7 MTATA KEY AREA – WATER RESOURCE OVERVIEW ISSUES AND STRATEGIES

7.1 INTRODUCTION

This chapter describes the characteristics of the Mtata key area, the available water, water requirements and the yield water balance based on updated information that was sourced during the ISP investigation. The water resource management issues, constraints and opportunities in the key area are also described. This is mainly based on the interviews conducted with DWAF Regional Office personnel, the two ISP workshops, the Mtata River Basin Study (MRBS) that was completed in 2001 as well as information contained in the NWRS. The detailed strategies to address these issues, constraints and opportunities for the use and management of the water resources of the key area are described in Part 2 of this ISP.

The Mtata Dam is the only significant water resource development in the area. The dam, with a capacity of 253,7 million m^3, is situated in the upper reaches of the Mtata River catchment and supplies water to the town of Mtata, the largest water user in the study area. The allocation to Mtata is 60 Ml/d although the actual average is only about 14,5 million m^3/a. The dam is also used by Eskom to generate hydropower at the First and Second Falls. Table 7.2 lists the dams in the Mtata key area.

7.2 MTATA KEY AREA CHARACTERISTICS

The Mtata key area is shown in Figure 7.1. The main river is the Mtata River which drains the T20 catchment. There are also several smaller coastal rivers with the Mngazi River (T70) the most significant. The T80 catchment is also in the key area. The total catchment area is 5 526 km^2. The mean annual runoff (MAR) of the Mtata River catchment is approximately 382 million m^3.

The MRBS gave the total population of the Mtata key area as approximately 630 000 in 1995, and projected it to decline to 566 000 in the year 2020 for the low growth scenario, and 607 000 for the high growth scenario. However, the demographic study commissioned by DWAF (MarkData, 2001) for the NWRS, indicated that the 1995 population of the Mtata key area was approximately 720 000. The ISP strategies have been based on the information contained in the NWRS.

Table 7.1: Mtata key area population distribution

	1995 Population	Estimated 2025 Population	Average annual growth rates
Rural	514 000	464 200	-0.34%
Urban	205 700	217 100	0.18%
Total	719 700	681 300	-0.18%

Although the Mtata key area is heavily populated, it has a low level of economic development. The level of economic activity has been gradually decreasing. This is to some extent offset by growth in the informal sector. Most industries and businesses which once flourished in the area and particularly in Mtata town, the former capital of the Transkei, have since relocated, mainly to East London because of better access to markets. The subsidy structures which once favoured investment in Mtata are no longer in place.

There are also several smaller rural and coastal towns in the key area. Rural poverty and lack of employment present serious problems. Major intervention would be required to bring about an economic turnaround in this key area. Any developments should be focused on creating employment and poverty eradication. The Provincial Growth and Development Strategy identified the urgent need to stimulate economic development in the whole ISP area and particularly the Mtata key area.

The agricultural sector is poorly developed and largely of subsistence nature. Small patches of irrigation takes place with water use estimated at about 2 million m^3/a. Langeni Forest is a major contributor to the economic value added and employment of this key area. There are two main sawmills in the area, Langeni and KwaBhaca. Relatively little manufacturing based on commercial timber is taking place.

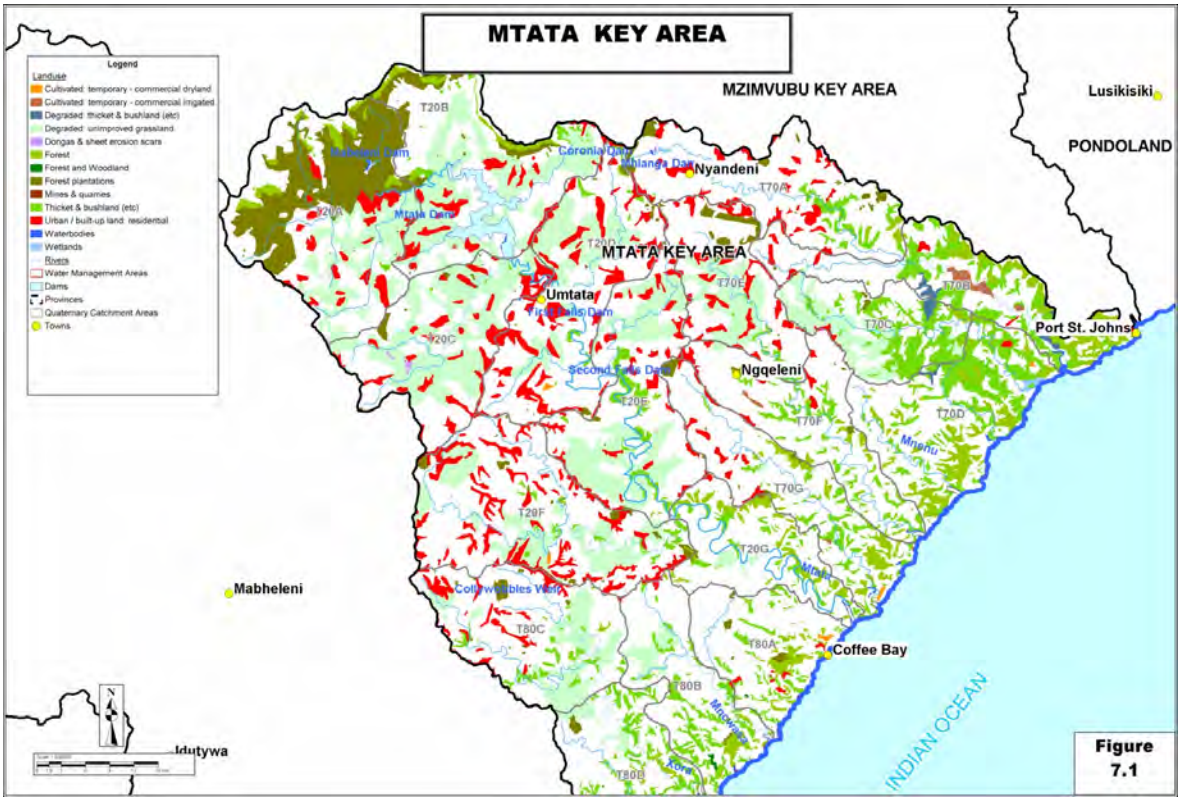

Table 7.2: Dams in the Mtata River key area

DAM NAME	RIVER	CATCHMENT AREA (km^2)	GROSS CAPACITY (million m^3)	YIELD (1:50 YEAR) (million m^3/a)
Mtata Dam	Mtata River	886	253.7	136
Mabeleni Dam	Mhlahlane River	10	2.23	1.09
Corana Dam	Corana River	5	0.95	0.34
First Falls Dam	Mtata River	Included below	0.844	N/A
Second Falls Dam	Mtata River	1690	1.2	N/A
Mhlanga Dam	Mhlanga River	15	1.53	0.78
Bulolo Main Dam	Bulolo River	Unknown	0.59	0.33
Upper Bulolo Dam	Bulolo River	Unknown	0.03	0.05
Nzwakazi Dam	Unnamed Tributary	Unknown	0.07	0.10
Lubanzi Dam	Unnamed Tributary	Unknown	Unknown	Unknown

7.3 COMPARISON OF THE NWRS WITH UPDATED ISP WATER BALANCE

A comparison of the NWRS figures with the information obtained for the ISP on the water resource availability and use was undertaken for the Mtata River key area. The basis of the comparison was discussed in Section 4.4.

Table 7.3 shows the water availability comparison.

Table 7.3: Comparison of the water availability in the Mtata River key area (year 2000) between NWRS and ISP

Resource category	Available / Impact on yield (million m³/a)	
	ISP	NWRS
Gross available surface water resource	172	162
Subtract:		
- Ecological Reserve (Impact on yield)	29	29
- Invasive Alien vegetation (Impact on yield)	4	4
Net surface water resource	*139*	*129*
Ground water	1	1
Return flows	6	6
Total local yield	146	136

The net surface water available in the ISP was found to be 10 million m³/a higher than the NWRS figure. This is because the yields of the smaller dams were not included in the NWRS. The ISP figures have been used in the reconciliation and the development of the strategies.

Table 7.4 presents a comparison of the water requirements between the NWRS and the ISP for the year 2000. Approximately 293 ha are currently irrigated in the Mtata key area as determined in the MRBS. The total irrigation water requirement is approximately 2 million m³/a (DWAF, 2001) (17). In the MRBS the potential for sustainable irrigation in this key area was estimated at 1 200 ha. This is located mainly in the Mngazi (507 ha) and the Mtata (497 ha) river catchments. The NWRS quoted an irrigation use of 4 million m³/a, but the MRBS figure is more recent and regarded as more reliable. The demand of the various sectors is given in table 7.4.

Table 7.4: Comparison of water requirements (year 2000) between NWRS and ISP

User sector	Requirement/impact on yield (million m^3/a)	
	ISP	NWRS
Irrigation	2	4
Urban	15	15
Rural	11	5
Industrial and mining	0	0
Afforestation	29	29
Total requirement	57	53

There is a significant difference in the water requirements for the rural sector. Approximately half of the difference is attributable to stock watering which was not ncluded in the NWRS figure. Cattle farming is important in this key area and stock watering is therefore critical. The revised figure was used in the ISP.

7.4 WATER AVAILABILITY

The water sources of the Mtata key area are dominated by the Mtata Dam. Its capacity of 254 million m^3 is approximately 120% of the MAR. The 1:50 year yield of the dam is 136 million m^3 /a as shown in Table 7.2. The impact of the Reserve on the yield of this dam is not really relevant since most of the water is released into the river for hydropower generation. However, the temporal distribution of the releases has a significantly negative impact on the ecological functioning of the Mtata River downstream of the dam, including the estuary.

There are some smaller dams which contribute about 10 million m^3/a to the available yield of the Mtata key area. The total surface yield of the area is estimated at 146 million m^3/a after making allowance for the ecological Reserve and reduction in yield due to alien invasive plants.

The Mtata catchment is the one key area in the Mzimvubu to Mbashe ISP area in which invasive alien plants are a problem. The reduction in runoff due to invasive alien plants, situated mostly upstream of the Mtata Dam, is estimated at 8 million m^3/a and this reduces the yield of the Mtata Dam by an estimated 4 million m^3/a.

7.5 WATER USE

Unlike the other three key areas of this Mzimvubu to Mbashe ISP area, there is significant water use in the Mtata catchment. The largest water user by far is the forestry sector, which reduces run-off in the Mtata River by an estimated 37 million m^3/a. Forestry in the Mtata catchment is situated mostly upstream of the Mtata Dam where it has a major impact on the yield of this dam, reducing the yield by an estimated 29 million m^3/a.

The only other large water users are in the urban sector, with an estimated water use of 15 million m^3/a, and

the rural sector, with an estimated requirement of 11 million m³/a. The urban water requirement is mainly the requirement of Mtata and its surrounding communities.

There are two relatively small hydro-electric power generation schemes at First and Second falls on the Mtata River with a combined capacity of 17 MW and releases are made from Mtata Dam. Releases vary between about 6.9 m³/a in summer to 1,7 m³/a in winter.

Table 7.5: ESKOM operating rules

Season	Months	Load Factor (%)	MWC @100%	Flow (m³/s)
Summer	October to March	20	3.4	6.9
Winter	April to September	5	0.85	1.7

Table 7.4 lists all the known current (year 2000) consumptive water uses in the Mtata key area.

7.6 WATER RESOURCE ISSUES, CONSTRAINTS AND OPPORTUNITIES

7.6.1 Reconciliation of requirements and available water

The reconciliation of the available water (yield) and the water requirements is given in Table 7.6.

Table 7.6: Yield balance of the Mtata key area for the year 2000 (million m³/a)

Available water			Water requirements			Balance
Total local yield	Transfers in	Total	Local requirements	Transfers out	Total	
146	0	146	57	0	57	89

Based on the figures shown in Table 7.6, there is a substantial surplus in the Mtata key area. It must be borne in mind, however, that this surplus relates mostly to the yield available from the Mtata Dam, which is actually used non-consumptively for hydropower generation. The surplus yield is therefore mostly only available downstream of the hydropower stations at First and Second falls, and would be subject to the release patterns required for power generation.

Potential exists for the expansion of afforestation in the coastal areas. However, further afforestation will have an impact on the run-of-river yield and could severely impact on the freshwater requirement of the estuaries, such as the Mngazi, which are tourist attractions. The SEA study underway for forestry in the Eastern Cape should address the mitigation measures for these negative impacts. Strategy No 3.3 deals with afforestation.

7.6.2 Future scenarios

No changes are expected in the Mtata River key area in the short to medium term. In the long term the population is expected to decline (see Table 7.1). Projected growth in water demand to support improved levels of service is offset by the decline in the population although the demand nodes will shift to the urban areas. There is potential for increasing the area under irrigation by 1200 ha in the future. Irrigation of this area would require approximately 7 million m³/a of additional water. Approximately 3.5 million m³/a is required in

the Mtata catchment and the remainder in the Mngazi catchment. The reduction in power generation can make more water available for this use if the decision is made to reduce power generation from the Mtata River in the future.

7.7 MTATA RIVER KEY AREA STRATEGIC PERPSECTIVES

7.7.1 General

The Mtata key area is well-endowed with natural water resources. In the case of the Mtata catchment, these resources have been developed by the construction of the Mtata Dam. The yield of the Mtata Dam is used mostly for generating hydropower, and since this is a non-consumptive use, there are substantial surpluses downstream, depending on when power is generated. Use of that surplus water will have to fit in with the power generation pattern, or re-regulation storage will have to be provided.

The consumptive water use in this key area is mostly by commercial forests. There is an estimated 29 800 ha of exotic forests, situated mostly in the catchment of the Mtata Dam, and this has a large impact on the yield of the dam. The other significant water use is that of the urban sector, with the town of Mtata accounting for most of the urban water use in this key area. The area currently under irrigation (293 ha) is very limited considering the size of the catchment and the availability of water.

This surplus could be used for:

- Additional irrigation, with an area of approximately 1 200 ha being available in the Mngazi and Mtata River catchments
- Community garden projects
- More afforestation
- Other productive uses, such as tourism.

The strategy for this key area is essentially the same as that for the other key areas in the Mzimvubu to Mbashe ISP area, and that is, how best to utilise surplus water that is available. The following are the major issues and broad strategic perspectives that are specific to the Mtata key area.

7.7.2 Water balance and reconciliation strategic perspective

The Mtata River Basin Study [17] provides a comprehensive understanding of the available water as well as water requirements in the key area. There is an apparent surplus of nearly 90 million m^3/a, but the use of that water for future developments in the area will depend to a large extent on the continued use of water from the Mtata Dam for power generation. The yield of the Nqadu Dam, although relatively small, is also not being used, but there is a proposal to utilise it to supplement the water supplies to the Mhlanga Water Treatment Works.

The Mhlahlane water supply scheme has an allocation of 0.62 million m^3/a from the Mabaleni Dam (with a yield of approximately 1.09 million m^3/a). However, the scheme is currently relying on run-of-river yield. Although the assurance of supply is low, DWAF has never been requested to make releases from the Mabeleni Dam in terms of this allocation. The reliance on run-of-river yield for the Mhlahlane Water Supply Scheme, particularly during low flow, has a negative impact on the Reserve (see Strategy No 1.3).

7.7.3 Water resource protection strategic perspective

Reserve determinations for the rivers of the Mtata key area were undertaken at an intermediate level during the Mtata River Basin Study. As part of the MRBS, an intermediate Reserve determination was carried out for the Mtata River estuary, rapid Reserve determinations were made for the Xhora and Mngazi estuaries, and desktop estimates were made for the eight other estuaries in the Mtata key area. The recommended ecological flow requirements (EFR) for the estuaries are greater than the recommended requirements for the rivers.

The operation of the First and Second Falls hydro-electric power stations affects the flow regime by altering the natural flow pattern and thereby affecting the ecological functioning of the biota in the Mtata River. The Reserve determination that was done for the Mtata River indicates that the water requirements for the estuary are quite significant and that at certain times of the year there are shortfalls in supplying the EFR at the Mtata Estuary under the current release pattern for hydropower generation (JLB Smith Insitute, 2001) [(8)]. Another major problem encountered is that the EFR required during the low flow periods is being exceeded. This has a significant impact in that more freshwater than is required by the Mtata Estuary is being supplied. This has a negative impact on the biotic conditions of the estuary.

The income generated from hydropower generation is estimated at about R2.5 million per annum. There is a need to balance the benefits from hydropower generation with the opportunity cost of protecting the estuary for ecological reasons and for tourism development.

Eskom has indicated that the two hydropower schemes are of strategic importance in providing stable power distribution to the Eastern Cape. There is the potential that dependance on the Mtata hydropower stations can be reduced by the construction of another transmission line from the Eskom network. The recommended strategy is for DWAF to enter into discussion with Eskom regarding the future of the Mtata power schemes.

7.7.4 Water conservation and water demand management (WC/WDM)

There is a need for WC/WDM in the main urban areas of the Mtata key area. A situation assessment of the town of Mtata, funded by DWAF, identified high water losses (WRP, 2002) [(26)]. A key issue identified in the study concerns the relatively high volumes of sewage produced. The sewage flows are so high that the existing sewage treatment works are unable to cope, and as a result significant quantities of untreated sewage enter the Mtata River. This in turn poses serious health hazards to the many people who depend on the Mtata River for their water, and who are unable to satisfactorily treat the water. The excessive sewage flows will eventually lead to the expansion of the sewage treatment works, which is costly. If the sewage flows could be reduced through implementation of WC/WDM measures, expansion might not be required.

Large water losses and wastage also occur in other towns in the key area namely, Nqgeleni and Mqanduli. Although the WSDPs describe the need for implementation of WC/WDM measures in the urban areas of the Mtata key area, they do not clearly highlight the situation with regard to unaccounted-for water losses in existing water supply infrastructure and the potential for implementing WC/WDM measures. Most of the urban areas in the catchment are looking at augmenting their existing water supply infrastructure, whereas the proposed strategy is to ensure that the King Sabata Dalinyebo (KSD) Municipality, the water services authority in the key area, makes more efficient use of existing supplies through WC/WDM before new supplies are developed. This would eliminate or at least reduce the cost of further water resource development as well

as the extended sewage treatment works in areas such as Mtata. WC/WDM will improve the water resource protection measures required (particularly for the pristine estuaries) in the coastal rivers. WSDPs should describe all the measures required to implement WC/WDM.

7.7.5 Water quality management

The MRBS (DWAF, 2001) [17] identified that the water quality immediately downstream of the Mtata Dam and below the town of Mtata was very poor and may be deteriorating. Water quality problems have also been identified in the other catchments such as Mngazi. There are three main reasons for the deteriorating water quality situation, particularly in the Mtata River. These are:

(i) Overflow of untreated sewage into the Mtata River due to the capacity problems of the existing sewage pump stations and the sewage treatment works;

(ii) lack of sanitation infrastructure in rural and informal settlements in the catchments; and

(iii) soil erosion problems.

The impacts of these factors are discussed in detail in Strategy 2.2.

Most of the communities along the Mtata River use polluted river water for drinking purposes. There have been reported cases of water-borne diseases such as cholera in the catchment. A strategy is required to reduce pollution in the Mtata River and to implement water quality objectives in the Mtata key area.

The implementation of the dense settlement programme is essential in Mtata and surrounding areas.