

## 4. ALTERNATIVES

### 4.1 DO NOTHING

The NWA requires that the Reserve (basic human needs and ecological) receive the first right to available water. International obligations and strategic requirements must then be honoured. Water available after that can be allocated for beneficial use. The implication is that if no measures are taken to increase the ability to manage the water resources in the catchment, there will be shortages for irrigation and other developments and the socio-economic development in the region will be limited.

**Plate 4-1** and **Plate 4-2** show some of the measures that communities living in the study area are already taking to acquire water for domestic purposes.



**Plate 4-1: Women and children collecting water from the Groot Letaba River**



**Plate 4-2: Water vendor collecting water from the Groot Letaba River**

People in some villages in the study area are dissatisfied with the quality of the groundwater that is available. The groundwater has a high salinity which is unpleasant to drink and use in cooking. The foaming of washing powder may also be affected. These people are therefore resorting to collecting their own water from local rivers. Water collected is not treated, introducing potential health risks. Collecting

water can also use up significant amounts of women and children's time, preventing them from attending to other activities like education, income generation and household chores.

Uncontrolled water collection from rivers also impacts on the natural environment. The riparian vegetation, geomorphology of the river and fauna in the river can be impacted on by water collecting activities. If communities feel an increased need for water, they may even start to build informal unauthorized structures to assist them to collect water. Such structures could have increased impacts on the natural functioning of the river.

The "no project" option, although the easy way out for the DWAF, is therefore not considered the best alternative as it does not allow for the desired ability to manage and operate the water resource system, and is likely to result in increased negative social, economic and ecological states in the Province.

#### **4.2 REPLACING COMMERCIAL AFFORESTATION WITH NATURAL VEGETATION**

The 1998 Feasibility Study investigated replacing commercial forestry areas with natural vegetation in order to reduce this streamflow reduction activity with the intention of resulting in increased flows in the Groot Letaba River.

These investigations found that the positive impact on flows in the river as a result of this afforestation would be fairly limited due to the type of natural vegetation in the areas of concern also being relatively significant water users. The undesirable impact on the regional economy and local employment that deforestation would likely to result in also negate this option. The forestry areas are also in the upper regions of the catchment which is already highly controlled by existing dams. Replacing commercial afforestation with natural vegetation is therefore not considered a viable solution for to the need to improve the ability to manage the water resources in this area.

#### 4.3 CEASING EXPORT OF WATER TO THE SAND RIVER CATCHMENT

An annual allocation of 18, 5 million m<sup>3</sup> per annum is exported to Polokwane. This volume is extracted from the Dap Naude Dam and Ebenezer Dam in accordance with long standing allocations and permits. Polokwane does not have reasonable alternatives for importing water and therefore this option would impact significantly on water supply to the Polokwane area. The quantity of concern is also not sufficient to fulfil the requirements identified for this project.

#### 4.4 IMPROVE UTILIZATION EFFICIENCY OF IRRIGATION WATER

Irrigators in the Groot Letaba River system, and particularly those reliant on Tzaneen Dam, are regularly subject to restrictions on the water available.

Allocations are currently set at 50% of the annual quota as a result of the current drought conditions and low levels of water in storage. This has had a significant impact on fruit production and on the socio-economy of the region. The irrigation sector already relies on modern technology and has invested heavily in management and sophisticated equipment to improve water use efficiency. Inefficient flood irrigation methods are rarely encountered in the study area. There is therefore little scope for improvement in this sector.

#### 4.5 DECREASE IRRIGATION ALLOCATIONS

The agricultural sector (fruit orchards dependant on irrigation) and the associated agro-industries provide the majority of employment opportunities in the area (Table 5.19).

**Table 4.1: Labour Force per sector, 2001**

Industry	Greater Giyani	Greater Letaba	Greater Tzaneen	Ba- Phalaborwa	Maruleng	Mopani District
Agriculture	1797	10798	19321	3286	6077	41279
Mining	233	55	804	5977	131	7200
Manufacturing	640	1371	7741	2653	465	12870

Industry	Greater Giyani	Greater Letaba	Greater Tzaneen	Ba-Phalaborwa	Maruleng	Mopani District
Electricity and water	357	299	471	264	78	1469
Construction	1350	1315	2771	1673	572	7681
Wholesale and retail trade	2950	4632	8547	3433	1194	20756
Transport and communication	620	742	1669	765	1117	4913
Financial and business services	1208	819	3018	1695	435	7175
Community, social and personal services	8042	4583	10686	5702	2579	31592
Private Households	1905	1522	5174	2592	1153	12346
Undetermined	1799	1336	5069	2666	1087	11957
Not applicable	108324	93255	157167	52385	38431	449562
TOTAL	129225	120727	222438	83091	53319	608800

Source: Census 2001

Competition for the limited jobs is fierce and unemployment in the area is high (**Table 5.18**) and many people rely on income from family members working in the cities.

**Table 4.2: Percentage distribution of employment status, 1996 and 2001**

Local Area	Employed		Unemployed		Not Working/Other	
	1996	2001	1996	2001	1996	2001
Greater Giyani	9.2%	16.2%	9.5%	24.7%	81.4%	59.1%
Greater Letaba	9.0%	22.7%	8.9%	16.6%	82.1%	60.7%
Greater Tzaneen	16.3%	29.4%	9.5%	21.7%	74.3%	49.0%
Ba-Phalaborwa	24.5%	36.9%	10.1%	25.0%	65.4%	38.1%
Maruleng	12.8%	27.9%	9.4%	18.7%	77.8%	53.4%
MOPANI DISTRICT	14%	26%	9%	21%	77%	52%

Source: Census 1996, 2001

Decreasing allocations to the irrigation sector is therefore not recommended.

#### **4.6 WATER LOSS MANAGEMENT: DOMESTIC AND INDUSTRIAL**

Effective management systems to counter water loss can most certainly contribute to the increased availability of water. Maintenance tasks such repairs of pipelines can be carried out as part of a comprehensive management system. Estimates, however, indicate that even with optimistic projections, these actions alone will not provide sufficient water to meet the requirements.

#### **4.7 CREATE ADDITIONAL STORAGE**

The objective of creating additional storage (in the form of a dam) is for more effective water management in the catchment. The pre-feasibility investigations found that further resource development in the river system was still an option. The following alternative sites for additional storage were investigated (**Figure 4.1**):

- The raising of the Tzaneen Dam Wall;
- Constructing a storage dams at other sites, like Hobson's Choice in the Letsitele River; and
- the Nwamitwa Dam.

##### **4.7.1 Raising of the Tzaneen Dam Wall**

It was proposed to increase the capacity of Tzaneen Dam to approximately 203 million m<sup>3</sup> by raising the wall. This could increase the firm yield of the dam by about 6% from 60 million m<sup>3</sup>/a to 64 million m<sup>3</sup>/a, but more importantly, the dam could then be operated to minimize the frequency and intensity of restrictions on water allocations for the irrigation of permanent fruit orchards. This is a cost-effective alternative that is being investigated further in the post feasibility bridging studies.

#### **4.7.2 Constructing a storage dam at Hobson's' Choice in the Letsitele River**

The construction of a storage dam at Hobson's' Choice in the Letsitele River was investigated but was also not found to be economically viable. This option will therefore not be investigated any further.

#### **4.7.3 Constructing a storage dam at Nwamitwa**

The construction of a storage dam at Nwamitwa was investigated but was found to be reasonable (but not good). This would need to be considered together with improved water management interventions.

### **4.8 IMPROVE WATER MANAGEMENT IN ALL USER SECTORS**

Although water made available as a result of conservation and demand management strategies and recycling cannot on their own meet the projected requirements, they should and will be implemented in conjunction with the infrastructure development project.