

**Department of Water Affairs and Forestry**  
Republic of South Africa

**State of the Mhlathuze Catchment (Output 5)**

**Describe the Existing Socio-economic Situation in the Initial Pilot  
Catchment.**

**WFSP/WRM/CON2003**

**ACTIVITY 2.2**

**DRAFT**  
**10 August 2004**

**Table Of Contents**

1. Background..... 4

2. Socio- Economic Overview of the Mhlathuze System ..... 5

    2. 1. Population ..... 6

    2.2 Domestic Water Provision ..... 7

    2.3 Distribution of Water for Economic Gain ..... 8

    2.4 Small Scale Irrigation in the Catchment ..... 10

    2.5 Future Development Potential for Small Scale Irrigation..... 11

3. Overview of Economic Returns from water used in the Mhlathuze Catchment 14

4. Description of the Aquatic Ecosystems in the Catchment ..... 15

5. Conclusion ..... 18

## 1. Background

South Africa is a relatively water poor country, and in many areas the demand for water is greater than can be supplied . These areas are generally known as “stressed” catchments. In these catchments the Department of Water Affairs and Forestry may decide start a process known as “compulsory licensing”.

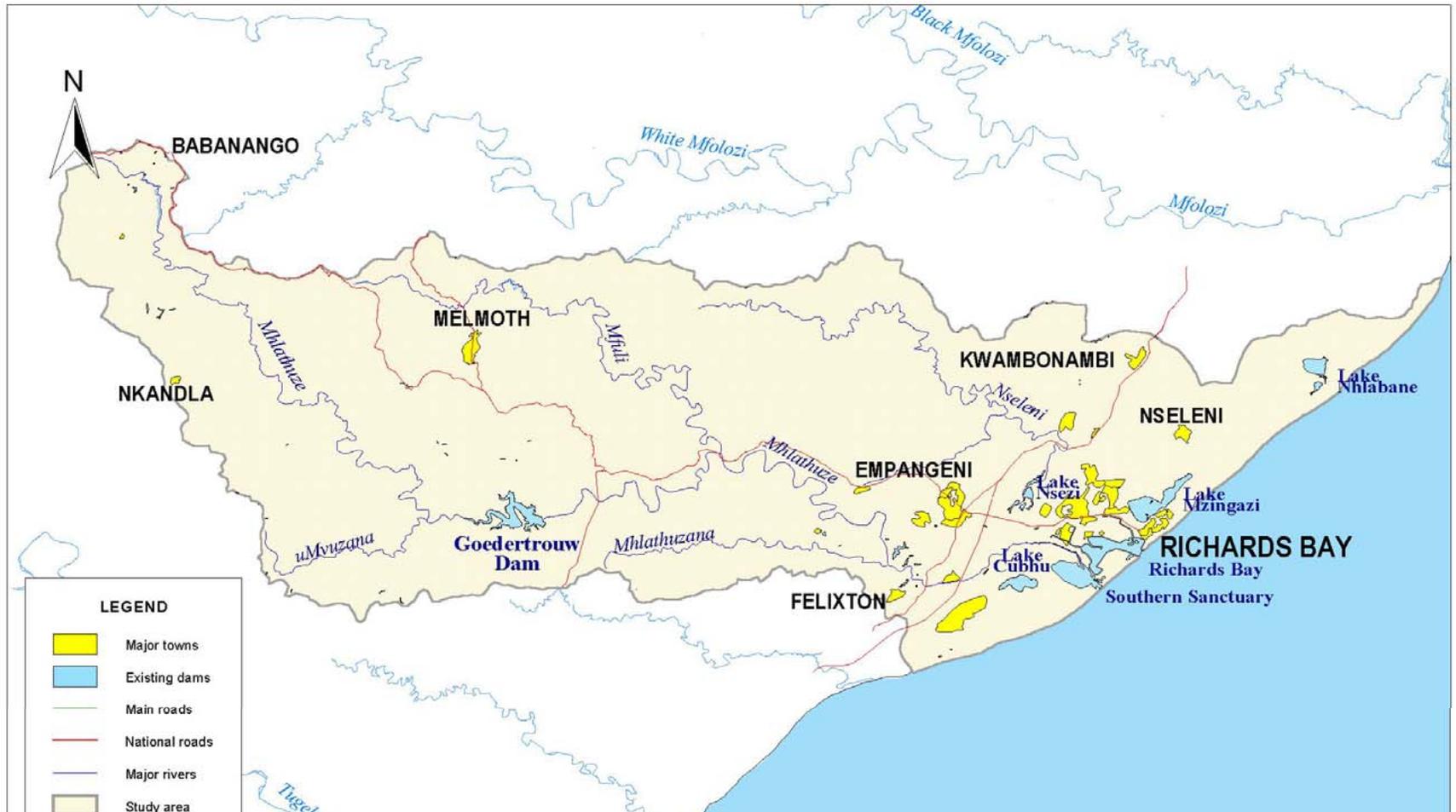
Compulsory licensing allows for the all the water use in the catchment to be re-examined, and water may be re-allocated in a manner that is fair to all. This process must promote;:

- Race and gender equity in water allocations
- economic growth and job creation
- Equitable access to the benefits of water use
- social stability
- Investor confidence
- sustainable use of water resources
- efficient and non-wasteful use of water

### Description of the catchment

The Mhlathuze catchment is being considered as one of the first compulsory licensing areas. The area that would be included in the compulsory licensing exercise comprises the Mhlathuze River Catchment along with the several smaller coastal catchments lying both to the north and south of the Mhlathuze River mouth, as well as those areas outside the catchment which are dependant on water from the Mhlathuze system (See Figure 1).

The Mhlathuze catchment is 4 209 km<sup>2</sup> in size and has three major towns namely, Richards Bay, Empangeni and Melmoth.



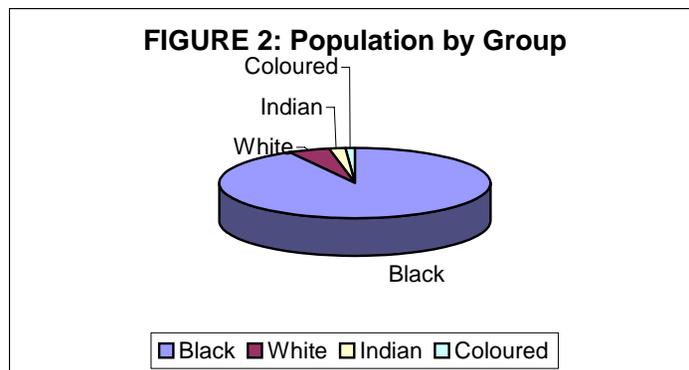
**FIGURE 1: Mhlathuze Catchment**

## 2. A Socio- Economic Overview of the Mhlathuze System

### 2. 1. Population

The Mhlathuze River system supplies water to the urban domestic, industrial and mining sectors situated in and around the towns of Richards Bay and Empangeni as well as the agricultural sector, irrigating mainly sugarcane and citrus trees. Recent studies have indicated that the water allocations as registered on the Department of Water Affairs and Forestry's WARMS system are potentially greater than the water available. There are several dangers associated with this, which will impact on everyone living in the area. In the first place there is an increasing risk of water restrictions. Secondly, the lack of water may become a problem for economic development in the area. Lastly, aquatic ecosystems may not get the water they require to function effectively, which could impact on the ability of these systems to cope with pollution.

A number of studies have examined the socio-economic conditions of the catchment. Most notably the Mhlathuze Strategic Environmental Assessment<sup>1</sup> examined the water use in the catchment in some detail. The Mhlathuze ISP<sup>2</sup>, although concerned with the uSuthu-Mhlathuze WMA as a whole, also gives some details relevant to the Mhlathuze catchment on its own.



From a socio-economic perspective the Catchment can be divided up into a number of areas. There is the Richards Bay metro area that includes the former “white” town of Richards Bay as well as the former townships of Esikhawini, Vulindlela and Nseleni. The Empangeni metropolitan area includes the former “white” town of Empangeni and the former township of Ngwelezane. Smaller built-up areas in the catchment are Nkandla village and KwaMbonambi. The remainder of the populated area of the catchment consists of rural areas. The rural areas can be divided into the commercial farming area (predominately “white”) and subsistence farming areas (predominantly “black”).

Population estimates for the catchment vary, however a reasonable figure is probably around 525 000 people with slightly over half of these people living in rural

<sup>1</sup> Steyl, I., Versfeld, D.B. & Nelson, P.J. (2000). **Strategic environment assessment for water use. Mhlathuze catchment – KZN.** Report number SEA 01/2000. Department of Water Affairs and Forestry, Pretoria, RSA

<sup>2</sup> Department of Water Affairs and Forestry, South Africa. (2003). **Development of Internal Strategic Perspectives: Usutu to Mhlathuze Water Management Area (WMA 6) – Version 1.1** (May 2003) prepared by Tlou & Matji (Pty) Ltd.<sup>2</sup>

areas. The black population makes up 92% of this. The total white population of the catchment stands at 5% while the remainder of the population is Indian and coloured.

The age distribution figures of the 2001 census show typical characteristics of a developing area with 51.3% of the total population being below 20 years of age, in other words the largest portion of the population falls in the age group that is considered not to be economically active. There is a distinct difference in the age distribution between urban and rural residents with the urban population having a larger portion over the age of twenty, and therefore more economically active people, than the rural population.

According to the SEA the Mhlathuze catchment's unemployment figure of 42.8% is higher than that of the average of KwaZulu Natal, (39.1%) However, the percentage of professionals in the catchment is 13.9% of the population compared to the overall KwaZulu Natal figure of 11.5%. This is indicative of the contrasting characteristics of the Mhlathuze catchment area. The lower part of the catchment, where Richards Bay and Empangeni are situated, is highly productive hosting some of the country's largest industries, while the upper part is typical of rural South Africa with subsistence farmers struggling to make a living with inadequate resources.

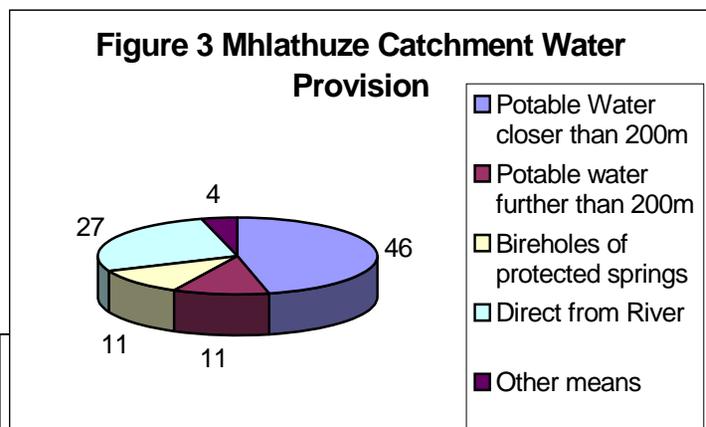
This reflects major differences between the social circumstances of the urban and rural residents of the catchment, with the majority of the population in rural areas depending on subsistence or livestock farming t.

	<p style="text-align: center;"><b>What Does this mean?</b></p> <p>There is some dispute about the size of the population but the best estimate is that there are about 525 000 people of whom more than half are people living in rural areas. People in the rural areas are generally poorer than those in urban areas</p>
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## 2.2 Domestic Water Provision

Water service provision information shows that there are some differences between the five local municipalities within the catchment boundaries. To a large extent the differences mirror the degree to which the municipalities are urbanised. For example the Mhlathuze municipality, with 55% of the population in the catchment, is highly urbanised and some 77% of the population have potable water delivered to within 200m of their homestead. By contrast, in the more rural Nkandla and Mtonjaneni municipalities almost 50% of the population rely on run-of-river or pools of

water. This situation will be addressed as part of the rollout of water services to all South Africans, however this may also have some impact on water availability in the area.



Overall it is estimated that 46% of households in the catchment have potable water delivered to within 200m of their homestead. Some 11% have access to potable water delivered a distance greater than 200m, while 11% rely on boreholes or springs or rain water tanks. An estimated 27% rely on run-of-river or dams/pools. The remaining 4% get their water from vendors or other sources. This is illustrated in Figure 3. From the above it is evident that more than 50% of the total catchment population have water inside their dwelling or inside their yard and almost 60% have piped water to within 200m of their dwelling.

However, only 55.2% of "black" people have water within 200m of their dwelling.

**What does this mean?**

Water access is improving but there is still a problem in some of the rural areas.

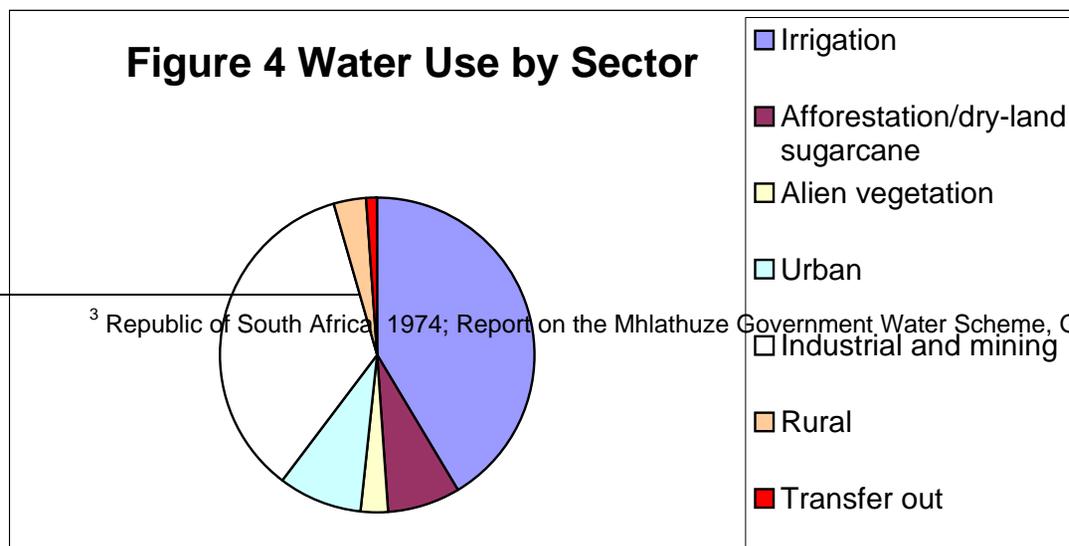
**2.3 Distribution of Water for Economic Gain**

Estimates are that rural communities are allocated approximately 3 million m<sup>3</sup> of water out of a total of the total of 270 million m<sup>3</sup> available in the Mhlathuze catchment. However, these communities probably use much less, mostly due to poor water accessibility in the rural areas, which indicates a considerable inequity in water use. However this may not include the 10 million m<sup>3</sup> provided to establish small scale irrigation users in the catchment (see below).

The major water users in the WMA are the irrigation and mining/industrial sectors, making up an estimated 50% and 23% of the total water use in this catchment respectively. Table 1 summarises the current (year 2000) water use in the Mhlathuze catchment estimated from the WARMS system. However that the actual water use may be considerably less than the allocated water.

Table 1 Major water users/requirements in the Mhlathuze River catchment	
User sector	Water requirement(million m <sup>3</sup> /annum)
Irrigation	100
Afforestation/dry-land sugarcane	18
Alien vegetation	7
Urban	21
Industrial and mining	85
Rural	8 <sup>(</sup>
Transfer out	3
<b>TOTAL</b>	<b>242</b>

Why is the table volume 242 and the text 270??



The 1974 White Paper<sup>3</sup> that prepared the way for the implementation of the then proposed Goedertrouw Dam set aside 2000ha (out of a scheduled 13 706ha) for what was then termed the “Bantu Reservations”. As such approximately 14.6% of the irrigation water

to be supplied from Goedertrouw Dam was to be used for what was seen to be small-scale farmers. Currently only half of this allocation has been developed (937ha). The reasons why the balance of approximately 1 078ha has not been developed is explored in more detail, below.

#### **2.4 Small Scale Irrigation in the Catchment**

At present there are five irrigation entities (currently termed boards but scheduled to be transformed into water user associations) that utilise and facilitate the distribution and use of water below Goedertrouw Dam. These are predominately for sugar cane irrigation although there are some irrigated citrus farms. The irrigator schemes are listed in order of distance from the dam.

- Nkwaleni Scheme
- Umfuli
- Heatonville
- Inkasa Irrigators
- UVS/Lower Mthlatuze Scheme (furthest from the dam)

Of these the Inkasa Irrigation Scheme is the only scheme that is predominately made up of small scale irrigators from previously disadvantaged communities. It is almost exclusively given over to sugar cane irrigation. Tongaat-Hulett and a variety of other role players have jointly developed the Inkasa project. For the Inkasa project three areas have been developed. These are:

- Biyela
- Kwadlama
- Mzimela

Of the three areas that have been developed both the Biyela and the Kwadlama district have been very successful and generate a profit for the growers. Both regions have good soils, but are reasonably dry and therefore are heavily reliant on the irrigation supplied. Both areas produce between 80 and 90 tons/ha/annum. For the 2003 growing season farmers made a profit of about R40 per ton or R3600 per ha. Interviews in the area suggest that the Mzimela scheme appears to have been somewhat more problematic. Although the Mzimela region is characterised by good soils and a generally efficient irrigation system resulting in yields of up to 86 tons per ha, rainfall only averages around 750mm per annum so irrigation is essential for sugar cane production. Factors that have impacted negatively on the scheme and could compromise the long term success of this project include the following:

- **Drought:** In 1995 the entire region was hit by a severe drought resulting in the Goedertrouw Dam levels dropping as low as 20% of capacity. This coincided with the development of the irrigation scheme and resulted in restrictions of water supply. Although the Biyela and KwaDlama schemes were also struck by the same drought they were already operational i.e. receiving an income stream and were better able to cope with the financial effects of the drought.
- **Sucrose price:** In 1999 the sugar industry was hit by a 12% drop in price on the world market. This coupled with the drought in 1995 further increased the financial burden faced by the Mzimela development.
- **Motivation:** The above factors have led to a lack of motivation on the part of the growers, potential funding organisations and compromised the viability of the project.
- **Management Problems:** Management problems led to a cash flow crisis.. Tongaat Hulett stepped in to help pay this bill and keep irrigation running.
- **Financial problems:** Essentially all the above factors have resulted in an increasing debt.
- **Local institutional problems:** The areas that have had successful agricultural development have been characterised by good communication links between the various levels of the tribal community. It has been suggested that within the Mzimela district there are some localised institutional problems.

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#### What does this mean?

Attempts to develop small scale sugar cane have met with varying success. Some schemes are relatively successful other have not been very successful. There are a number of varying reasons for this situation.

sector. Although the area is promising some of the problems faced by this region includes the following:

- **Road Infrastructure:** There is existing infrastructure, roads etc, but a short road section of 6km would require some upgrading. This cost has to be factored into feasibility investigations.
- **Electricity:** The existing power supply is suitable for household use but would have to be upgraded to accommodate pump stations.
- **Financial:** The main problem associated with the development of this scheme appears to lie with the issue of financing. The total capital requirements of this scheme in 2001 were in the region of R10.7million (projected to 2003 this would be about R13million). The major problem with raising the capital is that the Felixton sugar mill is approaching capacity. Future development may therefore be constrained by the fact that there is nowhere to send their sugar cane and funding in the form of grants from Tongaat-Hulett may not be provided.

Furthermore three other schemes are planned but have not been developed for irrigation and, it appears, are unlikely to be developed in the near future. These are:

- The Ngwelezane region
- The Macekane district
- The Mambuka region

There is some concern that this development has not taken place, the major constraints to this development appear to be

- **Financing:** The major constraints facing present and future development appear to involve access to adequate financing. The recent market, social and climatic conditions appear to result in financiers lacking faith in the success of the kinds of small scale irrigation developments.
- **Interest rates:** Allied to the financing problems is risk associated with high interest rate. The recent spate of high interest rates appears to have had a very negative impact on the ability of small scale farmers to succeed
- **Sugar Price:** In recent years the sugar price has been volatile.
- **Market outlet:** Given that transport costs are critical to the profitability of sugar cane the Felixton mill provides the only viable outlet for the cane produced by small scale growers. The fact that Felixton Mill is nearing capacity means that market security is not ensured. Without market security financiers are unlikely to make money available even to commercial farmers.
- **Mono crop development:** At present most development has focused on irrigated sugar cane. With market conditions not favouring the expansion of sugar cane the pre-cursors for development seem to have evaporated all together. However, under favourable conditions sugar cane is ideal for irrigation projects as the support base that could be provided to small-scale farmers is formidable. Ventures into other forms of irrigated agriculture may therefore hold management risks that would be difficult to deal with in the context of small-scale farmers. It is also recognised that irrigation start up is expensive and without a guaranteed support base financiers tend to shy away from these projects
- **Management complexity and returns from small scale irrigation projects** The management of irrigation projects is complex, and of small scale projects particularly challenging. In this regard economies of scale play a large role in determining viability from a project management input. Projects that have low returns but high management input tend to dissuade people with good entrepreneurial skills from entering the sector. Small scale irrigation projects tend to fall into this type. At present the Biyela and KwaDlamba schemes are successful because Tongaat Hulett's picks up the management overheads.. Where management is devolved to a lower level the rate of returns means that community members with the requisite skills either grow their own enterprise (and in so doing reduce the numbers of people involved in the scheme) or exit the project for something that is more lucrative.

It is, therefore, evident that access to water is not likely to be the limiting factor in using water as a vehicle for poverty alleviation in the catchment. An amount of some 13million m<sup>3</sup> could still be used for small-scale irrigation development. Rather, it appears as if structural conditions restrict the further development of the sector. In the main these problems are related to currently unfavourable market conditions although issues specific to development of small-scale irrigation within the context of traditional tenure also play a role.

Interviews in the region also indicate that although there is an awareness of the problems there is not necessarily a co-ordinated vision for their resolution. In particular the issues that will have to be dealt with appear to be the following:

**Development of small scale irrigation as a priority:** Usage of water for small scale irrigation does not appear to be a major priority within the District Municipalities. The uThungulu DM has commissioned a study entitled “The uThungulu District Municipality Agricultural Development Plan: 2003”. This plan identifies the expansion of agricultural opportunities into the previously disadvantaged sectors as a priority.. The plan also makes provision for the establishment of a Local Economic Development (LED) desk dedicated to agricultural development in the area. It is envisaged that this would be established in 2004. This provides a significant opportunity to develop a “champion” within the district.

**The Sugar Cane Focus:** Within the current development trajectory it appears as if potential expansion of small scale sugar cane irrigation is limited. Although financial support from governmental sources might solve some of the problems with capital realisation the notion as to whether this is sensible and sustainable use of the water resource would need to be examined in more detail. In this regard the LED desk should be encouraged to examine other aspects of small-scale irrigation. The “uThungulu District Municipality Agricultural Development Plan: 2003” identifies a number of alternative options for the region that might be viable. These include:

- Cut Flowers
- Paprika
- Organic Sugar
- Bio-Diesel
- Tea Estates
- Essential Oils
- Assorted Vegetables

**Land Reform:** Expansion of irrigation to the previously disadvantaged sectors is tied up with the land reform programme. Although there appears to be no immediate plans to acquire farms in the existing commercial irrigation schemes for re-distribution there may be instances where some of these farms are purchased and then made over to communities. In this regard there could be scope for expansion of existing irrigation to make use of the water available to the small-scale sector. A word of caution needs to be expressed here however. Farms set up for commercial irrigation are not necessarily easily or cost effectively transformed into small-scale irrigation projects.

**Other development initiatives:** Although the available water has been made available for irrigation purposes there is no reason why this could not be used for other purposes. Indeed the precedent has been set. Of the 2000ha envisaged for small-scale irrigation 100ha has already been “swapped” for a 1000ha of community-based forestry. Other initiatives could be explored.

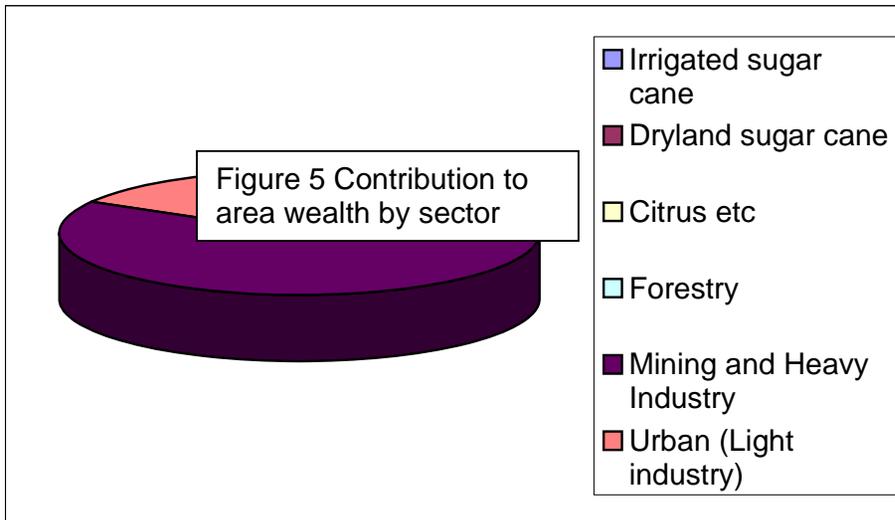


**What does this mean?**

Although there is water and some potential to further develop small scale irrigated agriculture there are a series of factors that make these types of projects potentially non-sustainable, other alternatives for the water available for small scale agriculture need to be investigated

**3. Overview of Economic Returns from water used in the Mhlathuze Catchment**

- The following sectors were examined with respect to their likely contribution to the local economy Agriculture: Irrigated Sugar Cane production  
 Irrigated citrus and other crops  
 Dryland Sugar Cane production
- Afforestation

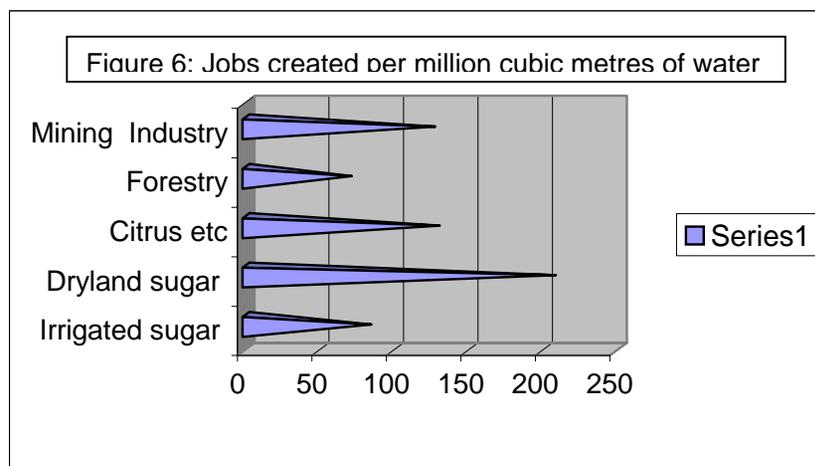


- Bulk Water Users (Mining and Heavy Industry)
- Urban Requirement:
- Light Industry

Each of these sectors was assessed in terms of how much money they earn for the area, their water use and how many jobs they create. However, practicalities dictated that this had to be calculated at the “farm gate”, and did not account for downstream knock on benefits.

Figure 5 shows that most of the income earned in the Catchment comes from mining and heavy industry followed by the urban and light industrial sectors. Agriculture and forestry produce relatively small parts of the wealth. (Note this does not include the income and employment at the Felixton Mill or by Pulp and Paper processing. However an analysis of the employment generated by unit of water used shows a slightly different picture. Figure 6 shows that when the light industrial and urban sector is excluded from considerations of employment (as it is not water dependent) then the agricultural sector features as a relatively more efficient user of water.

It should also be borne in mind that the agricultural sector often employs the lowest skilled workers. It also provides employment into the rural area.



although mining and heavy industries are relatively large users of water, and play a very important role in the economic scene of the region, light industries make a larger proportional contribution as far as Value Added and Employment is concerned when measured against per volume water used.



**What does t**

Agriculture does not seem to perform as well as mo water used. However its role as an employer of pe region should not be underestimated.

4.

## **Description of the Aquatic Ecosystems in the Catchment**

Provision of water to sustain aquatic ecosystems (the ecological reserve) is central to the management of water resources in South Africa. Ecological functioning is necessary for the health of the river and lakes as environments but is also important for the people who rely on the services provided by the river and its lakes. In the context of the Mhlathuze system with a large and relatively poor rural population there are many people who rely on a healthy rivers and lakes to survive.

During 1998 a comprehensive Ecological Reserve Study was undertaken for the following systems:

- Mhlathuze River downstream of Lake Phobane.
- Mhlathuze Estuary.
- Nhlabane Estuary.
- Cubhu, Mzingazi, Nhlabane, Mangeza and Nsezi Lakes.

In addition during 2002 a Reserve study was initiated for the Mhlathuze River upstream of Goedertrouw Dam

This section of the report summarises the state of the aquatic ecosystem and provide the reasons for the present ecological state (PES) of the aquatic ecosystem.

The study shows that the PES in the Mhlathuze River system varies from a slightly modified (describe these – most readers will not be familiar with the categories) downstream of Goedertrouw Dam to a completely modified system downstream of the Mhlathuze Weir. Problems are largely due to the influences of human activity in the area. However, problems due to a lack of water also play a role. The principal causal factors that are responsible for the modification in condition of the ecological components are primarily attributed to:

- Grazing, trampling and local disturbances in the tributaries.
- Alien vegetation in all areas - also vegetation removal.
- Construction activities upstream of the Goedertrouw Dam.
- Changes in flow and present operation downstream of the Dam.
- Sand mining.

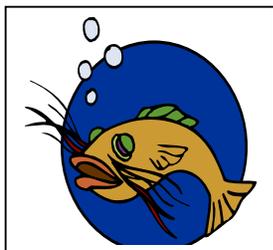
Human based impacts on the Mhlathuze River (other than flow related) can best be addressed through improved agricultural management in the catchment, policing of subsistence fishers and the establishment of weirs with appropriate fish ladders.

The Mhlathuze Estuary is moderately modified. The principal reasons for this also do not relate to the availability of water. Influences such as human disturbance, over-fishing and removal of wetlands for agriculture are the primary reasons for changes to each of the ecological components. Several of the major changes to the ecological components include:

- Loss of botanical, aquatic invertebrate and fish species associated with a freshwater-marine mixing zone and poaching in other marine-dominated areas of the system
- Decreased productivity of planktonic biota due to poor water quality
- Change in dominance of functional groups of aquatic invertebrates with increased salinity
- As the Nhlabane Estuary has also been extensively modified from the pristine state. In this case reduced inflows may be a primary cause of degradation, along with pressures from the surrounding rural populations.

Lakes Mzingazi, Cubhu Nsezi and Mangeza have similar causes of change and are currently degrading even further. The reasons for this are:

- Extensive loss of surrounding swamp lands and indigenous vegetation.
- Population pressures of surrounding urban and rural communities.
- Loss of connectivity to the marine environment through the Mhlathuze Estuary and even adjacent catchment river systems in some cases.
- Loss of important macro crustacean and fish species requiring obligatory movements to and from the marine environment during their lifecycles.
- Water level regulation.



#### **What does this mean?**

Aquatic ecosystems in the the Mhlathuze catchmentn have been greatly modified. Some of this modification is attributable to the construction of Goedertrouw Dam but much of the other impact is due to human pressures on the system and to some extent the increase abstraction of water. The system is degrading over time. The point is "will just adding in water be sufficient or does more need to be done"?

## **5. Conclusion**

There is still significant inequity in the use of water in the Mhlathuze Catchment. However, access to water is not the limiting factor in using water as a vehicle for poverty alleviation in the catchment, as some 13million m<sup>3</sup> could still be used for small-scale irrigation development. However, other factors restrict the further development of the sector.

In the main these problems are related to currently unfavourable market conditions although issues specific to development of small-scale irrigation within the context of traditional tenure also play a role. Although the available water has been made available for irrigation purposes there is no reason why this could not be used for other purposes.

It appears as if there is some work still to be done in terms of extending the provision of water services, particularly in the rural areas.

Further the economic analysis indicates that although agriculture does not seem to perform as well as most of the other sectors in terms of adding value to water used. its role as an employer of people and as an input into goods produced in the region should not be underestimated.

Conclusion on aquatic ecosystems – do we need to provide more water to these??