# Chapter 33
# Water, Food Security, and Trade in Sub-Saharan Africa

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## ABSTRACT

*Water is essential for food production and it plays an important role in helping countries achieve food security. The effect of climate change poses significant threats to agricultural productivity in Sub-Saharan Africa, where 95% of agriculture is rain-fed. Changes in weather patterns in the form of prolonged drought and severe flooding, in addition to poor water and land agricultural management practices, has resulted in a significant decline in crop and pasture production in several African countries. The agricultural sector in the region faces the challenge of using the existing scarce water resources in a more efficient way. Most of the countries have failed to achieve food self-sufficiency and rely on imports to meet the demand for food. Agricultural trade can play a significant role in helping countries in Africa achieve food security by increasing availability and access to food in countries that are experiencing food insecurity.*

## INTRODUCTION

The Sustainable Development Goal (SDG) 2 aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture. It calls for the universal access to food while increasing productivity and income of small-scale farmers. Achieving food security will mean that consumers have access to the resources they need to purchase food. In addition, achieving food security depends on a healthy and sustainable food system. Water is essential for food production and rain-fed and irrigated agriculture play a key role in achieving food security. 815 million people are currently undernourished (Food and Agriculture Organization of the United Nations [FAO], International Fund for Agricultural Development [IFAD], United Nations International Children's Emergency Fund [UNICEF], World Food Programme [WFP], & World Health Organization [WHO], 2018) and the global population is projected to increase by 30% to 9.3 billion people by 2050 (United Nations [UN], 2017). To achieve SDG goal 2, these people will have to be fed in a sustainable manner utilizing scarce water and resources. To feed these additional people, it has been estimated that food production will have increased by about 60%

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by 2050, utilizing the existing resources of land and water (Breene, 2016). In addition to population growth, as a result of increased incomes and changing diet patterns, consumption patterns are switching to increased consumption of beef, dairy, and other livestock products, which require substantial amounts of water to produce. In spite of this, it has also been predicted that approximately 440 million people will still suffer from hunger by 2030.

Achieving the required increase in food production is a daunting task and it is of utmost importance that changes are made across the entire agriculture production chain, to ensure optimum use of the global water resources to meet the growing demand for food. About 80% of the global agriculture is rain-fed. However, to meet the growing demand for food over the years, irrigation has been adopted by many countries as a strategy to increase crop yield per unit area of land. The increased adoption of irrigated agriculture to boost food supplies has placed severe strain on available water resources and agriculture is now responsible for about 71% of the global freshwater withdrawals (FAO, 2014).

Studies on climate projections suggest that that global freshwater resources are vulnerable and have the potential to be strongly impacted by climate change (Bates, Kundzewicz, Wu, & Palutikof, 2008; Parry, Canziani, Palutikof, van der Linden, & Hanson, 2007). In sub-Saharan Africa, climate change poses significant threats to agriculture systems and can impact agriculture productivity, which is severely affected by drought and flooding conditions. The Gross Domestic Product (GDP) of some countries in the region is heavily dependent on agricultural production and it has been predicted that climate change may reduce potential crop yields in some sub-Saharan Africa by 50% leading them to spend 5-10% of their GDP to adapt to the effects of climate change (Intergovernmental Panel on Climate Change [IPCC], 2007). Changes in weather patterns in the form of prolonged drought and severe flooding has resulted in significant declines in crop and pasture production in several countries. For example, Malawi loses approximately 1.7% of its GDP to drought-related events and flooding incidents (Pauw, Thurlow, & Van Seventer, 2010), while it has been estimated that Kenya loses 2.4% of its GDP to drought and flooding (Sanctuary, Tropp, & Haller, 2005). Changes in the quantity and intensity of rain and changes in rainfall patterns make it difficult for farmers to plan their operations, may reduce the cropping season, and lead to low germination, reduced yield, and crop failure. In addition, the increased frequency of storm events damages farmland, crops, and livestock.

The agricultural industry in Africa is faced with the challenge of using the existing and scarce water resources in a more efficient way. Population growth in sub-Saharan African countries has resulted in an increase demand for food. However, most of the countries have experienced low agriculture productivity in recent years, which has led to a change from being net agricultural exporters of food to net agricultural importers. Agriculture international trade can play a significant role in helping countries in Africa achieve food security by increasing availability and access to food in countries that are experiencing food insecurity. It can also help to solve the problem of instability of food prices as a result of severe weather events and increase diversity and range of food available in a particular region.

This chapter will focus on the relationship between water, food security, and agricultural trade in Africa. The work will be conducted as a desktop survey reviewing literature from various academic publications and national and international documents.