

## Abstract

Inadequate and unreliable rainfall and the recurring threat of drought restrict the potential for agricultural development in Zimbabwe. Given the limitations posed by climate irrigation is necessary in many parts of the country. An estimated 70% of 11.6 million Zimbabweans (CSO, 2002) depend on smallholder agriculture for their livelihood and are exposed and vulnerable to hunger because of the droughts. Growth in smallholder irrigation agriculture will alleviate poverty, create jobs and raise incomes. It will enable the poorest people to move out of poverty into prosperity. Appropriate irrigation technology which brings optimum yields is necessary in such a semi- arid climate. This paper analyzes yields obtained under different irrigation technologies by smallholder farmers thereby drawing lessons on the impact of irrigation technologies from schemes that have already been constructed. In order to achieve optimum benefits it is important to assess both modern and traditional technologies and come out with the factors that make certain irrigation schemes successful and others not. Smallholder farmers in Zimbabwe can not afford the huge investment costs of irrigation projects therefore the government finances the schemes to stimulate development. Government officers select technology for the smallholder projects using their own discretion and criteria. The major question is whether the government officers should consider modern technology for smallholder irrigation schemes. Can the smallholder farmers obtain the high yields achieved by large scale commercial farmers using modern technology? To answer the question I employ ordinary least squares estimation, two stage least squares and cost- benefit analysis. The results of this study suggest that yield under modern technology for all five crops is significantly better than

traditional technology. The results also support the idea that government should consider smallholder irrigation as an option for development.

**Key words:** irrigation technology, smallholder, yield, Zimbabwe

#### Introduction

Zimbabwe is an agricultural economy which is vulnerable to shortages in water supply and the government has recognized the role of irrigation development as a key drought mitigation measure. The Zimbabwe Agricultural Policy Framework, 1995- 2020 (ZAPF) recognizes that since a majority of the population derive their livelihood from agriculture and live in rural areas, raising productivity and incomes in smallholder agriculture is both the key to long- term agricultural development and the most direct way to eradicate poverty, hunger, malnutrition and unemployment. Smallholder farmers operate in the low rainfall areas and produce mainly food crops for subsistence and a few cash crops for sale. Currently the area under irrigation is 175 000ha of which only 11% is under smallholder irrigation. The available water resources in already constructed dams can irrigate 250 000ha (Ministry of Lands, Agriculture and Water Development, 1994). Out of this potential about 90 000ha is expected to be in the smallholder irrigation sub-sector. The types of irrigation technologies in use in the smallholder irrigation sub-sector are traditional methods, such as flood or surface which comprise 68% and modern technologies such as sprinkler and drip irrigation which make up 32% of the schemes.

The responsibility for technology selection for smallholder irrigation usually lies with the non- governmental organization or government department which initiates or finances the