

Katie Wilkinson Scholarship Report

The Management of Water Resources in the Ruaha Basin, Tanzania

by Lindsey Jones

Allocation of water for use in Sub-Saharan Africa is often a source of conflict, as a range of stakeholders compete for a finite supply of the resource. One such area that exemplifies competition over water is in the Ruaha basin in Southern Tanzania where agriculture, industry and the environment each seek to obtain their required quota in order to fully satisfy their needs. The situation is further made difficult as the Great Ruaha River (Figure 1) has seen a steady decline in water levels in recent times, highlighted when for a period of two weeks in 1993 the river dried out completely for the first time in living memory. Furthermore, since 1999 the river has consistently dried up for a period of over 100 days, with wet seasons currently under threat. The Great Ruaha forms at the base of the Usangu wetlands, a large swamp supporting a wide range of flora and fauna, highlighted by an exceptional bird population comprising of a species diversity of more than twice that of the entire European continent. The area is considered the hub of Tanzania's rice production with a number of rice schemes scattered across the basin.



Figure 1: Lindsey Jones looking over the Great Ruaha River, taken during fieldwork to collect information on water levels

Further downstream, the river flows through the Ruaha National Park, soon to be the largest national park in Africa, covering an area of 15000 sq km, and boasting the largest population of elephants in East Africa. Finally, the river discharges into the Mtera reservoir (Figure 2), a regulation dam supplying both the Mtera and Kidatu hydropower generators, which between them generate up to 55% of Tanzania's electricity supply. Evidently the fall in water levels and consistent dry season shortages has had dramatic effects on all who rely on the river as a lifeline. A number

of viable solutions have been proposed to attempt to alleviate the problem with the construction of a small multipurpose dam upstream of the Great Ruaha deemed to be the most feasible option. The dam will act to regulate the flow of water, storing excess water during the wet season whilst releasing it during the dry season, meaning that perennial flow of the Great Ruaha would be achieved. As of yet the environmental and socio-economic impacts the proposed dam would have on the surrounding area are not know.



Figure 2: Lindsey Jones with a worker from the Rufiji Basin Water Office on a trip to the Mtera dam, where he interviewed the director and collected information about the reservoir.

A six week research project was undertaken based at the Rufiji Basin Water Office in Iringa, Tanzania, to investigate the various effects the dam would have on the basin as well as examine the benefits and losses to each of the main stakeholders involved with the dam's construction. Most importantly however, the report focuses on whether in fact its construction would return perennial flow to the Great Ruaha River. Various scenarios are run in an attempt to identify one that will impact positively on all stakeholders involved with the dam's construction. Through assessing the dam's impacts, the report establishes a suitable scenario looking to best fit the interests of all users involved. In order to achieve this, the Rufiji Basin Decision Aid (a computer model designed to simulate the hydrology of the river basin) coupled with a dam simulation model are used to assess the hydrological impacts the dam will have on the downstream water system. A series of interviews conducted with each of the major stakeholders involved is also used to establish the needs and effects the dams construction will have on all those involved. The research conducted suggests that it is possible to adequately suit all users through suggesting a number of scenarios that impact positively on all stakeholders, whilst simultaneously having a low impact of the surrounding environment. Furthermore, the report concludes that restoration of perennial flow to the Great Ruaha River can only be achieved by adequate regulation of water consumption, through effective integrated water resource management as well as with the implementation of widespread high efficiency irrigation.