D5 Water Management Area 5: Inkomati

D5.1 Introduction

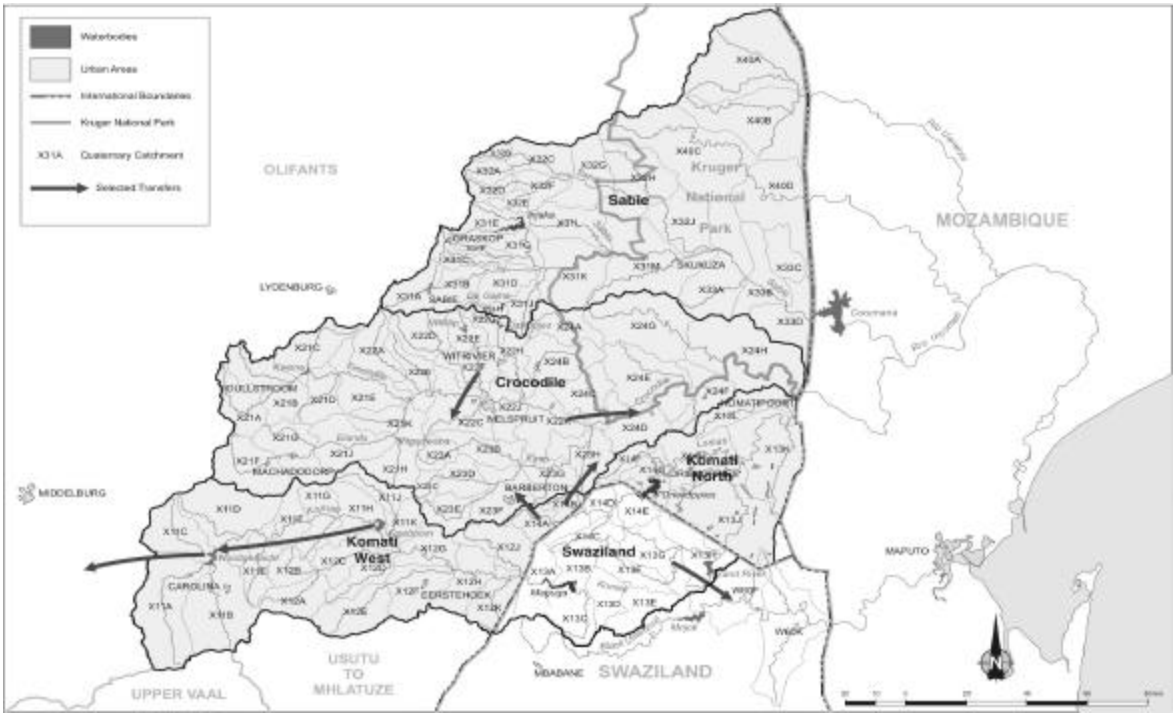
The Inkomati water management area is situated in the north-eastern part of South Africa and borders on Mozambique and Swaziland. As shown on **Figure D5**, all the rivers flow through Mozambique to the Indian Ocean. Mozambique is therefore partly dependant on water from South Africa, while South Africa is committed to honouring its obligations in this respect. The Komati River first flows into Swaziland and re-enters South Africa before flowing into Mozambique. Topographically the water management area is divided by the Great Escarpment into a western plateau and sub-tropical Lowveld in the east. Rainfall varies from 400 mm to over 1 200 mm per year in the mountains.

Economic activity is mainly centered around irrigation and afforestation, with related industries and commerce, as well as strong eco-tourism. A key feature in the water management area is the renowned Kruger National Park, with the Sabie River which flows through the park as one of the ecologically most important rivers in the country. The Crocodile River forms the southern boundary of the KNP.

Dams have been constructed on all the main rivers or their tributaries and surface water resources in the water management area are generally well regulated. An important aspect being the joint management by South Africa and Swaziland, by the Komati Basin Water Authority (KOBWA) of part of the water resources of the Komati River. Potential for further water resource development exists on the Crocodile River (Kaap tributary), the Komati River and the Sabie River (Sand tributary), but will probably only be feasible for domestic and high value uses. Attributable to the well-watered nature of most of the water management area, use of groundwater is relatively small. Most of the present yield from the Komati River west of Swaziland is transferred to the Olifants water management area for power generation.

Future growth in population is expected to be moderate, and to be concentrated in the urbanized areas, with a decline in some rural areas. With about 90 per cent of the total water requirements within the water management area by the irrigation and forestry sectors, only a small natural growth in overall water requirements is foreseen.

Figure D5: Base map of the Inkomati water management area



D5.2 Key statistics relevant to the Inkomati water management area

Tables D5.1 to 5.6 contain a breakdown per sub-area, of the information given in Tables 2.1 to 2.2 of Chapter 2, with respect to the Inkomati water management area. Information with respect to Swaziland is given to provide a more comprehensive perspective, but falls outside of the Inkomati water management area which is limited to South African land area only. The information given below primarily relate to the standardised data base, and it should be noted that more accurate or recent information may be available from other sources.

Table D5.1: Natural Mean Annual Runoff and Ecological Reserve (million m³/a)

Component / Sub-area	Natural MAR (1)	Ecological Reserve (1, 2)
Komati (W Swazi)	749	239
Komati (N Swazi)	129	25
Swaziland (3)	517	100
Crocodile	1 277	328
Sabie (4)	866	316
Total for WMA	**3 539**	**1 008**

1) Quantities given are incremental, and refer to the sub-area under consideration only.
2) Total volume given, based on preliminary estimates. Impact on yield being a portion of this.
3) Includes the Komati and Lomati catchments in Swaziland.
4) Includes the Uanetse and Mássintonto catchments in SA.

Table D5.2: Available yield in the year 2000 (million m³/a)

Component / Sub-area	Natural resource		Usable return flow			Total local yield
	Surface water (1)	Ground-water	Irrigation	Urban	Mining and bulk	
Komati (W Swazi)	70	1	0	1	0	**72**
Komati (N Swazi)	216	2	22	0	1	**241**
Swaziland	175	1	3	0	0	**179**
Crocodile	281	2	27	7	10	**327**
Sabie	115	3	6	0	0	**124**
Total for WMA	**857**	**9**	**58**	**8**	**11**	**943**

1) After allowance for the impacts on yield of: ecological component of Reserve, river losses, alien vegetation, dry land agriculture and urban runoff. Also includes Driekoppies Dam, but not the soon to be completed Maguga Dam.

Table D5.3: Water requirements for the year 2000 (million m³/a)

Sector/ Sub-area	Irrigation	Urban (1)	Rural (1)	Mining and bulk industrial (2)	Power generation (3)	Affore-station (4)	Total local require-ments
Komati (W Swazi)	23	3	3	0	0	23	**52**
Komati (N Swazi)	223	3	6	1	0	12	**245**
Swaziland	149	1	4	0	0	25	**179**
Crocodile	273	37	7	23	0	92	**432**
Sabie	69	21	4	0	0	46	**140**
Total for WMA	**737**	**65**	**24**	**24**	**0**	**198**	**1 048**

1) Includes component of Reserve for basic human needs at 25 l/c/d.
2) Mining and bulk industrial water uses which are not part of urban systems.
3) Includes water for thermal power generation only. (Water for hydropower, which represents a small portion of power generation in South Africa, is generally available for other uses as well.)
4) Quantities given refer to impact on yield only.

Table D5.4: Reconciliation of water requirements and availability for the year 2000 (million m³/a)

Component / Sub-area	Local yield	Transfers in (2)	Local requirements	Transfers out (2)	Balance (1)
Komati (W Swazi)	72	0	52	97	(77)
Komati (N Swazi)	241	0	245	35	(39)
Swaziland	179	0	179	0	0
Crocodile	327	12	432	28	(121)
Sabie	124	0	140	0	(16)
Total for WMA	**943**	**0**	**1 048**	**148**	**(253)**

1) Brackets around numbers indicate negative balance.
2) Transfers into and out of sub-areas may include transfers between sub-areas as well as transfers between WMAs. Addition of the transfers per sub-area therefore does not necessarily correspond to the total transfers into and out of the WMA. The same applies to Tables D 5.5 and D 5.6.

Table D5.5: Reconciliation of water requirements and availability for the year 2025 base scenario (million m³/a)

Component / Sub-area	Local yield (1)	Transfers in	Local requirements (2)	Transfers out	Balance (3)	Potential for development (4)
Komati (W Swazi)	72	0	51	97	(76)	50
Komati (N Swazi)	241	0	246	35	(40)	0
Swaziland	244	0	179	0	65	0
Crocodile	329	12	447	28	(134)	64
Sabie	187	0	165	0	22	0
Total for WMA	**1 073**	**0**	**1 088**	**148**	**(163)**	**114**

1) Based on existing infrastructure and infrastructure under construction in the year 2000 (includes both Maguga and Inyaka Dams). Also includes return flows resulting from growth in requirements.
2) Based on growth in water requirements as a result of population growth and general economic development. Assumed no general increase in irrigation.
3) Brackets around numbers indicate negative balance.
4) Based on the construction of Boekenhoutrand and Mountain View Dams.

Table D5.6: Reconciliation of water requirements and availability for the year 2025 high scenario (million m³/a)

Component / Sub-area	Local yield (1)	Transfers in	Local requirements (2)	Transfers out	Balance (3)	Potential for development (4)
Komati (W Swazi)	73	0	53	97	(77)	50
Komati (N Swazi)	241	0	247	35	(41)	0
Swaziland	244	0	179	0	65	0
Crocodile	337	12	489	28	(168)	64
Sabie	187	0	163	0	24	0
Total for WMA	**1 082**	**0**	**1 131**	**148**	**(197)**	**114**

1) Based on existing infrastructure and infrastructure under construction in the year 2000 (includes both Maguga and Inyaka Dams). Also includes return flows resulting from growth in requirements.
2) Based on high growth in water requirements as a result of population growth and high impact of economic development. Assumed no general increase in irrigation.
3) Brackets around numbers indicate negative balance.
4) Based on the construction of Boekenhoutrand and Mountain View Dams.

D5.3 Key elements of the broad strategic perspectives for the Inkomati water management area

Of primary importance with regard to the Inkomati water management area, are the implementation of the Reserve and the release of minimum flows to Mozambique. Of the total mean annual runoff of 3 539 million m^3 per year which originates from the water management area and the Swaziland portion of the Komati River catchment, an estimated 1 881million m^3 per year on average, currently flows into Mozambique.

According to an agreement between the three countries, South Africa and Swaziland are obliged to release a minimum flow of 63 million m³ per year to Mozambique at Komatipoort (55% of which comes from the Komati River and 45% from the Crocodile River). Water requirements in South Africa have, however, grown to the extent that the total yield available would be absorbed by these if fully applied thereto. The deficits reflected in Table D 5.4 are therefore numerically about equal the provision for the ecological component of the Reserve together with the obligations to Mozambique. No quantitative agreements exist with respect to the other rivers shared with Mozambique.

The bulk of the water use in the water management area is by irrigation and afforestation, and the expectation is that new resource development is likely to be too costly for the expansion of these uses. It is evident that, with due consideration given to the options for reconciling the requirements for and availability of water as described under 2.5, compulsory licensing will have to be applied to reapportion water use in the water management area. This is to be preceded by the detailed determination and careful assessment of the requirements for the ecological component of the Reserve.

Specific reservations and national authorisations with respect to the Komati water management area comprise:

- Transfer of water to the Olifants water management area for power generation, at the current capacity of the transfer scheme (approximately 100 million m³ per year). (The provisions of the Treaty between SA and Swaziland can accommodate a transfer of 130 million m³ per year out of the catchment by SA.)

- Water supplied to South African land area by the Komati Basin Water Authority (which includes releases for environmental purposes).

- Water to be released to Mozambique to honour international commitments. This currently amounts to 63 million m³ per year, but is subject to revision once the Interim Incomaputo Agreement (currently subject to negotiation), is signed.

- All water resource developments which may impact on neighbouring countries, will be subject to national authorisation.