Chapter 11
Potential Impacts of Climate Change on the Inland Fisheries of Arid and Semi-Arid Regions of Africa:
Impacts of Climate Change on Inland Fisheries

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ABSTRACT

Inland fisheries of arid and semi-arid regions of Africa are seriously threatened by negative impacts of climate change. Literature and several models show increase in temperature of 1.1°C in some areas. Sea level rise is projected to increase to 0.8 m by the year 2100. Fish yields have increased almost linearly by around half a million metric tons per decade over the past 60 years, while clear cyclical variations in the residuals of about 20 years' periodicity above and below the trend line have been observed. Although fisher folks, their communities, and local institutions are already constantly adapting to various forms of change, flimsiness in the wider governance and macro-economic environment has weakened the overall adaptive capacity of these regions and fishers are vulnerable to projected climate change. For significant benefits of inland fisheries to be accomplished, planned adaptation at scales from the local to the regional is very necessary.

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INTRODUCTION

Climate change is the fluctuations in the patterns of climate over long periods. According to the United Nations Framework Convention on Climate Change, it is a change of climate which is attributed directly or indirectly to human activities that alters the composition of the global atmosphere (UNFCCC, 2008). The change may be limited to a specific region, or may occur across the whole earth. According to Akpomi and Vipene (2016) harmful effects of climate change include interuption in seasonal cycle. Ecosystem, agriculture, food supply and water need are also adversely affected. Akuru *et al*., (2013) posited that the two factors that cause Climate change include natural processes (biogeographical) and human activities (anthropogenic). The natural processes are the astronomical factors which include the changes in the earth's orbit. The anthropogenic factors in climate involves human activities that either emit large amount of greenhouse gases (GHGs) into the atmosphere, which deplete the ozone layer, or reduce the amount of carbon absorbed from the atmosphere. Human activities that emit large amount of greenhouse gases (water vapour, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs)) into the environment include industrial burning of fossil fuel, agriculture, urbanization and gas flaring whereas deforestation, alteration in land use, water pollution and agricultural practices reduce the amount of carbon sinks.

The relevance of inland fisheries cannot be overemphasized considering its importance to man such as supply of dietary protein and source of revenue to many. The semi-arid regions harbour some of the most important inland fisheries in the world (Kolding et al., 2016a) and according to IPCC (2014), future climate change will impact seriously on the production systems and livelihoods as well as the fisheries in arid and semi-arid areas of Africa. There is now a strong consensus that climate change presents a fundamental challenge to the well-being of all countries, with potential of being the harshest on countries already suffering from water scarcity. According to Ibid. water scarcity is a well-established context for development in arid and semi-arid countries.

Despite the growing understanding of the global climate change, great uncertainties exist in the prediction of responses of arid and semi-arid regions to global and regional, natural and human-induced climate change. An IPCC report (IPCC, 2007) forecasts that rainfall patterns, river flows and sea levels all over the world will be affected by climate change over the next century whereas an expected precipitation decrease over the next century of 20% or more is envisaged in many parts of the arid and semi-arid regions. Even if efforts to reduce greenhouse gas emissions are successful, it is no longer possible to avoid some degree of global warming and climate change. For any meaningful development to be achieved in the arid and semi-arid zones, the challenges posed by climate change to inland fisheries need to be identified, examined and adaptation strategies proffered. This chapter presents the possible causes of climate change, impact of climate change on inland fisheries, aquatic ecosystem and fishing communities of the arid and semi-arid regions with a focus on case-studies in Africa. Potential adaptation measures are also highlighted and mitigation option suggested.

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