Forest Day in Bali, Indonesia, 8 December 2007: Shaping the Global Agenda for Forest & Climate Change

Kwame Nkrumah University of Science & Technology Kumasi, Ghana

CIFOR CATIE Centro Agronómico Tropical de Investigación y Enseñanza European Union

CLIMATE CHANGE AND VULNERABIITY OF RIVER OFFIN BASIN AND ITS DEPENDENT COMMUNITIES IN GHANA

B. A. Gyampoh[a], S. Amisah[a], M. Idinoba[b] and J. Nkem[b]

[a]Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

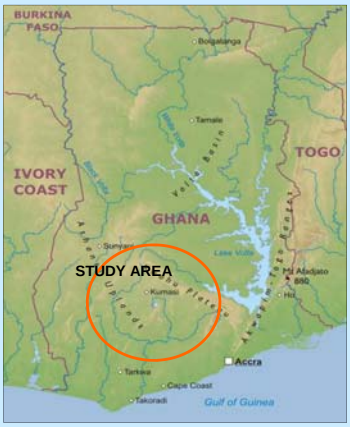
[b]Center for International Forestry Research, 06 BP 9478 Ouagadougou 06 Burkina Faso

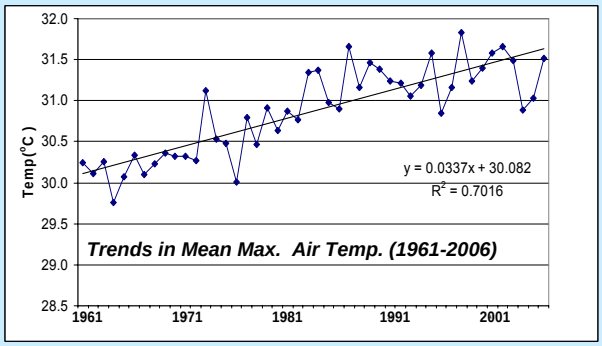
Introduction

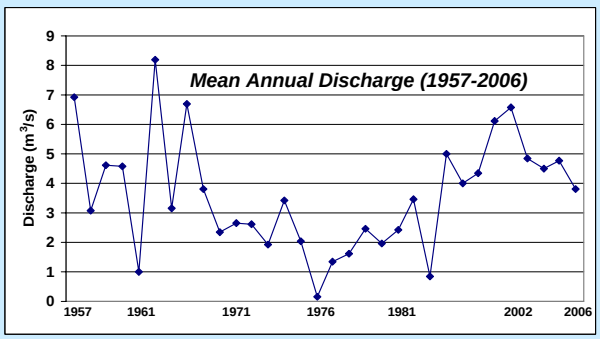
West Africa experienced severe effects of climate change on water resources and livelihoods in the past decades. Mean annual rainfall decreased by 10% in the Wet Tropical Zone to more than 30% in the Sahelian Zone, whiles average discharge of the region's major river systems dropped by 40 to 60% in the 1970 (Niasse, 2005). This study examines rainfall and temperature patterns in the Offin river basin in Ghana and assesses the vulnerability and adaptation option of Offin river basin and its dependent communities to climate change and variability.

Material & Methods

- Long term (1961-2006) rainfall and temperature was analysed to establish historical trends.
- Historical river discharge was determined using river height measurements (2002-2006) to construct rating curves
- The rate equations used to estimate the river discharge at recorded river heights from 1957 to 2006.
- Livelihoods under CC were evaluated through interviews, focus group discussions, questionnaires, with CRISTAL 3.0 (**C**ommunity-based **R**isk **S**creening **T**ool-**A**daptation & **L**ivelihoods)



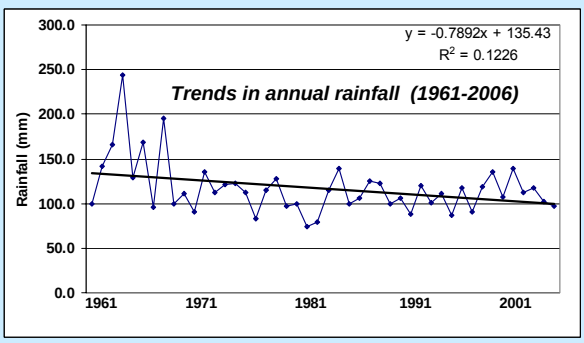




Main Findings

Mean precipitation in Offin River Basin:

- decreased by 22.2%, and this is expected since dry conditions have prevailed in most parts of West Africa since the late 1960s.
- total annual rainfall was considerable variable with sharp decreases in mean (≤1200mm) between 1985 and 2000.



Mean Max. & Min. Air Temperatures

- Gradual rise in average max. temperatures from 30.2°C in 1961 to 31.5°C in 2006, indicates a 1.3°C or 4.3% rise.
- Average min. temperature changes indicated a rise of 1.0 oC (4.7%)

Discharge/Flow of River Offin

- Showed variation over the years and a decrease from 6.94 $m^3 s^{-1}$ in 1957 to 3.80 $m^3 s^{-1}$ in 2006, yielding a 45.3% of reduction
- Reduction in river flow can be accounted for by the deforestation rate (2%), combined with high temperature and reduced rainfall

Livelihoods & CC

- Livelihoods are very vulnerable due three main climate-related hazards: prolonged inadequate rainfalls, drought and extreme heat that compromise agriculture productivity.
- Coping strategies by the communities include water rationing, protection of water sources through community taboos and laws, replanting failed farms, awareness campaign on deforestation around water bodies
- Despite these existing coping strategies, community strongly believe that "finance" is the answer to effects of CC at local level.

Conclusions

There has been significant change in the climate pattern in the River Offin basin and this has affected the livelihood resources of people living in the basin. With the climate situation expected to worsen and water resources also very sensitive to climate change, livelihoods in the River Offin basin are at a greater risk there is therefore need to modify and integrate some of the traditional coping/ adaptation practices with innovative measures to respond to future trends in CC.

Photo by the authors, poster layout by Patrice Savadogo