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The Canal Closure Programme for Downstream Compensation Flows: Is it Working?

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Abstract

A dry season irrigation canal closure programme was initiated in the dry season of the cropping year 1999/2000 by the then Usangu Water Management; Committee (UWMC) in order to restore dry season flows of the Great Ruaha River to acceptable levels.

This paper presents preliminary results of the monitoring of the canal closure programme currently being implemented by large irrigation schemes in the Usangu basin, which are Kapunga, Mbarali, and Madibira. The paper discusses the rationale and objectives of the canal closure programme; the methodology used to monitor it; the performance of the programme and its effect on the livelihood of people living in nearby Villages. The paper concludes that although it seems that the canal closure programmes has reduced the number of zero flow days as observed at Nyaluhanga gauging station. more time and an in-depth hydrological study is required to ascertain the same.

1.0 Introduction

The Great Ruaha River was once a perennial river. However it has been observed that part of the Great Ruaha River, between the perennial swamp (Ihefu) and the Ruaha National Park has, since 1994, dried up each year during the dry season.

In an attempt to restore dry season flows of the Great Ruaha River to acceptable levels the then Usangu Water Management Committee (UWMC) initiated a dry season irrigation canal closure programme in the dry season of the cropping year 1999/2000. The UWMC was made up of managers from all large irrigation schemes in the basin- which are Kapunga Mbarali and Madibira. The schemes are implementing this programme since July 2001.

2.0 The rationale and objectives of the canal closure programme

Irrigated areas in Usangu are reported to be about 45,000 ha. Of this the large schemes cover about 25% while smallholder irrigation farmers own the rest. It can therefore be said that the canal closure programme is implemented only in the 25% of the irrigated areas. While the major objective of the programme was to save water for the downstream requirement during the dry season, on the other hand

there was a feeling that the large schemes were taking too much water during this period. It was therefore agreed that, all canals for the large scheme be closed by the end of June each year and of course opened gradually by November for establishment of paddy nurseries.

The agreement went on by stressing the allowed quantity of water to be abstracted for domestic uses in these schemes. A maximum of about one cumec was allowed for abstraction by each scheme for domestic purposes. However, Mbarali Rice Project was allowed to take a maximum of one and a half cumec due to the fact that the farm is also engaged in livestock keeping.

The institution, which was given the responsibility to supervise and monitor the implementation of the programme, was the Rufiji Basin Water Office with the help of District Executive Director (DED), Mbarali District. It is a legal office mandated by the government to manage water in the basin. It was therefore so perfect for such programme to be attached to that office.

3.0 Methodology

The methodology used to monitor implementation and effects of the canal closure programme involved:

- i. Spot discharge measurements in drains, main and secondary canals of large irrigation schemes; and
- ii. Monitoring of zero flow days at Nyaluhanga gauging station (located downstream of the confluence of Mbarali, Kimani and Great Ruaha River) of the Great Ruaha River; and
- iii. Monitoring of canals and drains that supply water to the intended beneficiaries.

Madibira Smallholder irrigation scheme is not included in this monitoring report because:

- (a) Ndembera River, which supplies water to Madibira Smallholder irrigation scheme does not join the Great Ruaha River. Instead it pours its water directly into the perennial swamp (Ihefu). So it has no contribution to the flows measured at Nyaluhanga gauging station and,
- (b) Previous monitoring and spot discharge measurements had shown that even before the introduction of the canal closure programme, Madibira scheme was not abstracting any water during the dry season, save for a small amount diverted from Ndembera River to provide water for livestock keepers in nearby villages.

4.0 Results

4.1 Performance of the canal closure programme

Monitoring of the canal closure programme has revealed that during most of the time Kapunga and Mbarali irrigation schemes are actually abstracting less than what they have been allocated. The only exception is during late October and November when a lot more water is abstracted for establishment of paddy nurseries.

4.2 Compensation flows downstream of Nyaluhanga gauging station

Effects of canal closure programme on downstream compensation flows can best be assessed by comparing discharges as recorded at Nyaluhanga gauging station prior to and after the introduction of the canal closure programme. However due to the absence of a reliable rating curve (the two nearby stations were established after late 1998) this is not feasible. So the assessment was only based on observation of the start and (where possible duration) of zero flow days. In 1999 the river dried up on 24th October (SMUWC records) and by the end of December of that year the river was still dry. This year the river dried up on 22/11/2003 and the flow resumed on 1/12/03. When measured on 4/12/03 the flow amounted to 0.180 m³/s. When the gauge reader and local people leaving in nearby villages were interviewed on this year's flow as compared to previous years, they all ascertained that by November 2002 the river had already dried up. The same could be said for the previous years.

5.0 Effects of the closure programme on the livelihood of rural people

Villagers leaving near Kapunga and around Ifushiro swamp are claiming that the canal closure programme has affected their livelihood because too much water now goes to the Ifushiro swamp thereby making it difficult for them to undertake their bread-earning activities. Fish catches (predominantly cat fish) have diminished because of too much water at the center of the swamp; valley bottom farming and flood recession agriculture has to be undertaken late in the season because of inundated water; and livestock are unable to graze around much of the swampy area.

There are no claims that the canal closure Programme has increased weeding load, as there is no sufficient water to suppress the weeds prior to paddy transplanting. Furthermore because of now a shorter period for growing paddy, there is stiff competition for hired labour thereby increasing the costs of paddy production.

6.0 Conclusion

It can be concluded that although it seems that the canal closure programme has reduced the number of zero flow days, it has also impacted negatively on the livelihood of some of the rural poor.

7.0 Recommendations

- 7.1 It is recommended that more time and an in-depth hydrological study be undertaken to ascertain the long-term effects of the canal closure programme.
- 7.2 Efforts should be increased to bring on board the smallholder farmers who cultivate the remaining 75 of the paddy producing area. First priority should be given to farmers from the remaining perennial rivers.