

Shire Valley Transformation Programme (SVTP-1)

‘Irrigation Service Provision’



43,370 hectares
targeted for irrigation farming



50 cumecs
peak water requirement



World Bank US\$160 million
African Development Fund US\$ 50 million
GEF US\$ 5.6 million
Malawi Government US\$7.2 million

The Irrigation Service Provision component (Component 1) will finance the works, goods and services necessary to develop bulk irrigation and drainage infrastructure in the SVTP-1 area (Chikwawa and Nsanje Districts).

Provisions of the Component:

- Preparation of detailed designs and construction supervision and quality assurance;
- Construction of the physical bulk water conveyance and main distribution system;
- Major drainage and service and access roads;
- Establishment of a professional management, operation and maintenance system for the Shire Valley Scheme.

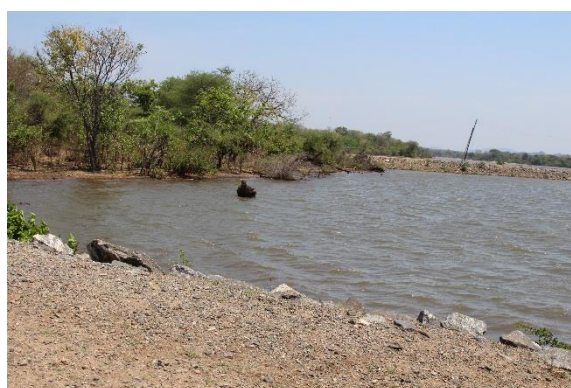
Major Irrigation Scheme Infrastructure:

Major works to be constructed will include the Intake, Main and secondary canals, emergency spillways, an invasive fish barrier, cross and head regulators, inverted siphons, sediment basins/ejectors, night storage reservoirs, wildlife and other crossings and bridges, a road network and a water supply system for Chikwawa Township among others. All hydraulic structures have been designed to accommodate the peak design discharges requirements for both Phase 1 and 2 project areas.

a. Water Intake

The intake is the starting point of the irrigation scheme. It is located at the Kapichira Dam and is designed to serve both Phase 1 and 2 of the SVTP. It has been designed to abstract the maximum water demand of 50 cumecs which is enough for both Phase 1 and 2. The abstraction sill level of (143.5 m.a.m.s.l) is well positioned to ensure abstraction of the required irrigation water at all

times and in a way that will not interfere with flushing and operations of the hydro power station.



Site of the SVTP Intake at Kapichira Dam

The Intake comprises of 12 sluice gates, each 3m wide, and is divided into two portions, with one portion composed of 8 gates, and another 4 gates. This will translate into a maximum flow rates into each partition of 32 and 18 cumecs respectively. Operation of the gates will depend on water demand from the scheme.



In case large amounts is needed, both sections will be used. In any case, for phase 1 operation, only one partition will be used. This partitioning arrangement is also applied to the siphons so that the flow rate in the siphons is maintained above 1.0m/s even with low flow rates so as to minimize sedimentation.



Sluice gates like these will be constructed at the Intake

b. Main Canal

The Main Canal 1 stretches 33 km from Intake before it bifurcates into Main Canal 2 and 3. Main Canal 2 will supply Zone A of Phase 1 area and extend 80kms to the entire Phase 2 area while Canal 3 will supply water to other small holder farmers, outgrowers, including Illovo Estate. Major hydraulic structures on Main Canal 1 include siphons, invasive fish barrier (drop structure) bridges, culverts, sediment ejector etc. These structures have been appropriately designed using internationally recognized equations.

The Main Canal just before secondary canals starts abstracting water has a bottom width of 12.6m, top width of 19.2m and water depth of 2.2m excluding free board which is 0.8 m. This is designed to convey a maximum of 50 cumecs. However, the cross section keeps on reducing in size with subsequent withdraw of water by secondary canals.

c. Invasive fish barrier

In order to prevent invasive fish species like Tiger Fish which is found on the downstream of Kapichira Falls from migrating to Lake Malawi through a network of drains, tertiary, secondary and Main Canals, Environmental and invasive fish specialist

recommended the construction of a barrier. This barrier will be a drop structure which is high enough to prevent fish from jumping over. This structure will be made of concrete and will have a total vertical drop of 6.10 meters.

In order to exceed the leaping abilities of the tiger fish, the required height should be 3 m from the upstream bottom level of the canal up to the maximum top water level of downstream canal. However, in this design, top water level is set at 1.5 m, thus creating a 4.5 m free fall which is even higher than the recommended 3 m. The total drop of the structure is 6.3 m and an additional 1.66 m sill will be constructed at the end of upstream canal, inclining upwards.



Site of the fish barrier

d. Siphon

This is composed of double boxes which have a smaller section (3.0x3.0m) and a larger section (5.0x3.0m). The two different size passages are provided to prevent sediment settlement in the siphon by keeping the flow rate in the siphon higher than 1 m/s even at small flow rates.

Compliance with international obligations

The SVTP will be executed in the line with the following provisions:

- Zambezi Watercourse Commission (ZAMCOM) agreements;
- 2000 Revised SADC protocol on Shared Watercourses;
- Integrated Water Resources Management (IWRM) plans of individual riparian and SADC nations.

For more information, visit the website: www.svtp.gov.mw

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