

# TANZANIA



## 1. INTRODUCTION

### 1.1 THE COUNTRY

Tanzania lies on the East Coast of Africa between  $1^{\circ}$  and  $11^{\circ}$  S latitude and between  $29^{\circ}$  and  $40^{\circ}$  E Longitude. It is bordered by Kenya in the North and shares Lake Victoria with Kenya and Uganda in the West. Tanzania has frontiers with Rwanda, Burundi, and Democratic Republic of Congo in the Southwest, and Zambia, Malawi, and Mozambique in the South.

### 1.2 LAND

The land area of Tanzania is about 1 million square kilometres. This includes the offshore islands of Zanzibar, Pemba and Mafia.

Tanzania is dominated by the effects of plate tectonic movements, which have formed a dramatic landscape of mountains, lakes and rolling plains. To the Northwest the huge Lake Victoria Basin separates the western and eastern rift valleys and the separation is continued by the central plateau which is more than 2000m in elevation. The Northeast border with Kenya is dominated by Mt. Meru and Mt. Kilimanjaro the highest peak in Africa and associated spectacular lakes, calderas and grassland steppes.

A second mountain ranges the Southern Highlands separates the Eastern Plateau from the rest of the country. The coastal belt is an important rice growing area.

### 1.3 CLIMATE

The climate is tropical with general rainfall low and unreliable. Only few areas receive 1000 mm annually, but in average rainfall ranges between 600 - 800 mm annually. Rainfall in the north of the country is bimodal (long rains from March - May, short rains from October - December). The South regions experience a single wet season from November - April. The normal tropical temperature pattern is affected by altitude over most of the western half of the country with minimum temperature below 15o C from June to August. Light intensity is good throughout the country.

### 1.4 POPULATION

Estimates put the population figure at around 30 million at an annual growth rate of 2.8%. More than 80% of the people live in rural areas.

### 1.5 AGRICULTURE

Tanzania's economy continues to be dominated by agricultural production, which accounts more than 50% of GDP. Output remains predominantly based on smallholder production. Estate cultivation was centred on sisal, sugar, tea and to a lesser extent coffee, tobacco, rice, wheat and wattle. Traditional exports such as coffee, cotton, sisal, cashewnuts, cloves, tea and tobacco remain the pillars of export income generation.

Recently the Tanzania government has placed a great deal of emphasis on agricultural export diversification stressing the switch from traditional to non-traditional exports such as horticulture products, spices and manufactured goods.

In addition to the above switch the government of Tanzania is placing more to enhance large scale irrigation projects. These projects are vital especially when the drought effects are observed which affected key food production areas in Tanzania.

### 1.6 INDUSTRY

The Tanzania's industrial sector is still weak though remarkable gains have been observed in the production of cement, soft drinks, food processing and corrugated iron sheeting. The industrial sector contributed approximately 11% to the GDP of the nation.

## 2. IRRIGATION PERSPECTIVE IN TANZANIA

Tanzania has vast undeveloped land resources. Various estimates have indicated that the country has a potential total arable area of about 40 million hectares. Of this total figure only some 6.3 million hectares are currently under crop production, 5.2 million hectares by smallholders with the balance being farmed by parastatals and private sector concerns.

Until recently irrigation in Tanzania took place on traditional irrigation schemes, some of which are many hundred of years old. Although such schemes have worked well for countless generations, but are now inadequate due to:

- (i) sharp increases in population
- (ii) fair wear and tear
- (iii) catchment degradation and other environmental problems such as waterlogging and salinity.

The traditional schemes have therefore become increasingly inadequate in recent decades.

The response to the increasing shortcomings of the irrigation schemes from the colonial times until recently has largely been to construct expensive new schemes for the smallholder,

parastatal and private sectors. The great majority of these schemes have failed with the exception of those serving the private sector.

This approach has resulted into a gross distortion in the financing of the sector. It should be visualized that irrigation in Tanzania is still very important as it helps in achieving the following primary objective :

- (i) Satisfying subsistence requirements in many parts of the country - equals increased food security at household level.
- (ii) Generating local surpluses of main staples, particularly rice in order to achieve food security in the country.
- (iii) Ensuring the production of much need dietary supplements such as vegetable fruits and pulses.

Having seen this great importance, the sector has developed a strategy, which is a planning, and coordination framework called the National Irrigation Development Plan (NIDP). This is essentially a response to the pressing need for :

- (i) food security
- (ii) economic growth
- (iii) counter measures against the drought cycle which dominates agricultural production in Tanzania.

#### Types and Methods of Irrigation - Tanzania.

**Table 2.1.** Types of Irrigation - Tanzania

Area by Farm Type	Unit	Area
* Estates, outgrowers, medium to large commercial farms	ha	2400
* Parastatal/government farms	ha	19,700
* Smallholder, small commercial	ha	359,000
Total area under Irrigation	ha	381,000

**Table 2.2.** Methods of Irrigation - Tanzania

Area by Farm Type	Unit	Area
Formal Irrigation	ha	26,000
Traditional Irrigation	ha	85,000
Natural flooding/water Harvesting	ha	270,000
Total Present Irrigated Area	ha	381,000
Formal Irrigation methods	Surface	

## 2.1 EXISTING TYPES OF IRRIGATION SYSTEMS IN TANZANIA

### Surface Irrigation

There are a wide variety of irrigation systems used in our country. The predominant one is surface irrigation. In this system which is very common for small holders, distribution is usually by lined and unlined canals. Included in this category is the water harvesting or use of flood recession, which although informal but its still considered as surface method. Furrows and

basins are widely used in this. This system does give rise to salinity, but once attention is paid to adequate drainage, the problem is overcome.

### **Conventional Sprinkler Irrigation**

This is widely used by large scale commercial farmers. It is not common among the smallholders as these are too many mechanical parts to break or lose but also requires pumping. In Tanzania, very few schemes use this approach.

### **Drip Irrigation**

It is widely used on coffee and other crops. If well designed the system performs well. The system is rarely used in Tanzania.

## **3. PERFORMANCE OF IRRIGATION IN TANZANIA**

The development of irrigated agriculture in Tanzania has been very slow. Various reports indicate poor performance. The rate of implementation of new schemes and the operational performance of existing schemes are inadequate as visualized by the Task Force of National Agricultural Policy.

Public sector irrigation development in Tanzania has followed three different paths.

- (i) The construction of new irrigated estates for parastatal operations.
- (ii) The construction of new modern style scheme for smallholder occupation and operation
- (iii) The rehabilitation or upgrading of traditional irrigation schemes.

The overall performance in the rehabilitation has been generally good, though only few schemes have been addressed in this aspect. The rate of development of new schemes has been slow to pick up, despite the slow increase still the performance is below expectations. Among the reasons for this minimal performance are :

- (i) absence of vital irrigation data for planning purposes
- (ii) lack of resources on the part of the government e.g. funds and trained irrigation personnel.
- (iii) absence of national irrigation investment criteria
- (iv) lack of a national coordination for irrigation development despite available funding from donor agencies and NGOs.

### **3.1 OPERATIONAL PERFORMANCE**

In theory all public sector irrigation scheme have been constructed mainly for the purpose of producing crops in order to meet the National food consumption demand.

Traditional irrigation schemes using water harvesting and simple river diversions produce the bulk of rice for local consumption. With improved water management production in some areas have increased by 400 percent. The yield for different irrigation schemes are as shown below.

**Table 3.1.** Production on different types of existing schemes in Tanzania

S.No.	Type of scheme	Yield (t/ha)	Comments
1.	Traditionally irrigated	1.0-2.0	Scheme comprises water harvesting and River diversions.
2.	Improved traditional	4.0	There is River diversion and improved land development
3.	New Smallholder	2.0-6.0	In this category some of the schemes are: * Mechanised with high inputs * Using modern varieties * Having 3 crops in 2 years.
4.	Irrigation state farms	3.0-4.0	Schemes are high input packages, mechanised operations, modern varieties, but all single cropped.

As seen in Table 3.1, the state or parastatal farms could have been expected to have a high yield as they employ medium to high packages. But reverse is the case, this attributed by:

- (i) Inadequate machinery for land preparation and harvesting
- (ii) Poor seed quality badly adulterated with wild rice
- (iii) Poor designs
- (iv) Inadequate operation and maintenance of the irrigation infrastructure
- (v) Impossible cropping patterns and,
- (vi) Poor weed control and husbandry.

### 3.2 EVALUATION OF PERFORMANCE

The report of the investigation on irrigation development by the Task Force on National Agricultural Policy pointed the following areas as contributing to the poor performance of both large and small scale irrigation scheme :

- (i) absence of irrigation policy
- (ii) reliance on sophisticated irrigation technique
- (iii) lack of staff experienced in designing and constructing large scale irrigation schemes
- (iv) poor planning or irrigation projects, particularly peasant irrigation schemes.

Large scale private sector schemes are to be encouraged so long as :

- \* They are financially sustainable independently of the state
- \* They are environmentally and socially acceptable
- \* Do not put an unacceptable strain a natural resources or compete for resources with existing economic activities.

### 3.3 CONSTRAINTS ON SUCCESSFUL IRRIGATION

Several studies have identified and analysed a number of constraining influences which causes this. They can be condensed into, the Lack of well articulated policy and strategy framework, poor understanding of the real resource endowment of the country and acute financial and technological shortcomings.

## 4. INTERVENTION

Having seen the poor performance of the schemes three kinds of interventions are envisaged, and they can be prioritised as follows :

### Priority 1 - Rehabilitation or Upgrading of Traditional Irrigation schemes

This will help to increase the water use efficiency. In this aspect the improved river basin water management has to be central in this upgrading. It should be understood that the improved drainage system in order to increase return flows to the natural drainage system thereby reducing or avoiding losses from unnaturally water logged areas have to be seriously undertaken.

### Priority 2 - Schemes based on Water Harvesting Technology

This is more workable on the marginal areas. The advantage is that producers need only to be provided with appropriate technology. This means, a minimum technical intervention using simple flood management is required. Infrastructure is required to simply divert flood peaks from rivers into the fields. Such technology is simple and cheap and involves little operational sophistication. It is practised in Tanzania, in the central regions.

### Priority 3 - New smallholder Schemes

In this aspect farmers are required to be sensitised and organised into workable Water Users Organisation (WUA)'s. Having done this assignment, then the construction of a new scheme can commence.

## 5. IMPLEMENTATION

Having set the priorities right the following design issues and consideration should be the guideline.

- \* Designs should be as simple as possible
- \* There should be standardisation of the designs
- \* Avoid redundant activities
- \* Provide miscellaneous structures
- \* Provide protection works for hydraulic structures

A point worth noting is that, Tanzania has just more than 30% of the area under traditional irrigation, this implies that more work has to be done so that those few schemes can be prioritised which could be very productive.

## 6. CONCLUSIONS

- \* Poor performance have mainly been caused by ineffective coordination and planning
- \* Absence of a commitment of funds to the irrigation sector have added the poor performance status
- \* Constraints should be removed
- \* Undertaking sustainable water resource utilisation is vital

### 6.1 RECOMMENDATION

It is recommended that :

- (i) Serious considerations should be given to the national irrigation development plan
- (ii) Funds should be made available to the department.