CLIMATE CHANGE AND FISHERIES IN AFRICA: ISSUES AND CHALLENGES

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Introduction:

It has been ascertained that climatic changes will have a wide range of direct and indirect impacts on aquatic ecosystem, capture fisheries, and aquaculture with a great implications for fisheries-dependent economies if not mitigated. Africa has been considered more vulnerable to the effect of these changes than developed countries due to capacity for adaptability and weak economic power to tackle the problem. As fisheries provide significant feed and seed inputs, the impacts of climate change on them will also affect the productivity and profitability of aquaculture operation. Climatic changes could induce physiological stress on cultured stock and causes metabolic disorder, which would not only affect fish productivity but also increase vulnerability to diseases, impose higher risks and reduce returns to farmers. Fisheries and aquaculture provides an important source of cash income for many poor households, and serve as the main source of food for a billion people worldwide, providing a valuable protein complement to the starchy diet common among the global poor, and essential fatty acid especially n- 3 PUFAs (DHA, EPA). This paper will examine the way in which climatic changes affect fisheries and aquaculture production, and recommend some measures.

Possible effect of climatic changes on fisheries and aquaculture

Fisheries productivity: Global climatic changes are suggested to potentially affect freshwater fisheries by lowering productivity in wild fish populations and in intensive aquaculture systems worldwide [4]. As fishes are poikilotherms, drastic change in their surrounding water temperature will influence their metabolic processes, behavior, migration, growth, reproduction, and survival [9]. Reproduction of fish is often highly sensitive to fluctuations in temperature [5] and so warming can have either a positive or negative effect on egg production, depending on whether the target fish species is close to its thermal optimum. The area and structural complexity of the coral reefs, sea grasses and mangroves that provide shelter and food for many coastal fish species are likely to be altered by rising water temperature, acidification of the ocean, changes in sedimentation from new patterns of rainfall and rising sea levels [8]. Recent declines in fish abundance in the East African Rift Valley lakes have been linked with climatic impacts on lake ecosystems [7]. Lake Tanganyika, for example, has historically supported one of the world's most productive pelagic fisheries. A 30 to 50% decline in clupeid catch since the late 1970s has been attributed partially to environmental factors, because the lake had sustained high yields under similar fishing pressure for the previous fifteen to twenty years, although contrasting views have been expressed [10]. The decline in catch was accompanied by breakdown of the previously strong seasonal patterns in catch, suggesting decoupling from ecosystem processes driven by the weakening of hydrodynamic patterns. These changes in the pelagic fishery are consistent with a lakewide shift in ecosystem functioning [7].

Aquaculture production:

Changes in climate have been reported to induce both direct (e.g. through physical and physiological processes) and indirect (e.g. through variations in fishmeal supplies and trade issues) impacts on aquaculture [2]. It was noted that the physical changes related to climatic changes, i.e. in temperature, solar radiation, current and wave actions, sea level rise, stress due to oxygen deficit, and the frequency of extreme events; will impact physiological, ecological and operational (e.g. species and site selection, containment technologies, etc.) processes. In a work conducted [1] on the effects thermal tolerance and metabolic activity of yellowtail catfish, *Pangasius pangasius,* it was reported that fish show different behavioural responses to temperature variation ranging from, restlessness, escape attempts, unorganized swimming with an attempt to jump out of the aquarium at temperature of between 39-42 °C. However, rapid or dramatic increases in temperature above normal maximum temperatures are expected to have significant negative effects on overall viability of some fish populations [6].

Conclusion:

In general, responses to direct impacts of extreme events on fisheries and its communities are likely to be more effective if they are anticipatory, as part of long-term integrated management planning. However, preparation should commensurate with risk, as excessive protective measures could themselves have negative social and economic impacts [3]. Considering the gravities of this issue, it is high time to discuss on common platform with technocrat and bureaucrats for framing a need-based policy, and strategy to mitigate the stem causes due to climatic changes. There is need for

collaboration among African scientist to cross fertilize ideas and develop a workable strategy on how to mitigate the effects on the continent. Also government at all level should involve both privates sector and civil society for effective implementation of any adopted strategies, and educate the populace, rural and fishing communities on the likely consequences of their action on the planet earth.

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