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NR > Vol.2 No.4, December 2011

OPEN ACCESS

Climate Change Impacts, Local Knowledge and Coping Strategies in the Great Ruaha River Catchment Area, Tanzania

PDF (Size: 124KB) PP. 212-223 DOI : 10.4236/nr.2011.24027

Author(s)

Richard Kangalawe, Shadrack Mwakalila, Petro Masolwa

ABSTRACT

Climate change has profound implications for managing freshwater resources and species dependent on those resources. Water is an essential component of the life support system of the earth, and a basic resource for socio-economic development. The Great Ruaha River Catchment Area is a dynamic and complex ecosystem requiring inclusion climate change adaptation in the management of the freshwater and natural resources available to reduce the severity of climate change impacts. Rainfall has decreased considerably during the last 10 - 30 years, and characterised by high interannual variability, seasonal shifts and variable seasonal distribution with unpredictable onset and ending of rains and shortened growing seasons. Temperature has increased considerably during this period causing increased evapotranspiration losses and incidences of pest and diseases. The freshwater of Ruaha River and its tributaries are vulnerable to changing climate, such as drought, which can negatively impact on the livelihoods of the people through decreased crop and livestock production, and on local biodiversity. The changing climate has had negative impacts on, among other aspects, land use and water shortages for irrigation, livestock and domestic uses. This has compelled riparian communities in the catchment to devise coping strategies including practicing irrigation to provide supplementary water to crops, using drought tolerant crop varieties, rationing of irrigation water in farmlands, wetland cultivation, and diversification to non-agricultural activities. Despite the existence of many indicators used for local climate forecasting, there are limitations to local adaptation, including among others, poverty, institutional aspects and limited integration of climate adaptation in various sectors. The bulk of indigenous knowledge could be integrated into formal adaptation planning, and may be important components of environmental conservation at the local level.

KEYWORDS

Climate Change, Local Knowledge, Coping Strategies, Great Ruaha River Catchment, Tanzania

Cite this paper

R. Kangalawe, S. Mwakalila and P. Masolwa, "Climate Change Impacts, Local Knowledge and Coping Strategies in the Great Ruaha River Catchment Area, Tanzania," *Natural Resources*, Vol. 2 No. 4, 2011, pp. 212-223. doi: 10.4236/nr.2011.24027.

References

- [1] J. H. Matthew and T. L. Quene, "Adapting Water Management: A Primer on Coping with Climate Change," World Wildlife Fund (WWF), Washington, DC, 2009.
- [2] M. De Villiers, "Water: The Fate of Our Most Precious Resource," Houghton Mifflin Company, Boston, 2000.
- [3] S. Postel and B. Richter, "Rivers for Life: Managing Water for People and Nature," Island Press, Washington DC, 2003.
- [4] T. L. Crisman, L. J. Chapman, C. A. Chapman and L. S. Kaufman, "Conservation, Ecology and Management of African Freshwaters," University Press of Florida, Gainesville, 2003.
- [5] United Republic of Tanzania-URT, "National Water Policy," Ministry of Water and Livestock Development, Dar es Salaam, 2002.

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- [6] S. S. Mwakalila, " Opportunities and Challenges for Sustainable Water Resources Management in Tanzania," *Geographical Journal*, Vol. 174, No. 2, 2008, pp. 149-175. doi:10.1111/j.1475-4959.2008.00286.x
- [7] United Republic of Tanzania-URT, " National Strategy for Growth and Reduction of Poverty (NSGRP)," President's Office, Dar es Salaam, 2005.
- [8] S. Agrawala, A. Moehder, A. Hemp, M. Van Aalst, S. Hitz, J. Smith, H. Meena, S. Mwakifwamba, T. Hyera and O. Mwaipopo, " Development and Climate Change in Tanzania: Focus on Mount Kilimanjaro," OECD, Paris, 2003
- [9] R. Y. M. Kangalawe, C. G. Mung'ong'o, P. Z. Yanda, A. G. Mwakaje and E. Kalumanga, " Climate Change and Variability Impacts, Vulnerability and Adaptive Capacity of Natural and Social Systems in Kasulu District, Tanzania," In: P. S. Maro and A. E. Majule, Eds., *Strengthening Local Agricultural Innovations to adapt to Climate Change in Botswana, Malawi, South Africa and Tanzania*, 2009, pp. 224-243. <http://www.sadc.int>.
- [10] M. Mumba, " Adapting to Climate Change: Lesson from Lake Bogoria Catchments, Kenya," Programme Report No. 3/08, Nairobi, 2008.
- [11] E. J. Mpeta, " Expected Climatic Changes in Tanzania," Proceedings of Project Workshop on Impacts of Climate Change on Water Resources and Agriculture— and Adaptation Strategies in Vietnam and Tanzania—(CLIVET), Dar es Salaam, 2009.
- [12] R. Y. M. Kangalawe, " Mainstreaming Climate Change Adaptation in the Management of Freshwater Resources in the Rufiji Basin," A Consultancy Report Submitted to the Ruaha Water Programme, WWF-Tanzania Country Office, Dar es Salaam, 2010.
- [13] R. Y. M. Kangalawe and J. G. Lyimo, " Climate Change and Its Impacts on Rural Livelihoods in Semiarid Tanzania," In: P. S. Maro and A. E. Majule, Eds., *Strengthening Local Agricultural Innovations to Adapt to Climate Change in Botswana, Malawi, South Africa and Tanzania*, 2009, pp. 136-150. <http://www.sadc.int>.
- [14] G. C. Nelson, Ed., " Agriculture and Climate Change: An Agenda for Negotiation in Copenhagen," 2020 Focus No. 16, 2009. <http://www.ifpri.org/2020/focus/focus16.asp>
- [15] E. T. Liwenga and R. Y. M. Kangalawe, " Climate Change/ Variability and Implications on Agricultural Production and Livelihoods in the Southern Highlands of Tanzania," In: P. S. Maro and A. E. Majule, Eds., *Strengthening Local Agricultural Innovations to Adapt to Climate Change in Botswana, Malawi, South Africa and Tanzania*, 2009, pp. 124-135. <http://www.sadc.int>.
- [16] WRI, " World Resources: A Guide to Global Environment, 1996-1997," World Resources Institute, United Nations Environment Program, and World Bank, Oxford University Press, Oxford, 1996.
- [17] R. S. Odingo, " Implications for African Agriculture of the Greenhouse Effect," In: H. W. Scharpenseel, M. Schomaker and A. Ayoub, Eds., *Soils on a Warmer Earth: Proceedings of an International Workshop on Effects of Expected Climate Change on Soil Processes in the Tropics and Subtropics*, Elsevier Press, Nairobi, 1990.
- [18] FAO, " The State of Food Insecurity in the World," Food and Agriculture Organization of the United Nations, Rome, 1999.
- [19] M. G. G. Mtahiko, E. Gereta and A. R. E. Kajuni, " Towards an Ecohydrology-Based Restoration of the Usangu Wetlands and the Great Ruaha River, Tanzania," *Wetlands Ecology and Management* Vol. 14, No. 6, 2006, pp. 489- 503. doi: 10.1007/s11273-006-9002-x
- [20] UNEP, " One Planet Many People: Images of Africa's Changing Lakes," Division of Early Warning and Assessment (DEWA), United Nations Environment Programme (UNEP), Nairobi, 2005.
- [21] J. Kashaigili, K. Rajabu and P. Masolwa, " Freshwater Conservation and Climate Change Adaptation—A Case Study of the Great Ruaha River Catchment in Tanzania. Climate Change: Global Risks, Challenges and Decisions," Earth and Environmental Science Series, IOP Publishing Ltd, Bristol, 2009.
- [22] IPCC, " IPCC 3rd Assessment Report—Climate Change 2001: Working Group II: Impacts, Adaptation and Vulnerability," 2001. <http://www.ipcc.ch/ipccreports/index.htm>
- [23] M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C. E. Hanson, Eds., " Climate Change 2007: Impacts, Adaptation and Vulnerability," Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC, Cambridge

University Press, Cambridge, 2007.

- [24] S. W. Lindsay and W. J. M. Martens, " Malaria in the African Highlands: Past, Present and Future," Bulletin of the World Health Organization, Vol. 76, No. 1, 1998, pp. 33- 45.

- [25] R. Y. M. Kangalawe, " Impact of Climate Change on Human Health: Example of Highland Malaria— Mbeya Region," Research Report Submitted to the Division of Environment, Vice President' s Office, Dar es Salaam, 2009.

- [26] Tearfund, " How to Integrate Climate Change Adaptation into National-Level Policy and Planning in the Water Sec- tor: A Practical Guide for Developing Country Governments," Tearfund, Teddington,