



Geographic distribution and environmental characterization of livestock production systems in Eastern Africa

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ABSTRACT

The central role played by livestock in the livelihoods of rural households in the developing world is seldom fully appreciated by policy makers, development agencies and donors. Knowledge gaps in the geographic distribution and environmental determinants of farming systems, especially if viewed through the livestock lens, compound this problem. We have produced a map of pastoral, agro-pastoral and mixed farming systems across Eastern Africa, by analysing datasets collected in the framework of livelihood analysis. Input data were gathered between 2000 and 2007 by various emergency and development agencies for Djibouti, Eritrea, Kenya, Somalia, Uganda and parts of Ethiopia and Sudan. A quantitative definition of the production systems is adopted, based on the ratio of livestock- to crop-derived income. The resulting livelihood-based map of livestock production systems was compared through correspondence analysis to an alternative livestock production systems map, produced independently from environmental data. Convergence between the two mapping approaches was evident. The geographic distribution of the livestock production systems was also modelled using multivariate analysis of remotely sensed and other geospatial datasets. Models show high statistical accuracy, and were thus used to fill the gaps in the observed distribution of livestock production systems. Finally, selected environmental factors underpinning the systems (agro-climatology, human and livestock populations and land cover) were analysed in detail, enabling the livestock production systems to be characterized in terms of them. The regional scope of the map, as well as its direct link with a vast amount of livelihood information, render it a valuable tool for a range of development and research applications, including those related to global change.

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Abbreviations: CIESIN, Center for International Earth Science Information Network, Columbia University; CIAT, Centro Internacional de Agricultura Tropical; DPPA, Disaster Prevention and Preparedness Agency, Ethiopia; EWU-MAAIF, Early Warning Unit/Ministry of Agriculture, Animal Industries and Fisheries of Uganda; EC, European Commission; ECHO, European Commission's Humanitarian Aid Department; ESA, European Space Agency; FEG, Food Economy Group; FEWS-NET, Famine Early Warning System Network; FAO, Food and Agriculture Organization of the United Nations; FSAU, Food Security Analysis Unit, Somalia; GIS, geographic information system; GLC2000, Global Land Cover 2000; GRUMP, Global Rural–Urban Mapping Project; GLW, Gridded Livestock of the World; HEA, Household Economy Approach; IGAD, Intergovernmental Authority on Development; IPFRI, International Food Policy Research Institute; IFAD, International Fund for Agricultural Development; ILRI, International Livestock Research Institute; IC, Italian Cooperation; KFSM, Kenya Food Security Meeting; LCCS, Land Cover Classification System; LGP, length of growing period; LID, Livestock in Development; LPI, Livestock Policy Initiative; MERIS, medium resolution imaging spectrometer; NFIS, National Food Information System of Eritrea; NGO, non-governmental organization; PAAT, Programme against African Trypanosomiasis; SPOT, Satellite Pour l'Observation de la Terre; SC-UK, Save the Children–United Kingdom; SNNPR, Southern Nations, Nationalities, and Peoples' Region, Ethiopia; SSCSE, Southern Sudan Centre for Census, Statistics and Evaluation; SIDA, Swedish International Development Cooperation Agency; C, total household income deriving from crops; L, total household income deriving from livestock; TLU, tropical livestock units; UDDM, Ugandan Department of Disaster Management; UN, United Nations; UNOCHA, United Nations Office for the Coordination of Humanitarian Affairs; USAID, United States Agency for International Development; WB, World Bank; WFP, World Food Programme.

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