OLIFANTS RIVER BASIN: THE PROCESS OF BASIN CLOSURE

Washington Nyabeze [*], Bekithemba Gumbo and David Love
WaterNet, PO Box MP600, Mount Pleasant, Harare, Zimbabwe

The Olifants River Basin is to the north-east of South Africa. This basin is formed by the Olifants River and its tributaries. The Olifants river flows from southwest to northeast and joins the Limpopo River in Mozambique on its way to the Indian Ocean. The basin covers 54 000 km^2 and receives about 630 mm of rainfall per year on average, but rainfall varies considerably in space and time, and droughts occur frequently. Mean annual potential evapo-transpiration is very high and effective rainfall is very low making crop production under rain-fed conditions is very risky. Irrigation is seen as a possible solution.

The Upper Olifants River catchment has five major dams. A number of new schemes have been proposed to increase the availability of reliable supplies and improve the quality of water in Olifants River such as the raising of the Flag Bashelo dam and construction of the De Hoop Dam. The development of related water supply infrastructure in the Olifants Basin is driven by domestic, irrigation, mining, industry and coal fired power stations. In the Olifants river basin agriculture is the largest water user taking about 45% of the available yield followed by the mining, power and industry (together taking about 25%) and domestic use which takes about 12%. However, there is increasing concern that some of the irrigation water needs may not reflect actual water use. The overall water balance for the Olifants basin on 1:50 year assurance shows a deficit of about160 million m^3/a. There is a problem with deteriorating quality of water especially in the Steelpoort, Selati and the Middle Olifants rivers. Contamination of groundwater is also a problem and this is caused mainly by effluent discharge into streams from towns, industries, mines and other sources.

The Olifants Basin can be divided into four zones/areas namely Upper, Middle, Steelpoort and Lower Olifants. The Upper Olifants, Middle Olifants, Steelpoort and Lower Olifants areas are in a deficit situation. The Upper Olifants area is dominated by mining activities but the largest water requirement is for thermal power stations. However these rely mainly on imported water. The Middle Olifants is dominated by domestic and irrigation requirements. The Steelpoort area is dominated by irrigation and mining activities while for the Lower Olifants area irrigation is the main user. Users in the lower Olifants River are at a disadvantage because of water use in upstream areas. One of the downstream users, the Kruger National Park is increasingly finding it difficult to obtain its share of the available water resource. Water shortages are affecting the development of irrigation in the Selati River catchment. Water use in the Olifants Basin also affects availability of water in the neighbouring country of Mozambique which is further downstream. Increased mining activities are impacting on the quality and quantity of water available.

Population and economic growth are putting immense pressure on the already stressed water resources. This is in addition to the development imperatives for the basin which include the need to improve domestic water supply and sanitation and resuscitation of irrigation schemes. This paper presents the Olifants River Basin as a case of a basin that has developed from an "open" river system to one that is "closed". Competition for water is evident especially in drought conditions as users try to minimise the impacts on their activities.

Challenge Program on Water and Food (CPWF), has various research activities on the Limpopo Basin which are exploring how to produce more food with less water. A vital step towards reaching this goal is to increase the productivity of water used for agriculture, leaving more water for other users. One of the CPWF projects, generally referred to as WaterNet Challenge Project Number 17 (CP17) for

[*] Corresponding author: Tel.: +27-11-315 6791. Fax.: +27-11-805 3875. Email.: washy@makproj.co.za

Improved Rural Livelihoods Limpopo Research aims at improving livelihoods of poor small holder rural farmers through the development of an integrated water resources management (IWRM) framework for increased use of green and blue water flows and risk management for drought and dry spell irrigation at all scales in the Limpopo basin. The introduction of more ecologically sound agricultural practices and stocking rates can to halt the current degradation of the vegetation and thus improve runoff, control erosion and improve water quality

This paper presents the work being done in the Olifants Basin under the CPWF and in particular the WateNet CP17 and explores the issues around how the IWRM approaches can improve livelihood of small-holder rural farmers. On this project key research is being undertaken by two Ph.D fellows, registered at WaterNet member institutions. Each Ph.D. fellow is linked to a series of masters students, who undertake their dissertation projects within PN17. The project also involves testing of innovations with communities, capacity building at community, extension officer and water manager level.