
3. Provision of materials for rainwater harvesting

Integrated Water Resource Management: (Under the ICMA mandate)

4. Need to correctly interface water services issues and water resource management issues especially the integration between Water Services Development Plans and the CMS
5. Decentralise water licensing from DWA Head Office to the ICMA and complete verification and validation of users
6. Sustainability of the resource
7. Communicate the outcome of today's visioning process to communities
8. Building of dams and sinking boreholes
9. Importance of collaboration – using diversity positively
10. Deal with illegal water users
11. What is the current state, and are we happy with it?
12. Assisting emerging farmers to apply for water rights
13. Using water economically/efficiently
14. Inputs for the finance strategy – to sustain the ICMA and realise the vision of water for all in the Inkomati
15. Alien plant invasions
16. Pollution – sewage works, mines, illegal dumping
17. Equity of access to water. Improve water supply for emerging farmers
18. Improve the quality of data
19. How research in SA can help improve these processes

20. Unplanned settlements and the pot pourri of rural development
21. Need a coherent plan for droughts
22. Increase surety of supply by construction of dams on tributaries and interbasin transfers
23. Continued lack of action. When will we stop talking and start doing?!
24. Protection, management, and control of water resource
25. Motivation for international stakeholders to interact about WRM
26. Suitable locations for new dams and repairing of current infrastructure (earth dams and boreholes)
27. Ecological water requirements, quantifying and implementing the Reserve. Linking the Reserve to the International Obligations
28. Writing the CMS!!
29. Implementation of International Obligations
30. Protection of wetlands
31. Formal cooperative governance arrangements between institutions, for dealing with pollution
32. How the CMS links with the Provincial/municipal spatial plans
33. Absence of the mining sector – How do act as a collective to get them on board with this process
34. Concern about water licences being issued via other routes, specifically the Development Facilitation Act (DFA)
35. How are we going to plan for socio-economic growth?
36. People getting a chance to experience the river system in its 'natural state'

Vision

A vision is a concise statement describing the shared desire for the future conditions of the sub-catchment.

The Inkomati CMA has all the powers (delegated functions) it needs in order to share with stakeholders the responsibility for achieving a more equitable, efficient and sustainable future

Values

Our values are the principles we use to evaluate the consequences of actions (or inaction), to propose and chose between alternative options and decisions. The sub-catchment value set reflects the values shared by the stakeholders of the sub-catchment.

- Catchment management is aimed at equity and sustainability, corruption free and cognizant of existing agreements
- Management is flexible, open to critique and outcomes driven, with solutions being practical, achievable and implemented.
- Decision making must be participatory, transparent and consensus based to build trust and compliance amongst stakeholders.
- Decision must be well informed with reliable data to ensure they are credible and legitimate.

- Decisions, actions and outcomes are subject to performance evaluation against measurable goals and timeframes.

Context

The range of social, technical, economic, environmental and political facts, conditions, causes and surroundings that define the circumstances relevant to a problem, provide the “context” within which decisions are made. The context is therefore a fundamental element of any decision making environment. Please refer to the Stakeholder Orientation Document, available on request.

Vital Attributes

The few most important characteristics/properties of the system to be managed are its “vital attributes”. They may be may be technical, ecological, legal, historic, social or economic.

1. The catchment straddles political boundaries (South Africa, Swaziland, Mozambique) creating two distinct river sections each with their own management issues. Overall the catchment is characterised by a water-dependent economy based largely on tourism, irrigation agriculture, forestry and mining.
2. Many important cultural heritage sites, high biodiversity and a scenic landscape mosaic provide a diversity of water-use opportunities
3. The upper catchment is relatively undeveloped and delivers good quality water, some of which is strategically transferred out of the catchment to support the national power generation system. Vast, intact wetland systems are very important in groundwater – surface water interactions
4. The lower reaches of the Komati has a sub-tropical climate with an agricultural potential that exceeds that which the water supply can realise
5. Well regulated water supply: storage facilities; well functioning water resource management institutions; well organised agricultural water allocation system. Irrigation Boards represent diverse agricultural users.

Threats

Threats are factors within, or outside, a partnership that undermine its values and inhibit the pursuit of the vision. Threats are also factors or processes that inhibit ecosystem determinants or vital attributes.

Given the international nature of the Komati river, all of these threats have the potential to be transferred to our international neighbours.

- Uncontrolled mining in the upper catchment is a major threat to water quality and thus national energy production
- Lack of delegation of functions and finances to ICMA and continued lack of enforcement.

- A lack of economic development will lead to an increase in the huge disparities between the haves and the have-nots
- Within 3 years, 90% of the urban centres in the Komati will have insufficient capacity to deal with waste water treatment. A consequence of both poor infrastructure maintenance and limited expansion.
- Lack of cooperative governance (critically, between Department of Water Affairs, Department of Agriculture, Department of Minerals and Energy, Departments of Environment)
- Extensive alien plant invasions. Illegal fishing, hunting, harvesting of plants for medicinal purposes; land use within wetlands and riparian zones; illegal river regulation
- Uncontrolled forestry in the wettest part of the catchment
- Operating rules (agricultural diversions) do not consider ecological processes
- Lack of skilled human resources for water resource management

Objectives

Objectives should be aimed at overcoming threats to ensure the persistence of vital attributes and/or their determinants, under the guidance of the vision statement.

The primary objective must be to achieve full delegation of authority to ICMA so that they can complete compulsory licensing and water allocation reform and develop a time frame for implementation of the CMS. Other critical tasks include;

- Implement a system of incentives, disincentives, and benchmarks e.g. the waste discharge charge system;
- Enforce current legislation with visible policing;
- Develop an effective communication strategy
- Complete metering for the Upper Komati
- Promote conjunctive uses of water, water conservation and water demand management
- Water quality monitoring, auditing the data, and making the data public
- Implement the Reserve
- Quantify climate change effects on water availability
- Develop a formal system for cooperative governance and stakeholder engagement that includes
 - Water services/supply
 - Incorporating the National Freshwater Priority Conservation Areas framework
 - Get mining and tourism on board
 - Participation in international programmes
 - Strengthening stakeholder participation and engagement in decision making

**Inkomati Catchment Management Strategy
Visioning Exercise
SABIE/SAND RIVER SUB-CATCHMENT
12 March 2010**

Facilitator: Prof Kevin Rogers

The facilitator introduced the customised Adaptive Planning Process and explained how this process would provide the insight on stakeholders' perspectives of a desired future state for the Sabie/Sand sub-catchment. In so doing stakeholders were providing guidance to the technical team that would draft the catchment management strategy (CMS). This team will comprise ICMA and DWA staff, as well as a range of external experts. The first draft CMS would be circulated to stakeholders and again workshopped with them on 24 March 2010. The plan would then be submitted to the Minister DWA for approval.

This document represents the outcome of the first stakeholder (public participation) meeting for the Crocodile River Sub-catchment of the Inkomati Catchment.

Vision

A vision is a concise statement describing the shared desire for the future conditions of the sub-catchment.

As Sabie/Sand stakeholders we do not forget that we are sharing this water resource amongst ourselves and with our neighbours. We strive to maintain a decision making environment that enables collaborative action towards sustainability in a continually evolving socio-economic system.

Values

Our values are the principles we use to evaluate the consequences of actions (or inaction), to propose and chose between alternative options and decisions. The sub-catchment value set reflects the values shared by the stakeholders of the sub-catchment.

- Stakeholders share the responsibility for caring for the resource and there is explicit recognition of what each individual/group contributes to promoting equity, efficiency and sustainability.
- We strive for a trusting, transparent and corruption-free system of catchment management that promotes fairness before the law and economic development.
- Decision making is participatory, inclusive and proactive. It is based on the best available local and scientific knowledge to ensure integrity and credibility.
- We appreciate the range and dynamics of cultural and environmental diversity that characterises our catchment

Context

The range of social, technical, economic, environmental and political facts, conditions, causes and surroundings that define the circumstances relevant to a problem, provide the “context” within which decisions are made. The context is therefore a fundamental element of any decision making environment.

Please refer to the Stakeholder Orientation Document , available on request.

Vital Attributes

The few most important characteristics/properties of the system to be managed are its “vital attributes”. They may be may be technical, ecological, legal, historic, social or economic.

- The catchment is a critical element of a prime internationally renowned conservation area International tourist hot-spot Much adventure tourism upstream, which is river and scenic mosaic dependent
- The rivers, riparian zones and other wetlands have a high biodiversity. The Sabie river in the Kruger Park has a particularly high geomorphological and biological diversity. , and thus high tourism potential
- There is a large dependence on the rivers, which still have a relatively good water quality, for livelihoods across all economic sectors (rural poor to very high end tourism ventures).
- Most rainfall is generated in a small area of the upper catchment but demand is primarily in the lower reaches where there are high levels of poverty. Rain is very variable, in both space and time. Dolomite cavities, especially in the Sabie catchment store and steadily release water over the dry period.
- The Sand has some of the highest density rural areas anywhere in South Africa, and the smallest water resource in the Inkomati. Current water allocations are not meeting the domestic and economic needs of many in the catchment
- The first ever government endorsed land use change of forestry to conservation would have improved water yield but is currently being reversed currently
- Rich cultural diversity amongst stakeholders who are generally eager to collaborate in realising their large human potential
- The catchment has a very good research profile/data set
- There is potential for more water storage facilities

Threats

Threats are factors within, or outside, a partnership that undermine its values and inhibit the pursuit of the vision. Threats are also factors or processes that inhibit ecosystem determinants or vital attributes.

- Despite the willingness of some there is still a high degree of public apathy towards water issues. This is probably a function of continued non-provision of water to communities and a lack of commitment to implementing the Reserve

- Corruption (particularly in government), crime (including illegal water abstraction) and continued lack of law enforcement is hampering development
- Climate change, and our uncertain understanding thereof
- Inappropriate land and water use practices and poor planning are leading to uncontrolled population growth and forestry development, invasion by alien plants, degradation of the scenic mosaic and pollution from poorly maintained infrastructure, uncontrolled dumping, sewage systems, farming, industry.
- Continued poor water use practices
- A continued lack of small dams in the lower reaches of the catchment increases the gap between haves and have-nots.
- Continued lack of delegation of functions to ICMA and of delegations down the line

Objectives

Objectives should be aimed at overcoming threats to ensure the persistence of vital attributes and/or their determinants, under the guidance of the vision statement.

The primary objective must be to achieve full delegation of authority to ICMA so that they can develop pragmatic, workable decision-making structures and processes, develop a solid financial strategy, establish Water User Associations, and actively participate in co-operative governance, planning, enforcement/policing, fire prevention and training.

- Mobilise sufficient political will and support to hear the voice of the crying masses for water, and to follow through with the strategy
- A clear plan to engage with service providers about infrastructure maintenance and the polluter pays principle implemented
- Careful quantification of goals for progressive realisation of improved water flow, water quality and the Reserve
- Good and implementable strategy for information collection, and use, in Integrated Water Resources Management, evaluation and monitoring. We need a better quantified water balance

APPENDIX E

**PROJECTS RELATED TO THE WATER
ALLOCATION PLAN**

APPENDIX E: PROJECTS RELATED TO THE WATER ALLOCATION PLAN

<i>Project Name</i>	<i>Project Description</i>	<i>Project Manager</i>	<i>Milestones / KPIs</i>	<i>Project Status (Completed / In proces)</i>	<i>What is the deliverable or end product?</i>	<i>Relevant Sub-strategy in the Guideline</i>
Verification	Assess the legality of the water uses, registered in WARMS in terms of the NWA and previous legislation	DWA	– Verification nearing completion of ELU determinations	Start 1 April 2008. Restarted late 2009. Complete Nov 2010.	Inkomati WMA verified water use	Catchment Description, Assesment & Reconciliation Regulation of water use
Finalising the Principles	Set the principles on which the Water Allocation Framework and Plan will be based. Linked to Project 5	DWA	– Draft principles negotiated with stakeholders – Final principles to be set	Complete	Principles for developing a framework for water Allocation to guide the compulsory Licensing Process	Regulation of water use
Identification of Opportunities	Investigation into surplus yields and unused water allocations in the system (e.g. dilapidated irrigation schemes in former homelands).	DWA	– Fieldwork complete – Report made available	Complete. May need Revision	Report on Identification of opportunities for emerging water users for productive use in the Inkomati WMA	Catchment Description (6.1) Regulation of water use (6.6)
Draft Water Allocation framework	Forerunner to the Water Allocation Plan. Possible compulsory licensing will be based on this framework. Linked to Projects 3 & 6.	DWA	– All precursor projects (1,2,3,4,6,7,9 &10) complete – Draft framework still to go through public participation – Align with CMS Assessment and visioning	In process	A report on the outline of water requirements, principles for allocation and possible curtailment and water allocation scenarios.	Regulating water use.
Water Availability Assessment Study (IWAAS)	Assess the water balances in the system, i.e. weigh up the water availability against the water requirements.	DWA National Planning	– Water balance model available	Complete	Set of final figures indicating water availability. A working yield model for scenario assessment is available	Catchment Description, Assesment and Reconciliation
Classification	On the basis of the new classification system developed by DWAF, classify the water resources in the WMA.	DWA RDM and ICMA	– <input type="checkbox"/> Final WRCS published in the Gov. Gazette · Water resources in Komati, Crocodile and Sabie systems classified	Ongoing	Resources in the WMA classified. Regulations on the classification System.	Water resource protection

Reserve determination	Determination of the ecological requirements and the basic human needs of the water resources in the WMA.	DWA RDM	– Reserves in Komati system determined	In process	Reserves quantified for water resources in WMA. Monitoring Programme has been developed.	Catchment Assessment, Reconciliation and Visioning 6.2 - 6.4) Water resource protection (6.5)
Project Name	Project Description	Project Manager	Milestones / KPIs	Project Status (Completed / In proces)	What is the deliverable or end product?	Relevant Sub-strategy in the Guideline
Operating rules	Develop operating rules for drought and flood situations. Also rules for achieving the optimum utilization of water schemes or river systems including the implementation of the Reserve and International Obligations.	DWA Systems Operations & ICMA	– <input type="checkbox"/> Operating rules established (list of dams and river systems) and being implemented on the Crocodile and Komati.	currently two projects ongoing in the Inkomati.	The end product would be operating rules for the dam or river system.	Regulating Water Use (6.6)
Assesment of Water Use Scenarios	Scenario Modelling Support	DWA Nationla Planning	– Water Use Scenarios for Compulsory Licensing Modelled	Will Follow IWAAS Study	Scenario Options Documented in a report	Reconciliation (6.3)
Water conservation and demand management	Implement measures to minimize water use whilst maintaining the same benefits as before the intervention. Determine Benchmarks for water Use. Determine WCDM Strategies	Water Use Efficiency	– WMA Strategy for the domestic & industrial sector, Irrigation Sector and Mining sector finalized – Benchmarks for water use finalized	Project nearing Completion. End September 08		Reconciliation (6.3) Regulating water use (6.6)
Compliance monitoring and enforcement	Ensure that water users do not use water illegally and that the legal water users adhere to their licence conditions. Take necessary action where transgressions are found.	DWA CME	– Number of sub-policies complete – Consolidated CM&E policy complete – Implementation plan in place		CME Operational Policy and Strategy.	Regulating water use (6.6)
Institutional Realignment (WUA)	Transform irrigation boards into WUAs and establish new WUAs where appropriate.	DWA Regional Office / ICMA	– Number of IBs in the WMA transferred into WUAs – Number of new WUASs established	Await confirmation		Integration strategy (6.10)
Dam development potential	Water resource development scoping study in the Crocodile River	Johan Geringer	– Identify dam sites	Study now being wrapped up	Most promising dam sites identified	
All Town Study	Broad Water Reconciliation for all Municipalities	Niel van Wyk	– First Order Strategies for water Availability	PSP Being asked for Proposals	Water reconciliation options available to municipalities	Reconciliation (6.3)

PRIMA Projects	Refer to Appendix C		-			
Project Name	Project Description	Project Manager	Milestones / KPIs	Project Status (Completed / In proces)	What is the deliverable or end product?	Relevant Sub-strategy in the Guideline
Waste Discharge Charge System	Implement the polluter pays principle.. The project includes the registration of waste related water use, enhancing IT systems to cater for the WDCCS and eventually to finalise the methodology after having tested this in three pilot catchments.	DWA	<ul style="list-style-type: none"> - Piloting in Upper Vaal, Upper Olifants and Croc/Marico - Methodology for determining RQOs. - ICMA to campaign for pilot in Inkomati WMS 	Registration of WD related water use in progress	All WD related water use registered on WARMS Lessons learnt recorded from pilot projects and methodology amended accordingly WDCCS implemented in all other catchments	Regulation of water use (6.6) Funding IWRM (6.9)
Call for Licenses	Part of compulsory licensing. Follows after water allocation framework is complete. Call will be made in Catchments Identified as requiring Compulsory Licensing through the Framework and CMS Projects	Johann van Aswegen	<ul style="list-style-type: none"> - HRs in place in the RO and ICMA offices - HRs trained - Compulsory licensing called for in the Gov Gazette 	Not started.	A Government notice instructing all water users in the catchment to apply for a licence.	Regulating water use (6.6)
Issuing of Licenses	Processing the licence applications following the call for licences.	Johann van Aswegen	<ul style="list-style-type: none"> - Number of applications received - Number of licences issued 	Not started. Linked to project 20 above.	Not started	Regulation of water use (6.6)
Ecological Water Requirement policy for the Komati River Basin	A basin wide (RSA & Swaziland) ecological water requirement study to develop an ecological water requirement policy and a management plan to implement the policy in the Komati River Basin.	(KOBWA	<ul style="list-style-type: none"> - Collection of ecological and socio-economic baseline data and scenarios - Development of an ecological water requirement policy, 	To begin in August 2008	An basin wide ecological water requirement policy for the Komati River Basin between Swaziland and South Africa and a management plan to implement the policy	Implemented by KOBWA
Future developmen studies on the Komati River Basin - phase 1	A study to optimise the Management of the water resources of the Komati River Basin upstream of Komatiport in Swaziland and South Africa.	KOBWA	<ul style="list-style-type: none"> - Evaluation of: - Demand management measures, - System Operation, - Operating Rules, - (Strategy to implement above) 	To start in July 2008	System optimization	KOBWA Project

APPENDIX F

THE LEARNING STRATEGY

APPENDIX F: THE LEARNING STRATEGY

ACKNOWLEDGEMENTS

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- **INTRODUCTION**

INTRODUCTION

The ultimate purpose of this document is to guide initiatives towards formal mainstreaming of the kind of learning culture necessary to deal with the challenges faced by the Inkomati Catchment Management Agency. The document suggests a series of actions and concepts to consider that encourage staff to debate the meaning of what organisational learning means in their context. The intention is that this ongoing process will institutionalise learning in a way that will improve effectiveness and efficiency of management of our precious water resources.

The structure of the document is largely based on the process of adaptive management.

The contents of this document are a consolidation and refinement of the strategy and underlying learning philosophy presented in the WRC report Roux et al., (2009a).

LEARNING ORGANISATIONS

This section is based on Roux et al. (2008).
See also Chapter 2 in Roux et al., (2009a) for more detail on the nature of learning organisations.

When change, uncertainty and surprise are common features of everyday life, our capacity to learn takes on special meaning and urgency. One needs to reflect on and extract lessons from past experiences, unlearn outdated habits, consider options for the most appropriate future direction, anticipate change, and strategically acquire new knowledge - all at the same time.

The degree to which organisational learning takes place is determined by the quantity, quality, focus and coherence of learning that is practiced by its members. It would thus make sense for organisations to have strategies in place to understand the learning process in relation to their mandate and strategic objectives. It should also deliberately

advance those conditions that enable good learning practices. However, such enabling conditions may vary widely and may be deeply contextual.

A learning organisation is one that is particularly skilled at acquiring knowledge (from external sources), creating knowledge (internally), and sharing knowledge (internally and externally), and, most importantly, at modifying its behaviour to reflect such new knowledge and insights. It is the availability of special human skills and attitudes that will ultimately determine the quality of the learning journey and the effectiveness of responses to external forces.

REALITY CHECK

Reacting to external forces first requires acknowledging their existence. The natural resource management environment is very demanding for many reasons:

The rate of knowledge production world-wide is ever-increasing. Many knowledge workers suffer from information overload. Knowledge mobility, both electronically and through people relocating, is increasingly easy. There is also acknowledgement of the increasing interdependence of those with knowledge and those who need to apply it (e.g. between scientists and policy makers).

Managing natural resources is about managing social-ecological systems, i.e. linked systems of people and nature. They are complex systems, inherently unpredictable on many levels. The strategic importance of common property resources, like water, also remains undervalued by many.

There are also learning-related realities, each with its own implicit challenges. Learning is context specific. We interpret new information based on theory and past individual experiences. We can learn faster if we have access to willing mentors of superior experience. Learning proficiency is better when it is about something we already know something about.

THE STRATEGY IN CONTEXT

The learning strategy framework below aims to make organisational learning specific to each organisation. The strategy itself is generic although specific organisations may have slight variations.

The actions in the strategy call for staff to reflect on, and debate, what learning and knowledge management means to them now and what it should mean in future. Importantly, it requires consideration of both the personal and organisational relevance. A variety of associated concepts are proposed for discussion.

The outputs of this reflection and debate are entirely organisation-specific, i.e. deeply contextual. These outputs include the learning-related vision, the chosen operating principles, the understanding of the social-ecological system, the learning-related management objectives and associated goals, the management plan, and the way of learning will be monitored, reflected upon and adapted to. It is not likely that two different natural resource management organisations will produce the same outputs.

ADAPTIVE MANAGEMENT

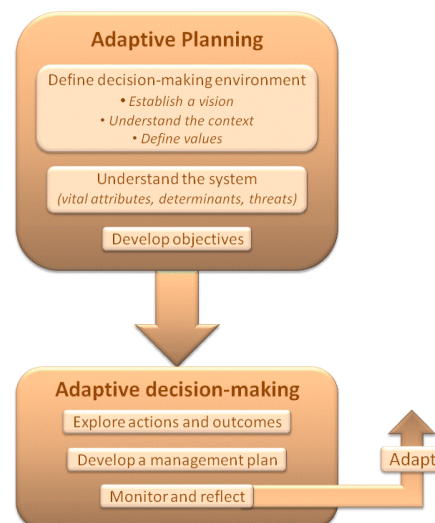
Adaptive management is an intuitively sensible framework for learning. By its very nature it is about learning by doing in a scientific way to deal with uncertainty. It is a structured iterative process of decision making which treats human interventions in natural ecosystems as experimental probes.

Adaptive management is forward-looking, explicit in its purpose, inclusive, based on co-learning, pragmatic, action oriented, flexible, and continually improving.

Management planning involves consciously predicting and documenting the likely outcome of decisions while acknowledging the uncertainties. The management plan itself is a set of actions, with targets, that follow up on that planning.

Reflection on the monitoring results is done against the targets and predicted outcomes. Future plans, objectives or understanding are adapted accordingly.

Should there be a formal organisational adaptive management process in progress the actions proposed here should take place in an integrated way with that main process.



• THE LEARNING STRATEGY - ADAPTIVE PLANNING

DEFINE DECISION MAKING ENVIRONMENT

ESTABLISH A VISION

Action: Engage with staff and selected stakeholders to establish a vision and high-level objective relating to learning and knowledge that will clearly support the organisation’s overall vision. This process will aim primarily to establish a common future focus and buy-in in respect of learning and knowledge management.

Concepts to consider: A prototype vision upon which to base the process will be the following:

The Inkomati catchment management agency (ICMA) commits itself to “Learning for work excellence” in striving for its vision of “Water for all in the Inkomati”. It also acknowledges that the very nature of learning is such that it pervades every aspect of water resource management in the Inkomati water management area.

The ICMA specifically commits itself to becoming a highly-effective learning organisation, with a particular emphasis on co-learning. This entails becoming very successful at the following:

- Acquiring knowledge from (*i.e.* learning from) external sources.

- Creating knowledge internally by effective processing of acquired knowledge.
- Transferring knowledge amongst staff members, to stakeholders in the water management area, and to other interested parties.
- Adapting when necessary, based on the insights of sound new knowledge, to remain focussed on its learning vision and associated objectives.

UNDERSTAND THE CONTEXT

Action: Discuss and understand the context within which learning will take place with the ICMA Board, all staff members and selected external stakeholders.

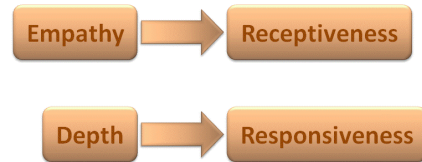
Concept to consider: The discussion will include refinement and ultimate consensus on the underlying knowledge- and learning-related assumptions representing the global, national, and regional realities of water resource management. The discussion should be guided by issues that are **S**ocial, **T**echnological, **E**conomic, **E**nvironmental, and **P**olitical. The following are some examples:

- **There is one learning system.** In this system, all knowledge (e.g. scientific, local, traditional, practical, political, etc.) is acknowledged. Each is produced, validated and legitimised through different processes. The ICMA acknowledges that a deep understanding of, and genuine participation in the broader learning system is critical.
- **Social-ecological systems exhibit complexity.** The ICMA acknowledges the relevance of complex systems in their water management area and within the ICMA itself. In effect, this acknowledges that a degree of bottom-up self-organisation will play a significant role in the functioning of the system for which the ICMA is responsible. Importantly, the ICMA also acknowledges that unpredictability goes hand-in-hand with complexity. Both self-organisation and unpredictability have profound implications for the ICMA's management approach.
- **External knowledge-related realities.** Globally there is ever-increasing potential for data and information overload and an increasing rate of knowledge production, availability and mobility. These all increase the interdependence between those with knowledge and those without it (the "haves and the have nots"). South Africa is also faced with limited resources for scientific development.
- **External knowledge-related uncertainties.** A variety of uncertainties exist relating to the future political situation, future tertiary graduate quality, attitudes towards the environment, and the implementability of the Water Act.
- **Internal knowledge-related realities.** Being the first CMA to be established, there are no other local water resource management models from which to learn directly. Dependence on DWAF remains high and difficulties are being experienced attracting highly qualified staff to the ICMA. A number of operational systems are also not yet fully functional.
- **Internal knowledge-related uncertainties.** Uncertainties exist relating to the exact model under which CMAs will function, the capacity of the ICMA to discharge its mandate, and who might emerge as the ICMA's future learning partners.

DEFINE VALUES

Action: Identify, discuss and adopt the values (or operating principles) that will guide learning-related management.

Concepts to consider: An efficient and effective organisation responsible for natural resource management must be both acutely receptive and convincingly responsive. This is achieved by being empathetic on the one hand and having knowledge depth on the other.



ENABLING IDEALS

See Chapter 3 in Roux et al., (2009a) for more detail on a philosophy of learning.

Receptiveness and responsiveness are ultimately underpinned by the following fundamentally enabling learning ideals:

- **"Common future focus"** strives to ensure that all stakeholders have agreed to a well-defined vision of the future and that this actively determines what is learned.
- **"Social knowledge sharing"** strives to facilitate freely interactive sharing, inquiry, debate and negotiation of new information between learners and those with the knowledge that should be shared.
- **"Empathy"** strives to stimulate co-creation of new knowledge by nurturing a culture in learners to interact and share with other knowledge systems (cultural, political, scientific, etc.) and knowledge levels (novice, expert) with understanding and an ethic of mutual respect for knowledge (in all its forms), wisdom, culture, language, abilities, concerns and inputs of all stakeholders.
- **"Learning by doing"** strives to ensure that knowledge is also created through hands-on practical experience.
- **"Prior knowledge engagement"** strives to ensure that knowledge creation acknowledges, monitors, adapts to, and builds on what learners already know.
- **"Patience"** strives to ensure that adequate time is allowed for absorbing appropriate knowledge and that the expectations during the learning process, of all concerned, are realistic.
- **"Experimentation"** strives to completely embrace (allow, plan for, and learn from) provisional or exploratory initiatives that are not necessarily guaranteed to succeed or produce short-term desirable results.
- **"Positive persistence"** strives to ensure that learners have determined yet positive and enthusiastic attitudes to acquiring new knowledge.
- **"Transdisciplinarity"** strives to ensure that the knowledge that is created (in individuals and in organisations) is appropriate and adequate at each level in a hierarchy of disciplines (*e.g.* from technical through political to ethical) and, where necessary, adequately detailed (*i.e.* based on deep understanding).
- **"Adaptability"** strives to ensure that individuals learn to manage their own resilience, that is, their capacity to react constructively to disturbance and to change when necessary.
- **"Synergism"** strives to ensure that teams are able to apply routine strategies that result in achievements greater than that attainable by the individuals operating separately ("the whole is greater than the sum of its parts").

Social-ecological systems, as well as organisations, are complex systems. Complex does not mean complicated. An engine is complicated. It is also predictable, at least by those

who put it together. A complex system has particular properties that make it *inherently* unpredictable. Being able to recognise a system as complex allows one to better understand that system at least to the extent that one understands why, in a general sense it is the way it is.

It is the unpredictability of such systems that has fundamental implications for their management.

See Chapter 4 in Roux et al., (2009b) for more detail on complex systems.

The following ideals acknowledge complexity and should also underpin adaptive management.

- **“Sensitive persuasion”** acknowledges that self-organising natural and human systems are of such a nature that they cannot function optimally within formal “command and control” management approaches.
- **“Up close and personal”** acknowledges that the nature and extent of interpersonal relationships are core drivers of dominant social behaviours and so strives to make such relationships the focus of learning-related management actions.
- **“Expecting the unexpected”** strives to create and maintain an ever-present mindset of expecting to be surprised.

THE RIGHT PEOPLE

Consider the following to attract and retain the best minds:

- **Exploit potential environmental attractiveness.** The best professionals tend to have options and will choose a workplace based on perceived attractiveness. Geographic location and physical appearance contribute to such perceptions. For example, the Inkomati CMA has offices in Nelspruit. Marketable factors associated with a move to the “Slowveld” include a higher quality of life and an escape from the rat race.
- **Seek and acquire exceptional skills.** Remember that bright minds attract bright minds. Technical professionals love to work with and learn from acknowledged leaders in their field. A recognised and respected expert that is appointed will serve as a source of organisational credibility and a magnet to new talent. The opposite is also true: The loss of a highly valued employee may result in other employees questioning whether they should stay.
- **Retain critical expertise in feeder pool.** Don’t lose critical expertise from the DWA Regional Office (currently the primary feeder organisation). Remove some of the uncertainty regarding their potential roles in the CMA through frequent communication.
- **Create enabling support systems.** Knowledge professionals should be able to focus on their primary responsibilities and not be constrained by system shortcomings and distracted by unnecessary administrative duties.
- **Nurture a network of strategic relationships.** Don’t try to own all the knowledge needed for executing your mandate. Rather create and nurture a strategic knowledge network. Nodes in the network should include stakeholders, academics, consultants and previous employees with valuable contextual knowledge.

NURTURE ALL

Consider the following:

- **Experiment with opportunities.** Explore explicitly how to make the most of each person in the organisation. Provide opportunities for all to flourish.
- **Be receptive and responsive.** Acknowledge the existence of people who may have unaligned agendas. Don't underestimate the damage they can do. Look out for signs of emerging unacceptable behaviour. Respond sensitively and with empathy when unacceptable behaviour does emerge. Get to the core of the causes and address them.
- **Establish learning standards up front.** Sensitise new staff to the learning standards expected of them (e.g. common future focus, social knowledge sharing, and empathy).

THE RIGHT ENVIRONMENT

Consider the issues presented in the following boxes:

The right environment: Build knowledge depth and breadth

To become a Jack of all trades you must first be Master of at least one.

The concept of a catchment management agency is new to South Africa. Early investment in acquiring the breadth and depth of knowledge required to adequately discharge its mandate is of utmost importance. The start-up phase presents a once-off opportunity to start with a clean slate. The type and level of skills that the CMA will acquire through recruitment and appointment will determine its ability to deliver on its mandate.

- **Cover all bases**
 - **Have some in-house capacity in all necessary disciplines:** The following disciplines are critical: Aquatic ecology (at least two specialisations from botany, ichthyology and entomology), botany, water quality (including chemistry, microbiology and toxicology), hydrology, geohydrology, geomorphology, GIS, water resource planning and operations, administrative, legal and financial management support, stakeholder engagement (including the functions of ecosystem governance and strategic adaptive management) and communications. A combination of social facilitation skills and technical background is required.
 - **Leverage external knowledge through internal depth:** The CMA needs a certain minimum, "critical mass" of in-house depth of relevant knowledge to be able to identify, absorb and exploit knowledge that exists outside the CMA.
 - **Perform a formal capacity needs analysis.**
- **Cover core bases in depth**
 - **Appoint some recognised experts:** Significant depth of understanding and experience is required in the critical disciplines, namely, aquatic ecology, water

quality (including chemistry, microbiology and toxicology), hydrology and geohydrology, water resource planning, management, and stakeholder engagement.

- **Fill gaps in depth from external network**
 - **Develop strategic relationships:** Knowledge flows across organisational boundaries are enabled by inter-personal relationships and networking which require time to establish.
- **Balance experts and novices:** Appoint staff to reflect a balance between seasoned professionals and novices to facilitate mentoring and succession. Attract experts first. Quality experts will tend to attract quality novices.
- **Find some integrators:** Ensure there are some individuals with depth of knowledge and breadth of experience who also have the skills for integrating across disciplines and knowledge forms. Create a post called, for example, “project integration manager” with a job description that is explicitly cross-cutting and multi-disciplinary.

The right environment: Learn and unlearn

Old dogs must learn new tricks

The complex nature of organisations and social-ecological systems and the unprecedented nature of CMAs will inevitably require new learning. Although each individual in a CMA will have a history, the CMA has no collective organisational history or memory specific to its identity. The ex-DWAF staff will bring a collective DWAF history to the CMA. However, the unique nature of CMAs will necessitate continual learning of new concepts and require suppressing and discarding outdated habits.

- **Learn continuously:** The intellectual capital within the organisation should be nurtured and grown continuously:
 - **Build both individual and group skills.** See Box: Facilitate individual and group learning.
 - **Provide learning opportunities:** Support attendance of, and especially participation in, relevant conferences, workshops, symposia and training courses. Promote ongoing formal education and actively encourage exposure to fieldwork.
 - **Build confidence:** Use mentors and allow for making mistakes. Allow especially for reflective learning from mistakes.
- **Capture learning in explicit form:** Tacit and implicit knowledge needs to be made explicit (e.g. by writing a report) so that it can be shared, stored as part of the organisational memory, and be available for future reference. Capturing learning in this way should be firmly institutionalised.
- **Know when to unlearn:** Encourage the self-confidence and humility required for exposure to new ideas and mental models.

- **Value mavericks:** Use them to test prevailing paradigms.
- **Use double- and triple-loop thinking:** This will quickly expose when unlearning is necessary. See Box: Apply single-, double- and triple-loop learning.
- **Reinforce newly adopted ideas:** Ensure there is sufficient reinforcement of new concepts to discourage falling back on old inappropriate habits.
- **Give it time:** Create enough reflective time and appropriate physical space to enable disconnection from old mental models (like in a sabbatical or retreat).
- **Know how to unlearn:**
 - **Manage with sensitivity:** Unlearning requires people to move out of comfort zones. Imposed unlearning can therefore have emotional costs.
 - **Do succession planning:** Minimise the adverse effects of unlearning occurring through unplanned, and in some cases, even planned staff losses. Design innovative strategies to retain good staff.
 - **Nurture relationships:** Implement sensitive exit strategies with staff leaving the organisation. Create opportunities to subsequently engage with them to retain their critical knowledge within the learning network by focussing on the special interests (especially “deeply embedded life interests”).

The right environment: Respond rapidly but reflect patiently

*"Quality of life depends on what happens in the space between stimulus and response."
(Covey et al., 1994)*

A CMA environment is complex and surprise is inevitable. A stark reality is the need to respond efficiently and effectively to new situations as they arise. While some “fire fighting” is almost inevitable, there is also a critical need for ensuring that this does not occur at the cost of careful and reflective thought.

- **Build a supportive network**
 - **Build knowledge breadth and especially depth:** Experience (which creates knowledge depth) will often be essential to effective response. However, both breadth and depth are important.
 - **Nurture allies:** Create strategic alliances with organisations such as NGOs, universities, parastatals and government departments. Know the capabilities of individuals and develop deep relationships with them, sufficient to be comfortable calling them in an emergency and to involve them seamlessly in projects of interest to both parties.
 - **Rely on experience:** Look to the experienced people in your organisation and in the wider learning network for guidance. But don't abuse them.
 - **Take turns.** Consider taking turns to fight the fires.
- **Cultivate a reflective learning capacity**
 - **Nurture role models:** Support, empower and learn from role models that may emerge who are able to practice reflective learning amidst the chaos.

- **Make the time:** Use occasional undisturbed retreats that deliberately create space for both general learning and reflective learning (e.g. capturing lessons learnt, double- and triple-loop thinking). These can improve the way things are done in future. See Box: Apply single-, double- and triple-loop learning.

The right environment: Facilitate individual and group learning

"Interdependence is and ought to be as much the ideal of man as self-sufficiency. Man is a social being"
(Gandhi)

Learning, in essence, takes place at the level of an individual. However, most learning takes place in and is influenced by a social context (*i.e.* it is socially mediated). The CMA staff learning and broader extended learning network must grow in both size and quality. In particular, opportunities for learning in diverse social contexts should increase. Each individual, and the organisation as a whole, must find the right balance between the degree of individual learning and social learning.

- **Acknowledge that both are important.**
- **Explicitly facilitate individual learning.**
 - **Create the space:** Make physical space available and allow the time. Ensure the impression is created that learning takes place “on duty” and “off duty”.
 - **Cater for individual preferences:** Allow for preferred modes of learning (for example, see Box: Use theory and practice).
- **Manage group learning.**
 - **Create the space:** Use anything from the tea room to stakeholder meetings.
 - Encourage the sharing of mental models.
 - Promote the use of role models, secondments and apprenticeships.
 - Support participation by allowing attendance at relevant events.
 - Acknowledge that effective group learning takes time.
 - **Employ team players.**
 - **Employ connectors:** Find people who have networks and who can create them.
 - **Facilitate connectedness:** Use appropriate technology to connect, like cell phones, and email. Make adequate provision for subsistence and travel costs.
 - **Know the brain profiles:** Use this knowledge to encourage self-awareness and knowledge of the personalities and styles of others to optimise group learning.
 - **Nurture effective communities of practice:** Support and influence (but don't command and control) their identity, engagement, alignment, and impact. Nurture good inter-personal relationships that emerge.
 - **Engage, don't try to own:** Don't try to acquire all knowledge. Engage your knowledge with the network. Learn how to effectively participate in broader learning systems – to be one part of a larger process where the benefit is mutual.

- **Sensitively expose and rectify:** Use group learning opportunities to sensitively expose and rectify incorrect knowledge (factual or interpretive) that may be held by an individual or sub-group.
- **Learn with empathy:** To fully understand and appreciate the contexts of your learning partners it may be necessary to spend time with key learning partners, e.g. through a temporary secondment to an irrigation board.
- **Don't leave others behind:** Beware of fragmented "ivory tower" learning when the link between an individual's or group's mental model and the shared mental model is broken or weakened. This can result in isolation. On the other hand, in some instances it may be beneficial for the organisation to allow a group to make optimal use of a specific learning opportunity (e.g. a new technology) without waiting for the rest of the organisation. However, at some point care should be taken to actively share such small-group mental models to expand the base of organisational shared meaning.

The right environment: Use theory and practice

"There is nothing as practical as a good theory."

Most problems require a combination of both theory and practice in order to be tackled effectively. Optimal learning also requires data, information, experience (often deepened through learning by doing) and theory (that provides the context for interpreting the information and experience). A balanced portfolio of theorists and those who are more practically inclined, and an environment that gets them communicating, can be a powerful basis for highly constructive synergism.

- **Learn by doing:** Create opportunities for staff members to do things themselves.
 - **Get feet wet:** Physically seeing, smelling, and feeling your water resources can provide deep everlasting perceptions and perspectives.
 - **DIY:** Let junior staff do things themselves, like write reports or engage with stakeholders. This creates confidence and builds experience.
- **Embrace theory:** Don't shy away from it.
 - **Understand the role of theory:** Theories and good models (especially simple conceptual models) help put data, information, observations, etc. in a broader context.
 - **Tackle tough concepts:** Understand the basics of theories such as complexity, resilience, systems thinking, etc. They create perspectives that will not only help you understand the world around you, but also help you cope with its demands.
 - **Combine theory and practice through own research:** Constantly formulate research questions to facilitate systematic probing, investigation, sense-making and learning.
- **Acknowledge deeply embedded life interests:**

- **Know your colleagues:** Bosses should know their staff better than they know themselves. Know what they are passionate about (e.g. are they natural theorists or natural field practitioners?).
- **Align tasks accordingly:** Align job descriptions with these interests. Don't simply use job description templates.
- **Optimise your people portfolio:**
 - **Acknowledge a range:** Some naturally theorise while the field-work junky samples and analyses everything in sight. Be tolerant of both.
 - **Get the right balance:** The "right" balance for your organisation will emerge over time and will be dynamic.
 - **Viva la difference:** Encourage diversity in the approaches of people. However, always nurture an effective social knowledge sharing environment.

The right environment: Build on prior knowledge but also experiment

"The group [of monkeys] moves more, is more exploratory, is more playful than there is any need for on an average day, but by so doing it is preparing for crises. The individual animals appear stronger and more intelligent than is necessary for normal activity, but survival requires coping with the rare event"
(Washburn and Hamburg, 1965).

Related prior knowledge is necessary to respond effectively to a new challenge. Therefore, the collective prior knowledge of the CMA's staff will determine how effectively the CMA can respond to everyday responsibilities and challenges. Indeed, it will also determine which challenges the CMA cannot respond to. Appropriate prior knowledge also enables the CMA to follow due process and accept accountability knowing that due process was followed to the best of their ability. The early growth phase of a CMA also offers a unique degree of freedom to explore options before standardising procedures.

Structured experimentation presents a mechanism for systematically exploring and choosing future options. In addition, when there is only limited understanding of a problem (*i.e.* when a theory is not available) experimental learning is the only way forward. Because the CMA operates in a complex system, the Water Act, associated policies and strategies, as well water use license conditions should not be viewed as "cast in stone". Rather, the social and ecological feedbacks from implementing these mechanisms should be monitored and studied to facilitate adaptive improvement over time.

- **Acknowledge prior knowledge as a strength.**
 - **Align knowledge and responsibility:** Ensure alignment between the prior knowledge (based on previous experience and training) and the functional responsibility of individuals. Equivalently, don't put the wrong people in the post.
- **Periodically test the relevance of prior knowledge.** (See also Box: Learn and unlearn.)

- **Allow experimentation:** Create some space for deliberate experimentation beyond immediately relevant boundaries of current needs and abilities. As active experimentation becomes an integral part of the culture, experimental learning will naturally help to modify beliefs and mental models that reside in the organisation.
- **Encourage social knowledge sharing:** Networking and active knowledge sharing (on an equal power base) within the extended learning network will help to prevent the organisation becoming self-referential. See also Box: Facilitate individual and group learning.
- **Learn with humility:** Learners need to be sufficiently self-confident and have sufficient humility to be open to alternative mental models when learning with stakeholders and colleagues.

The right environment: Apply single-, double- and triple-loop learning

"An unreflective fastness always returns you to the same place"
(Cilliers, 2006)

When you have created time for reflection, what kind of thinking can we use to help us reflect in a structured and meaningful way? One useful framework involves thinking at various, and ever-deepening, levels varying from single- through to triple-loop thinking. Each has its place. Each has its time. However, each also has its ramifications.

- **Continually improve:** It is important that agreed procedures are implemented correctly. Apply single-loop learning (in effect, quality control) to ensure you not only maintain high standards but improve on them when necessary. This is critical for a CMA environment in which 'due process' is an essential, if not legal, requirement.
- **Get to core:** Reflect on core assumptions (double-loop thinking) and even underlying values (triple-loop thinking) that underpinned an action or strategy (either successful or otherwise).
 - **Prepare for and respond to unpredictability:** Apply double- and triple-loop thinking more frequently in systems that are unpredictable, particularly when you have perhaps been caught off guard. Why did it happen? What should be done in future?
 - **Encourage open non-threatening debate:** Negotiate meaning and compare and analyse mental models to get to grips with underlying assumptions and governing values. Both double- and triple-loop thinking are useful when developing a common vision in a multi-stakeholder environment. The core assumptions and values of stakeholders can be identified and hence be better understood by others.
 - **Prioritise relevance:** Double- and triple-loop thinking help prioritise the relevance of incoming knowledge (and hence manage information overload more effectively).
- **Apply adaptive management.**

- **Do things better next time:** Understand that single-, double- and triple-loop thinking and learning are the critical stages that result in doing things differently in future, *i.e.* adapting.
- **Have well-defined thresholds of potential concern (TPCs):** Associate the TPCs with real actions (like “Have a management meeting to decide on how to respond. Document the decisions. Monitor follow-up actions and their effects.”).
- **Share the learning.**
 - **Capture the lessons:** Make time to capture new experiential learning. (See Box: Respond rapidly but reflect patiently.)
 - **Avoid fragmentation:** Share the learning widely to avoid mental models becoming fragmented from the organisation and hence preventing the organisation from benefiting. (See Box: **Error! Reference source not found..**)

UNDERSTAND THE SYSTEM

Action: Probe in greater depth the general nature of the organisation itself and its social-ecological system. A critical input to this process is the current understanding of the status quo in the area, including all issues relating to resource use and protection. The purpose is to identify vital attributes, determinants, and values which are core factors in the way the systems (social, ecological, economic, etc.) in the area function.

Once identified, examine these in depth and identify the factors that strengthen or weaken the vital attributes.

DEVELOP OBJECTIVES

Action: Develop learning-related objectives that are agreed to by all. Break down into achievable management goals.

Concepts to consider: Given the nature of learning and knowledge, acknowledge the need for a nurturing management style rather than one that applies a quantitative “tick-box” mentality to monitoring progress and assessing staff performance. Accordingly, do not overemphasise quantifiable learning targets. Emphasis should be on job satisfaction and qualitative assessments of the value of learning-related achievements.

Relate objectives and goals to the above-mentioned contexts of the right people and the right environment and based them on the shared understanding developed within the organisation of the above learning ideals.

• THE LEARNING STRATEGY - ADAPTIVE DECISION MAKING

EXPLORE ACTIONS AND OUTCOMES

Action: Explore a variety of learning-related actions and explicitly consider likely outcomes in each case.

Concepts to consider: This brainstorming prepares the organisation for making decisions and helps weigh up options.

- **Identify potential advantages.** Identify the main reasons for adopting each action.
- **Consider the practical implications.** How will the action be executed in practice? Is the manpower and competence available?
- **Identify potential pitfalls.** Identify explicitly what might go wrong or what might impede implementation of the action.

DEVELOP A MANAGEMENT PLAN

Action: Identify, discuss and adopt the values (or operating principles) that will guide learning-related management.

Concepts to consider: Specific actions can include:

- **Establish data management facilities.** Information management relies on a sound data management system. Put in place appropriate systems for data acquisition, storage, and retrieval.
- **Establish information management facilities.** Knowledge management relies on a sound information management system. Examine information requirements of staff members. If appropriate, establish a library of relevant publications. Both data and information management facilities address the organisation's vision of an effective learning organisation being able to acquire knowledge effectively.
- **Identify group learning facilities.** Give specific attention to allocating pleasing and practical locations for groups to come together, either at a moment's notice or with more foresight, possibly at more remote locations for more in-depth interactions and social knowledge sharing.
- **Identify opportunities for group learning and "learning by doing".** Identify opportunities for staff to work and learn together in an integrated manner on real natural resource management projects.
- **Capture reflective learning.** Devise a system that facilitates learning-based deep reflection on successes and failures. Consider how the outputs of such sessions will be captured and how the learning will subsequently be made available. This issue directly addresses the organisation's vision of an effective learning organisation being able to create and transfer new knowledge.
- **Develop a poster of learning ideals.** Develop a poster (or series of posters) that capture the basic learning ideals in a simple, pleasing and communicative manner that is relevant to the water management area. Displayed in the organisation building especially including locations frequented by visitors and external stakeholders.
- **Predict and document the expected outcomes.** For each of the above specific actions, the consequences for learning and knowledge management will be predicted and documented.

IMPLEMENT THE PLAN

Action: Implement the plan in a spirit of receptiveness, sensitivity, responsiveness and a willingness to adapt.

Concepts to consider:

- The learning journey is about constant vigilance.
- Employ an external learning specialist to facilitate your process and add to the richness of your journey.
- Nurture tacit knowledge. Store explicit knowledge.
- Be a gardener sensitive to the environment and feedbacks from the garden. Facilitate richer growth.

MONITOR, REFLECT AND ADAPT

Action: Every two years (or more frequently) reflect on the degree to which the installed learning-related systems have achieved the documented objectives and outcomes. Between such formal overall reviews, more frequent monitoring of sub-processes will also take place.

Concepts to consider: Ask staff members to qualitatively assess the effectiveness of the systems in an open and honest manner. Consider a reward system, at least entailing recognition within the organisation, for outstanding contributions to learning and facilitating an organisational learning culture. If learning-related systems are not up to expectations, ensure there are specific management decisions to refine or replace the systems.

- The attainment of specific high-level and low-level objectives.
- The effectiveness of recruiting appropriate staff.
- Progress in updating and maintaining data and information processes.
- Effectiveness of group learning and “learning by doing” projects.

• EXPLANATION OF TERMS

Community of practice

A community of practice is a group that emerges naturally, organising itself. They share a passion and meet regularly and informally to learn and practice how to do things better. Identity is defined by the task (e.g. fishing or photography) and the specific area of knowledge (e.g. yellowfish or underwater photography). The community typically develops relationships that enable very effective knowledge sharing and problem solving. It is not merely a community of interest – they actually practice something and accumulate considerable practical knowledge (i.e. depth) over time. One of the primary implications for management is that such self-organising communities don't take kindly to command and control. They need nurturing and sensitive persuasion.

Complex systems

Social-ecological systems, as well as organisations, are complex systems. Complex does not mean complicated. An engine is complicated. It is also predictable, at least by those who put it together. A complex system has particular properties that make it *inherently* unpredictable. Being able to recognise a system as complex allows one to better understand that system at least to the extent that one understands why, in a general sense it is the way it is. It is the unpredictability of such systems that has fundamental implications for their management.

See Chapter 4 in Roux et al., (2009b) for more detail on complex systems.

Deeply embedded life interests

Deeply embedded life interests are subjects or activities about which people are profoundly passionate and that make them happy. Examples include application of technology, quantitative analysis, theory development and conceptual thinking, creative production, counselling and mentoring, managing people and relationships, enterprise control, and influence through language and ideas (Butler and Waldroop, 1999).

Knowledge

Knowledge is that which is known, or knowable by a person that can contribute to their capacity to act effectively (partly based on Dawson 2000). It can be explicit or tacit. It can be information that has been deeply contextualised using theory or experience (or both). An example is a water quality measurement (the datum) that has been assessed against a water quality guideline where (a) the theory of origin of the guideline is well understood or (b) there is long experience of the historical trend of this variable and its management. In either case, this extra contextualization can significantly contribute to a greater capacity to act effectively in the management of that variable.

Knowledge depth

Knowledge depth refers to the acute factual and contextual understanding of the subject to the extent that tacit knowledge becomes an integral part of communicating that understanding.

Knowledge, explicit

Explicit knowledge is information in explicit form (e.g. stored in written form, equations, in databases, specifications, guidelines, etc.).

Knowledge, tacit

Tacit knowledge is knowledge that exists only in a person's head. It is often highly personal, context specific and difficult to make explicit and share (Nonaka et al., 2001).

Learning

Learning is the creation of knowledge.

Learning organisation

A learning organisation is one skilled at (a) creating, (b) acquiring and (c) transferring knowledge, and (d) at modifying its behaviour to reflect new knowledge and insights (Garvin, 1993).

Organisational memory

Organisational memory refers to how organisations encode, store, and retrieve the lessons of history despite the turnover of personnel and the passage of time (Levitt and March 1988). It provides a means to retain and transmit information from past to future members (Stein 1995).

Reflection

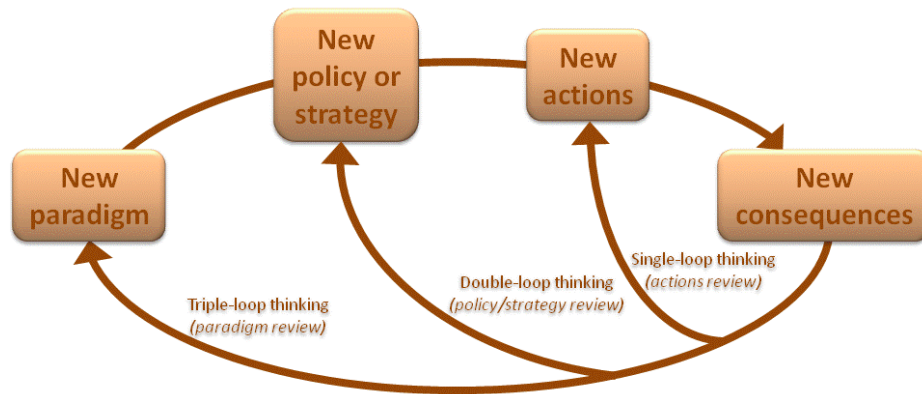
Reflection is the practice of stepping back to ponder the meaning to self and to others in one’s immediate environment about what has recently transpired (Raelin, 2001).

Self-referential

Self-referential refers to being internally focussed, based on the individual’s or group’s own experience and lacking in external peer review.

Single-, double- and triple-loop thinking

Apply single-loop thinking (much like quality control) to ensure you not only maintain high standards in what you practice but improve on them when necessary. Reflect on core assumptions (double-loop thinking) and even the underlying values (triple-loop thinking) or paradigms that underpinned an action or strategy whether it was successful or not. Capture the learning explicitly. Do things differently in future. This kind of thinking also helps prioritise the relevance of incoming knowledge (and hence manage information overload more effectively). All three kinds of thinking are fundamental to effective adaptive management.



Unlearning

Unlearning means abandoning the application of previous knowledge in favour of newer knowledge considered to be more appropriate (Nystrom and Starbuck, 1984).

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APPENDIX G

KNP ASSOCIATED RIVER MONITORING

APPENDIX G: KNP ASSOCIATED RIVER MONITORING

The KNP is currently consolidating all its river related monitoring requirements within the SANParks and KNP Strategic Adaptive Management (SAM) system, associated with Thresholds of Potential Concern (TPC). A brief summary is given below for the Crocodile and Sabie Rivers.

1) River flow monitoring

Not strictly assessed as a TPC within the SANParks SAM system anymore, but forms part of a Rapid Response System. Here, different feedbacks are initiated within and outside the KNP if/when various river discharges ('Worry-levels') are reached. This forms part of the operational component within the SAM system.

Although the KNP is still making use of the In-stream Flow Requirement measurements available for the Crocodile River (as benchmark to monitor river flows against), this will soon be replaced with dynamic estimates of the Ecological Reserve (calculated every 3 days), associated with the Comprehensive Ecological Reserve Determination process for the Crocodile River. The same is envisaged for the Sabie River once the relevant modeling systems are in place, however, the IFRs will currently be kept for the Sabie River.

Crocodile River:- Three gauging stations are located along the river within the KNP, i.e. Riverside (X2H046), Tenbosch (X2H016) and Komatipoort (X2H036). However, flow is currently being assessed using the Tenbosch gauging weir.

Sabie River:- Two gauging stations are located along the river within the KNP, i.e. Skukuza (X3H021) and Lower Sabie (X3H015). However, flow is currently being assessed using the Skukuza gauging weir.

2) National Aquatic Ecosystem Health Monitoring Programme (NAEHMP) - River Health Program (RHP) associated monitoring

The following RHP associated sites on the Crocodile and Sabie Rivers are monitored by SANParks staff every 2-3 years (since 1996):

Crocodile River:-

Matjulu	S 25 ⁰ 31. 089'	E 31 ⁰ 23. 474
Malelane Brug	S 25 ⁰ 27. 611'	E 31 ⁰ 32. 110
Seringeiland	S 25 ⁰ 23. 732'	E 31 ⁰ 34. 354
Mhlambane	S 25 ⁰ 23. 608'	E 31 ⁰ 36. 904
Krokodilbrug	S 25 ⁰ 21. 711'	E 31 ⁰ 53. 584
Tenbosch	S 25 ⁰ 21. 869'	E 31 ⁰ 57. 543
Nkongoma	S 25 ⁰ 23. 472'	E 31 ⁰ 58. 576
Komati confluence (KOMCON)	S 25 ⁰ 26. 158'	E 31 ⁰ 58. 516

Sabie River:-

Sekurakwane (IFR3)	S 24 ⁰ 59. 371'	E 31 ⁰ 17. 361
Skukuza (IFR4)	S 24 ⁰ 59. 204'	E 31 ⁰ 35. 135
Nwatimhiri (IFR5)	S 25 ⁰ 03. 555'	E 31 ⁰ 49. 106

Fish monitoring:-

The Fish Rapid Assessment Index (FRAI) currently forms the core of the KNP associated RHP related monitoring for fish. It is based on the categorization of the fish community according to an intolerance rating. This includes: trophic preference and specialization, requirement for flowing water during different life-stages, and requirement for habitats with unmodified water quality. Results of the FRAI are expressed numerically, and as a ratio of observed conditions versus conditions that would have been expected in the absence of human impacts. This percentage is linked to an integrity or Ecological Category (EC) or Class. The numerical scores indicate the direction of change in the system.

Macro-invertebrate monitoring:-

Currently, the South African Scoring System (SASS) methods are used for monitoring the macro-invertebrate status in the KNP rivers, under the RHP. SASS is a standardised bio-assessment method for monitoring macro-invertebrates. Samples are taken from three biotopes - stones, vegetation and gravel/sand/mud. Identification of macro-invertebrate assemblages is at the family level. The ecological status of each site is determined by calculating the number of taxa found and analysis of relevant SASS scores.

Additionally, capacity is being generated within the KNP for interpreting SASS data within the Macro-invertebrate Rapid Assessment Index (MIRAI). MIRAI was developed to determine the EC associated with different South African rivers, using macro-invertebrates as indicators of change in relevant environmental variables.

TPCs:-

No specific TPCs are associated with the broader results from the RHP. However, trends in EcoStatus scores, or EC associated with Fish and Macro-invertebrates will be assessed using FRAI and MIRAI. This will be used to determine the direction and magnitude of changes in the EC of the river (in relation to an agreed upon Management Class).

3) **Measuring compliance with the RQOs: Ecological Water Resource Monitoring (EWRM)**

According to Kleynhans *et al.* (2009), it is envisaged that EWRM will be undertaken within a Structured Decision Making (SDM) framework following the principles of SAM. This will provide a decision framework within which monitoring results can be interpreted in terms of the attainment of specified objectives. This relates directly to EcoSpecs and TPCs formulated to assess attainment of an EC. Essentially, before biotic indicators are assessed (using RHP tools: FRAI, MIRAI), RHAM data will be used to assess habitat suitability for indicator in-stream biota (fish, macro-invertebrates) and riparian vegetation, representing suitable indicators of the EC of the river. The premise of RHAM is that suitable habitat conditions will indicate the likely presence, abundance and frequency of occurrence of particular biota. The process requires baseline conditions to measure

against subsequent change in habitat conditions, and impact on the indicator biota. Available data and expert knowledge is used to associate particular habitat conditions with different ECs.

TPCs:-

TPCs (EcoSpecs) associated with the RHAM system are currently in various stages of development for the Crocodile and Sabie Rivers, and will be incorporated into the SAM system when available. This comprises work being done under the auspices of Department of Water Affairs.

In 2010, the KNP will be testing the RHAM monitoring methods at pre-selected sites along the Crocodile River within the KNP. The intention is to start putting in place the procedures and methods for testing the RQOs, and ultimately effectiveness of the Ecological Reserve (via Progressive Realization).

4) Specific KNP Biodiversity Objectives related monitoring

In addition to the RHP and EWRM, the following TPCs are being pursued by the KNP associated with biodiversity changes taking place inside the KNP, along the Crocodile and Sabie Rivers:

TPCs to assess sedimentation and habitat loss

Several of the larger rivers in the KNP are characterized by an unusual mix of both bedrock (underlying geological) and sandy sedimentary influence within the channel. The variable mix of sandy and underlying rocky areas creates a high degree of morphological (“habitat”) complexity, ranging from slow-flowing, very sandy areas to very fast bedrock rapids, and this creates many niches for biota. For example, the rivers of the KNP have the highest fish species diversities in South Africa, many species are critically dependent on the fast-flowing, well-oxygenated bedrock in-stream habitats (Rountree *et.*, *al* 2008).

Scientific research has shown that the Crocodile, Sabie, Olifants and Letaba rivers within the KNP fluctuate in space and time between various rocky and sandy conditions (Carter

and Rogers 1995; Rountree *et al.* 2000; Rountree and Rogers 2004). There has, however, never been a time when there was no bedrock influence in these rivers – under natural conditions there is tendency for some areas to become rockier whilst simultaneously other sections of the river became sandier (Rountree *et al.*, 2008). Land-use changes within the upstream catchment (outside the KNP) have resulted in reduced flows, reduced floods and increased sediment inputs. These are thought to be causing a reduction in the availability of bedrock habitat due to the increased sediment storage, resulting from the increased sediment inputs as well as decreased sediment transport due to the reduced flows (Rountree *et al.*, 2008).

A TPC has been developed using best available knowledge about the geomorphology of the KNP river systems. The TPC is used to 'red-flag' potential sedimentation problems before these exist, or for providing relevant ecosystem information if rehabilitation action is required. The approach is based on an historical aerial photographic analysis from the 1940s to the present, involving an assessment of a) change in the size of the active channel (habitat availability) and b) amount and state of exposed bedrock habitats important for biota (function). Change in the active channel width, and a simple geomorphic scoring index is used to determine river condition associated with a) and b) above, respectively. This information is used to determine geomorphic related trends over time, relative to a desired river state (or EC). The monitoring has been designed to be simple and practical, with standard GIS techniques used to delineate sites explicitly.

TPC to assess biotic response to changes in sedimentation and flow regime

This TPC was developed along the highly bio-diverse Sabie River during the Kruger National Park River Research Program of the 1990s, and is currently being tested and refined by SANParks for this river. It deals with concerns about increasing and unnatural sedimentation within the rivers that would lead to a loss in bedrock influence via smothering of exposed rocky areas. The result is a loss of regeneration niches for woody plant species, therefore leading to a loss in biodiversity, going against the KNP's primary mandate.

The riparian tree species *Breonadia salicina* was recognised as a good indicator of bedrock influence because it grows in close proximity to the active channel and in close

association with bedrock related habitats (van Coller, 1993). Additionally, *B. salicina* germinates abundantly on any substrate type, however, it only establishes on exposed bedrock because this substrate allows for sufficient anchorage during flooding events, thus vital for individual persistence. Hence, the population structure exhibited by *B. salicina* will be detrimentally affected by increased sedimentation during the establishment phase of its life cycle, with adult populations progressively declining in abundance (MacKenzie *et al.*, 1999). The KNP is currently refining the thresholds parameters associated with an acceptable population structure of *B. salicina*, acting as an indicator of wider biodiversity conditions within the Sabie River.

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APPENDIX H

**CURRENT COMPLIANCE ENFORCEMENT
PROCEDURES**

APPENDIX H: CURRENT COMPLIANCE ENFORCEMENT PROCEDURES

PROCEDURE FOR ENFORCING COMPLIANCE IN TERMS OF SECTIONS 19, 20 AND 53 OF THE NATIONAL WATER ACT, NO. 36 OF 1998 (NWA)

1. Most of the complaints and queries are received through the one stop shop through the department toll free line 0800 200 200.
2. Within 5 working days of receipt of the complaint or query an acknowledgement letter is submitted to the complainant see attached format for the letter used.
3. Within 10 working days an investigation must be conducted to ascertain the alleged unlawful activity (water use or pollution related).
4. Within 30 working days, a feed back report is compiled and forwarded to the complainant to update him/her on the measures the department has taken to respond to his/her complaint or query.
5. In the process it becomes necessary that a directive should be issued to stop the unlawful water use or pollution. In such cases the following process is followed,

SECTION 19 AND 53 NOTICE AND DIRECTIVE

Step 1: Issue a notice of intention to issue a directive, structure of a notice in terms of section 19 and 53 of the NWA

- Logo and the address
- Heading
- Delegation (I so and so in terms of powers delegated to me by the minister)
- State the section of the NWA for which the intended directive is to be issued against.
- Clearly indicates the sections of the NWA which have been contravened.
- Indicate the reasonable grounds for believing that the NWA has been contravened.
- Complaint received.
- Inspection conducted.
- Lab results if any
- Make provision for the person to make representation in terms of PAJA within certain time frame (not less than 2 days)
- NB indicate what the intended directive will require the person to do.
- Also bring to the person's attention that failure to make representation will leave the dept with no other option but to issue the directive.
- Also indicate that in terms of section 151 of the NWA, failure to comply with a directive is a criminal offence.

Step 2: Once the person issued with the notice makes representation, the representation assessment committee, which currently meets once a month will assess the representation and determine if the person has provided reasons that are compelling enough to stop the department from issuing the directive, if yes then the department will withhold the issuing of the directive and if no, the a directive will be issued.

Step 3: Before issuing the directive, a letter is issued to indicate to the person that the department is rejecting his/her representation because the person has failed to provide compelling enough reasons to stop the department from issuing the directive.

Step 4: A directive will be issued which must be in the following format

- Logo and the address
- Heading
- Reasons
 - Section of the NWA which the directive is issued against
 - Section of the NWA which have been contravened
 - Pre- directive or notice of intention to issue a directive issued
 - Representation that was received
 - Reasons provided by the dept why the representation could not be accepted and any other correspondence.
- Directive
 - Indicate the delegated authority (I so and so duly authorised in terms of the powers delegated to me)
 - Indicate the section of the NWA the person is directed against
 - Clearly spell out what the person is directed to do and indicate the time frames
- Implication
 - Indicate the implication of failing to comply with the directive which may include
 - Legal Action taken against the person
 - Necessary steps taken by the department in terms of section 53(2) and section 19(4) of the NWA
 - Cost may be recovered from him in terms of section 19(5)
 - Also indicate that failing to comply with a directive constitutes an offence in terms of section 151(1) and that in terms of section 151(2) any one who is found guilty of an offence is liable to a fine and or imprisonment.
- Appeal
 - It is important to indicate to the person that in terms of section 148(1) of the NWA they may appeal against the directive but also that in terms of section 148(2) the appeal does not suspend the directive.
 - Provide the person with the contact details of the Water Tribunal Chairperson.

SECTION 20 DIRECTIVE (CONTROL OF EMERGENCY INCIDENT)

- A pre-directive or a notice of intention to issue a directive is not required because we are dealing with an emergency and the delay may cause irreversible damage to the water resource, this directive is issued to confirm the verbal directive already issued on site.

- You receive a call that a truck carrying diesel has overturned and spilled diesel on the surface and nearby there is a stream or that a dirty water dam in a mine is spilling into a water resource.
- You go on site and whilst on site you observe that the diesel is moving in such a speed that soon it will find itself into a water resource and also due its composition and it can infiltrate the soil and reach groundwater, or you go to the mine and you observe that indeed the dam is spilling polluted water into the water resource.
- Whilst on site you issue a verbal directive in terms of section 20(4)(d) and the verbal must be confirmed in writing within 14 days in terms of section 20(5), failing which it will be deemed to have been withdrawn
- **Format and Structure of a section 20 of the NWA Directive.**
 - - Logo and the address
 - Heading
 - Reasons
 - Section of the NWA which the directive is issued against
 - Give details of the pollution incident (date, time, area, river/stream, catchment, and the substance that has spilled)
 - Indicate the details of the verbal directive that was issued.
 - Details of all the site visit conducted after the incident was reported
 - Directive
 - Indicate the delegated authority (I so and so duly authorised in terms of the powers delegated to me)
 - Indicate the section of the NWA the person is directed against
 - Clearly spell out what the person is directed to do and indicate the time frames
 - Also indicate the contact person and the address where the reports and any other correspondence must be submitted to.
 - Implication
 - Indicate the implication of failing to comply with the directive which may include
 - Legal Action taken against the person
 - Necessary steps taken by the department in terms of section 20(6) of the NWA
 - Indicate that the cost may be recovered from him in terms of section 20(7) read with section 20(2)
 - Also indicate that failing to comply with a directive constitutes an offence in terms of section 151(1) and that in terms of section 151(2) any one who is found guilty of an offence is liable to a fine and or imprisonment.
 - Appeal

- It is important to indicate to the person that in terms of section 148(1) of the NWA they may appeal against the directive but also that in terms of section 148(2) the appeal does not suspend the directive

CRIMINAL CASES

Section 151 of the NWA provided a list of offences; the following offences relevant to section 19 and 20 have been listed

Section 151 of the NWA: Offences

(1) No person may -

(a) use water otherwise than as permitted under this Act;

(d) fail to comply with a directive issued under section 19, 20, 53 or 118;

(i) unlawfully and intentionally or negligently commit any act or omission which pollutes or is likely to pollute a water resource;

(j) unlawfully and intentionally or negligently commit any act or omission which detrimentally affects or is likely to affect a water resource;

(2) Any person who contravenes any provision of subsection (1) is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years or to both a fine and such imprisonment.

NB: Department can approach the SAPS to open criminal cases against anyone who has committed a section 151(1) offence. However a directive has been issued that as we are aware the Minister is always cited as a first respondent in all DWA legal cases. In the context of good governance we are kindly requested to inform the Minister through the DG's office of our intention to take a legal action against an employee, member of the public, stakeholder or entity.

APPENDIX I

INFORMATION AND DECISION NEEDS FOR RIVER SYSTEMS OPERATIONS

APPENDIX I: INFORMATION AND DECISION NEEDS FOR RIVER SYSTEMS OPERATIONS

CROCODILE RIVER SYSTEMS OPERATIONS INFORMATION AND DECISION NEEDS

ANNUALLY

<u>INFORMATION NEEDS</u>	<u>DECISIONS REQUIRED</u>
<ul style="list-style-type: none"> - <u>Previous Year Water Use vs. Orders</u> - <u>Water Orders & Distribution- current year</u> - <u>Forecast of expected conditions</u> - <u>Dam, River & Rainfall Levels & compare to history</u> - <u>Scenarios (reserve, IIMA, new dams, WCDM, all towns strategies)</u> - <u>Bio Physical TPC info</u> - <u>Learning: Technical, social, sustainability, economic</u> - <u>Reflection/Evaluation of progress with new system and change/adaptations required</u> 	<ul style="list-style-type: none"> - <u>Annual Water Allocations</u> - <u>Probability & Magnitude of Restrictions on Allocation</u> - <u>History of Previous Decisions</u> - <u>Discuss / Review Operating Rules</u> - <u>Learning Strategy, reflection</u> - <u>Impact of Reserve implementation on River Health</u> - <u>On track to longer-term plan/target for Reserve implementation</u>

QUARTERLY

<u>INFORMATION NEEDS</u>	<u>DECISIONS REQUIRED</u>
<ul style="list-style-type: none"> - <u>Water Orders and Use</u> - <u>Prevailing Catchment conditions</u> - <u>Dam, River & Rainfall Levels & compare to predictions</u> - <u>Forecast of expected conditions</u> - <u>Dam, River & Rainfall Levels & compare to history</u> - <u>Scenarios</u> - <u>Check points on Bio-physical TPCs</u> - <u>Status of water quality and trends</u> 	<ul style="list-style-type: none"> - <u>Review of Prevailing Catchment conditions</u> - <u>Review Restriction Levels on allocations</u> - <u>Review Restriction Levels on dams</u> - <u>Check implementation of annual decisions</u> - <u>Review monitoring, TPC refinements, management action potential</u> -

MONTHLY

<u>INFORMATION NEEDS</u>	<u>DECISIONS REQUIRED</u>
<ul style="list-style-type: none"> - <u>Water Orders and Use (demands)</u> - <u>Report Back on Weekly operations, actions, decisions etc.</u> - <u>Prevailing Catchment Conditions</u> - <u>Dam Levels</u> 	<ul style="list-style-type: none"> - <u>Review of Prevailing Catchment conditions</u> - <u>Review Long term model output</u> - <u>Review year-to-date Water Use vs Order</u> - <u>Review Demands</u> - <u>Possible Restriction Scenarios</u> - <u>Probable Dam releases</u> - <u>Data and information Exchange</u> - <u>International Obligation implementation</u> - <u>Reserve Status</u>

WEEKLY / DAILY

<u>INFORMATION NEEDS</u>	<u>DECISIONS REQUIRED</u>
<ul style="list-style-type: none"> - <u>Prevailing Conditions (flows, rainfall, releases, restrictions, levels, trajectories, reserve benchmark etc.)</u> - <u>Short Term Forecast of expected conditions</u> - <u>Short term water demands</u> - <u>Communications regarding decisions and actions</u> 	<ul style="list-style-type: none"> - <u>Dam Releases</u> - <u>Short term restrictions on users</u> - <u>When to invoke the rapid response system within KNP: Worry levels</u>

APPENDIX J

ICMA ORGANOGRAMME

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