

Salt Affected Soils in the Awash River Basin of Ethiopia

Aweke M. Gelaw, Ethiopian Agricultural Transformation Agency, Addis Ababa, Ethiopia,

Ermias A. Betemariam, World Agroforestry Center, Nairobi, Kenya



INTRODUCTION

The Awash River Basin is the most important river basin in Ethiopia. It originates from central-west part of the country, flows along the Rift Valley into the Afar Triangle, and terminates into the salty Lake Abbe on the border with Djibouti. The total mean annual flow from the river basin is estimated to be 4.9 billion cubic meter (BMC) and the estimated irrigation potential is around 134 thousand hectares. Generally, the basin is divided into three valleys: upper, middle, and lower Awash valleys.

Ethiopia's limited large-scale irrigation projects are found in the Awash basin. However, operation and management of irrigation infrastructures are dominated by traditional practices and not well supported by scientific knowledge and tools to enhance efficient use of water. Major concerns emanating from such inefficient irrigation water management are over-irrigation and related poor drainage, rise in ground water levels, waterlogging, salinity, and alkalinity development in irrigated areas.

METHODOLOGY

This study was solely based on review of research works conducted in the river basin by different researchers.

RESULTS

About 90% of the sugarcane plantation fields at Wonji (Upper Awash) are critically waterlogged with a ground water table depth of 1.5 m below the soil surface and the causes for rising water table could be attributed to excessive irrigation practices. On the other hand, at Metehara (Middle Awash), a significant area of the farm has been converted into highly saline soils especially in areas with shallow ground water table depth and underlined by the lacustrine sediments near to the saline Lake Beseka. Similarly, around 80 % of irrigation farms at Dubti (Lower Awash) has been affected by various degrees of salinization. Further, increasing development of salinity in the middle and lower Awash valleys due to mismanagement of irrigation water represents a serious threat to the sustainability of the irrigation schemes (Fig 1).

CONCLUSIONS

The Awash River basin where over one-third of the largescale irrigation schemes of the nation are concentrated is a typical example of the problem of secondary salinization. Extensive areas of irrigated lands in the valley have been degraded and abandoned due to over-irrigation and poor drainage practices. The problem of secondary salinization will go on expanding at a rate faster than ever before leading to more lands to be out of cultivation unless a rigid control of salts in the soil is practiced, and the three components: soil, irrigation water and crops are properly managed.

Mean Water Salinity (EC in mmhos cm⁻¹)

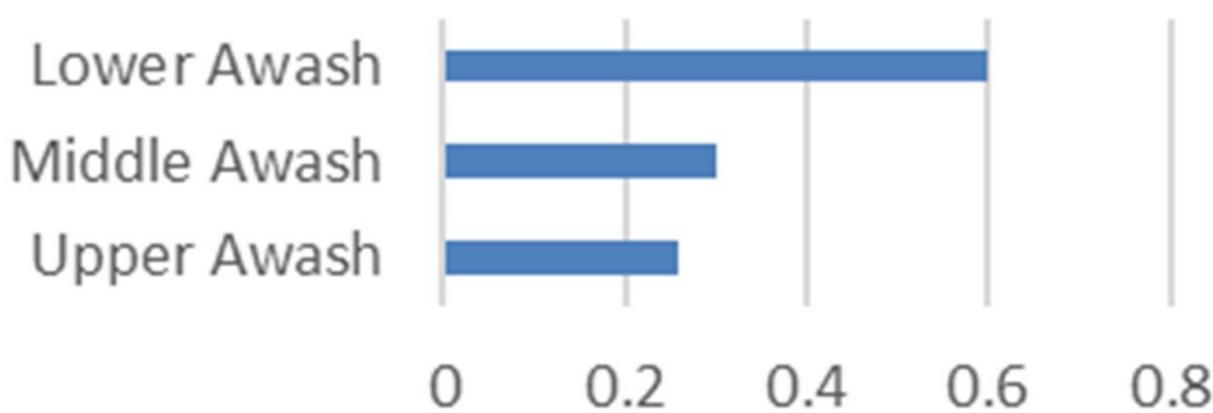


Fig 1. Mean salinity level of the Awash River Water at upper, middle and lower basin (Adapted from Girma et al. 2012)