

Sustainable use of irrigation water in arid areas of East-Africa

Jinja Engineering Company is a small irrigation/green house company, We are based in Jinja Uganda.

Our motto 'Small Ideas, Big Revolutions'

Green houses are climate controlled. In this Green House structures crops are grown under a favorable artificially controlled environment and other conditions viz. temperature, humidity, light intensity, photo period, ventilation, soil media, disease control, irrigation,

Our Green Houses have a variety of applications, the majority being, off-season growing of vegetables, floriculture, fruit crop growing and plant breeding and variety improvement.

Abstract

The world population is increasing fast. In sub-Saharan Africa, which comprises East African countries, the current population is estimated to reach 1.2 billion by 2020.

This paper discusses the status of irrigation in arid areas of East-Africa, the potentials and challenges for irrigation, and suggests necessary points to be considered for the sustainable use of irrigation water in these areas.

1. Introduction

Arid environments are so diverse in terms of their land forms, soils, fauna and flora. As a result, strict definition encompassing all these components cannot be derived. However, all arid environments are characterized by excessive heat and inadequate, erratic precipitation (Abu-Awwad, 1998).

Based on aridity index, arid environments are divided into hyper-arid, arid, and semi-arid zones. All of these together cover about one-third of the world's land (FAO, 1989).

Annual rainfall is low and rarely exceeds 100 mm per annum. The rains are so erratic that could be no rain for many years.

2. Irrigation as a means of development

The population of sub-Saharan Africa, now nearing 600 million, is projected to double by the year 2020 (FAO, 1997). This population growth has created a big gap between the crop production and demand for food, especially in developing world. About 85% of populations in sub-Saharan Africa depend on agriculture for their livelihoods. Therefore, development in agricultural sector is crucial to achieve the intended development program in this region. Because, development in this sector contributes to poverty

reduction through intensification and diversification of farm outputs, increasing agricultural wage employment and reducing local food prices (World Bank, 2008).

3. The use of irrigation in arid regions

In subSaharan Africa, about 16 % of the population lives in semi-arid areas (World Bank, 2008), and due to inadequate and erratic rainfall, water is scarce. In these regions, the increasing human population and livestock have intensified the use of water for drinking, hygiene, and agriculture.

In arid and semi-arid regions, irrigation is believed to improve economic returns and can boost production by up to 400% (Fernández-Cirelli et al., 2009).

Thus, clearly, irrigation can play an important role in raising and stabilizing food production especially in the less developed parts of Africa residing south of the Sahara such as the regions in the Horn of Africa. There are, however, many obstacles that hinder the rapid development of irrigation in East-Africa and other sub-Saharan countries.

Estimates of irrigated areas in East-African countries in (ha):

Kenya -18.9

Tanzania -15.1

Uganda - 4.5

Source: Small-scale irrigation for arid zones: (FAO, 1997).

4. Factors affecting the sustainability of irrigation in arid zones

To be sustainable, irrigation must enable the society meet its demands for food and fiber without causing severe environmental degradation.

It is an obvious fact that application of too little water is wastage, as it fails to produce the desired benefit. It is also a wrong idea to assume that if a little of something is good, and then more must be better. In irrigation, only that amount of water needed to meet the requirements of the crop is best. Excessive application of water will raise the water table and cause water logging.

5. Water management for sustainable irrigation

The use of marginal quality waters in arid and semi-arid regions is unavoidable (Pang et al., 2010). In order to cope with the increases in salinity and sodicity, proper soil, irrigation, and crop management practices should be undertaken. When applied properly, irrigation not only boosts yield, but also minimizes wastage of water by runoff,

evaporation and excessive seepage. Traditional inappropriate use of irrigation systems such as flood irrigation leads to seepage losses and pollution of the entire field with salinity. To avoid these problems, irrigation systems such as drip emitters or micro sprayers, which help to provide the required amount of water to the root zone should be used (FAO, 1997).

Conclusions

In East-African countries, the ever increasing human population and expanding aridity accompanied with less productive land left people in short of food. This calls for well-planned sustainable irrigation development to producing food crops, but also other cash crops such as cotton and oil seeds that can perform better in high temperature and dry conditions to enable people buy foods from domestic or global market.

The End