**Modeling of climate change impacts on Agrobiodiversity in the Bamenda Highlands of Cameroon**

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Ensuring food security in the face of climate change is among the most daunting challenges facing humankind. A key question is, “on the basis of existing data on existing ecological systems, how is agrobiodiversity likely to change in the future and what are the implications for local agriculture and natural resource use and management?” Taking the Bamenda highlands of Cameroon as an example, a twenty-five year climatic data (rainfall and temperature), and crop yield statistic over the same period (1991 to 2016) were collected. Field visits and focus group interviews with some 140 farmers purposely selected complemented the database. Multiple regression analysis was used to test if the climatic variables significantly predicted change in agrobiodiversity. The results showed that, on average, the mean annual temperature of the region increased by.040C per year over the last 25 years. Other impacts range from increasing droughts to shifting agricultural calendars in unpredictable ways.Probably, because of the droughts and floods: (1) streams that once served as sources of potable water are now filled with mud**/**silt, and some have either completely dried up or become seasonal and not suitable for drinking anymore, contributing to the current scarcity of water in the region. (2) aquatic and terrestrial biodiversity are declining**.** The African lungfishes, *Protopterus annectens*,for example, that was once a common catch and cheap source of protein for households are now rare to near extinction, especiallyinurban and peri-urban areas; (3)yields of major subsistence crops such as *Colocasia spp*., *Colocasia esculenta*, *Zea mays*, and cash crops such as tea (*Camellia sinensis*) are on the decline. Rainfall significantly predicted crop yield (β = .56, p<.01), as did temperature (β = -.36, p<.01). The two predictors explained 43% of the variance in yields (R2=.43, F (2, 140) = 5.56, p<.01). Declining yields have led to high prices of food items in the market, undermining food security. To cope with and mitigate the adverse effects of climate changerisks, the model of complex environmental safety system is proposed.This model could be instrumental to thedevelopment of heat and drought-resistant high-yielding crop varieties.

**Keyword:** *Bamenda highlands, Agrobiodiversity, complex environmental safety system*