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Agriculture and Water Resource Management: Implications for Rural Development in Sub-Saharan Africa.

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Abstract:

The planning and management of Sub-Saharan African's agricultural and water resource management by governments and private sectors are increasingly becoming more important in the face of increased agricultural activities, water for domestic and industrial use, and other activities requiring water resources. To enhance this, integrated policy approaches should be adopted to eliminate incomplete execution of policies on water resource management and haphazard implementation and project duplications on water resources. This calls for a comprehensive basic research, soil testing, water budget, and environmental pollution analysis for increased food production and other uses of water resources. Increased in food production will eventually lead to increased agro-based industries especially in the rural areas, thus enhancing even distribution of industries between rural and urban areas. This will further integrate and stabilize the rural population, thus arresting the major problem of rural-urban migration in Sub-Saharan Africa. The enormous volume of water used in raising tree crops, arable crops, fisheries, poultry, cattle, and the use for domestic and industrial purposes emphasizes the need for integration of agricultural and water resource management in Sub-Saharan Africa. Production and development in the savanna regions of southern Africa are primarily determined by interactions between the limitations imposed by ecological determinants (such as rainfall and soil quality) and the management strategies of the specific region. Good planning, focusing on both the short and long-term effects of water use, is needed in water management strategies. Botswana is already experiencing so-called 'water stress' which is related to a number of factors such as rapidly increasing population leading to a sharp increase in water demand, low and variable rainfall, high rates of evaporation, and the high cost of exploiting existing water resources. At the current rates of abstraction, the lifetime of surface and groundwater resources is limited to decades. This paper discusses the interrelationships between agriculture and water resources, identifies the need for an integration approach in food production and the essential requirements for enhancing the integrated relationship.

Introduction:

The volume of water needed to raise crops varies with the types of crops commonly grown in Sub-Saharan . The crops grown/ raised could be classified into three sections thus: (1) Livestock such as cattle, goats and sheep, poultry and fish; (2) Farm Produce such as Beniseed, millets, maize, sorghum, rice, yams cassava and ground nut, Shea nuts, peas and beans, ginger, leafy

vegetables and onion, Cocoa, Kola nuts, cashew, oil palm, Tobacco, sugarcane, coffee and tea; (3) Forest Products such as Rubber, timber, Bamboos. Each of these major crops requires different volume of water hence the crops grown are spread according to the ecological zones in the country. This is because these crops will only do well in relation to the water regime present in the various ecological zones of the Sub-Saharan region. For example, cereal crops would normally do well at optimal level if grown in a region where there will be available water to contribute as much as 70% and 95% of the total fresh weight. And at maturity, water in cereal crops would normally lose most of their water hence the level of water could decline to about 5% to 30%. (Happer,1983). Fish farming In Sub-Saharan region is based on natural surface waters such as streams rivers ,lakes and ocean. Only few artificial lakes or dams have been developed to cater for fish production. (Okereke and Egboka, 1986). The above scenario explains how important water is to crops

Conceptual Framework:

The fact is that poultry, fisheries, crop production and livestock production are directly controlled by water availability hence efficient planning and management within the agricultural and water resources sectors must be the serious concern of governments and private sectors in Sub-Saharan Africa. The planning and management team in the government and private sectors should plan for quality and quantity water supply schemes most especially to cover both rural and urban sectors of the communities. The inter-relationship between agriculture and water resources must be studied to give rise to bountiful harvests in agricultural produce. This should feature prominently in the plans of Rural development planners so as to boost agricultural production and productivity among the rural populace whose primary occupation is farming; and who are in most cases subjected to poor crop harvest as a result of insufficient water for crop production arising from drought and global warming. The interrelationships between agriculture and water resources are sketched in figure1. There is therefore the need for the researchers and all the stake holders in Agriculture, water resources and rural development workers to initiate and embark on joint programmes leading to maximum food production and water supply and rural agro-based industries.

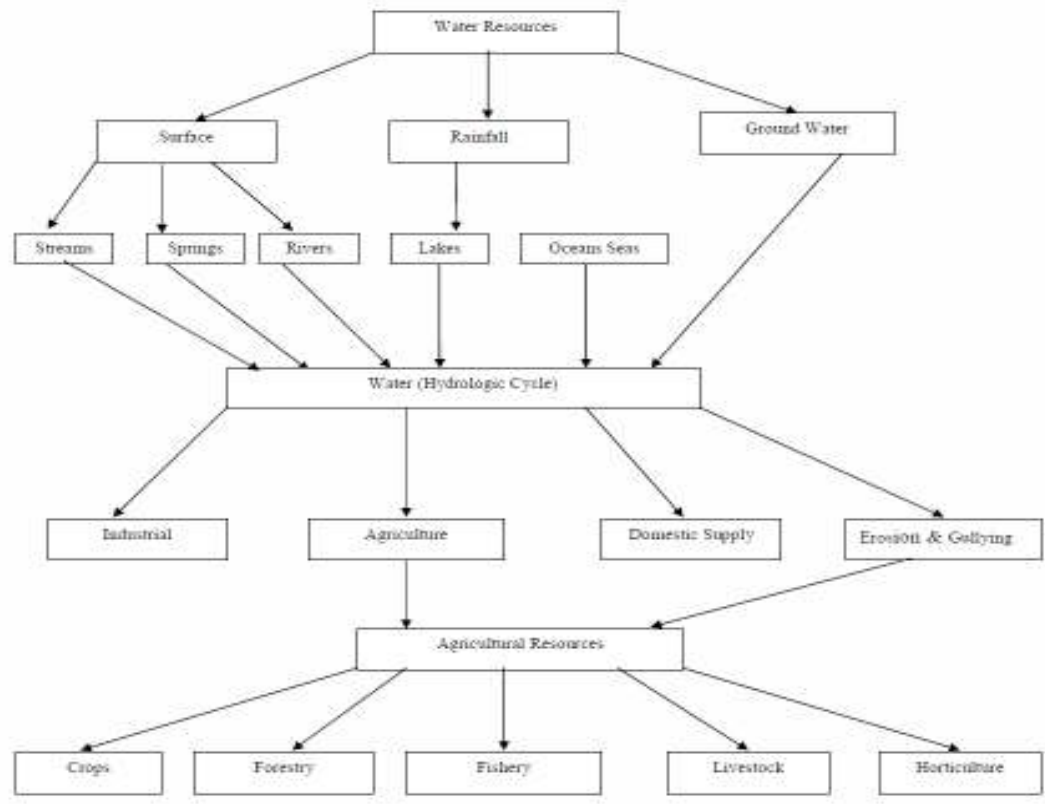


Fig. 1: Inter-Relationship Between Agriculture and Water Resources Adapted from Okereke and Egboka (1996)

Water Budget Analysis

One of the most important aspects of water resource management currently being neglected is the area of water budget analysis. For efficient management of water resources within a watershed or a basin, it is important that one should know how much water gets into or is lost from the basin, how much is taken for domestic use, irrigation or industrial use, how much escapes through evapo-transpiration or evaporation. In order to carry out water budget analysis, reliable data must be available from rainfall, temperature, runoff, hydro-graph records of surface water table below the ground water surface and data on the entire environment (Okereke 1996). Water budget analysis will allow the resource planners to know how much water is available for use in the different facets of life, how much water is actually needed, and which facet is short changed and what should be done to provide the shortfall to enhance the facet?. The facet of life concerned most in this study is the agriculture facet as this is the backbone of most of the Sub-Saharan economy and the basis for agro-industrial development.

Conclusion:

The integration of water management team into agricultural production and rural development programmes of Sub-Saharan Africa will go a long way in improving food shortage and low agricultural production and productivity in this region. Eventually this could also help to arrest hunger and poverty and malnutrition typical of most people in the region, especially in the rural areas where there are little or no industries. This paper is of the opinion that good water management could lead to good harvest in agricultural produce. This could later pave way for small scale agro-based industries which could eventually be used to achieve food production and small scale industries in the rural country sides of the Sub-Saharan region.

References:

Haper, F. (1986). *Principles of Arable Crop Production*. Granader Publishing, Bungay, Suffolk, Britain

Okereke, G.U and Egboka, C.E. (1986) *Rural Development in Nigeria*, Volume 2, Number1, June,.

Okereke, G.U. (1996). Soil Inventory and Land use Planning for Agriculturists. *Proceedings of Earth Science Symposium*, Ibadan, july.