



# Simulation of grazed grassland productivity in Ethiopian Highlands - PART II

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# Resources / Limitations

Site : Addis Abeba

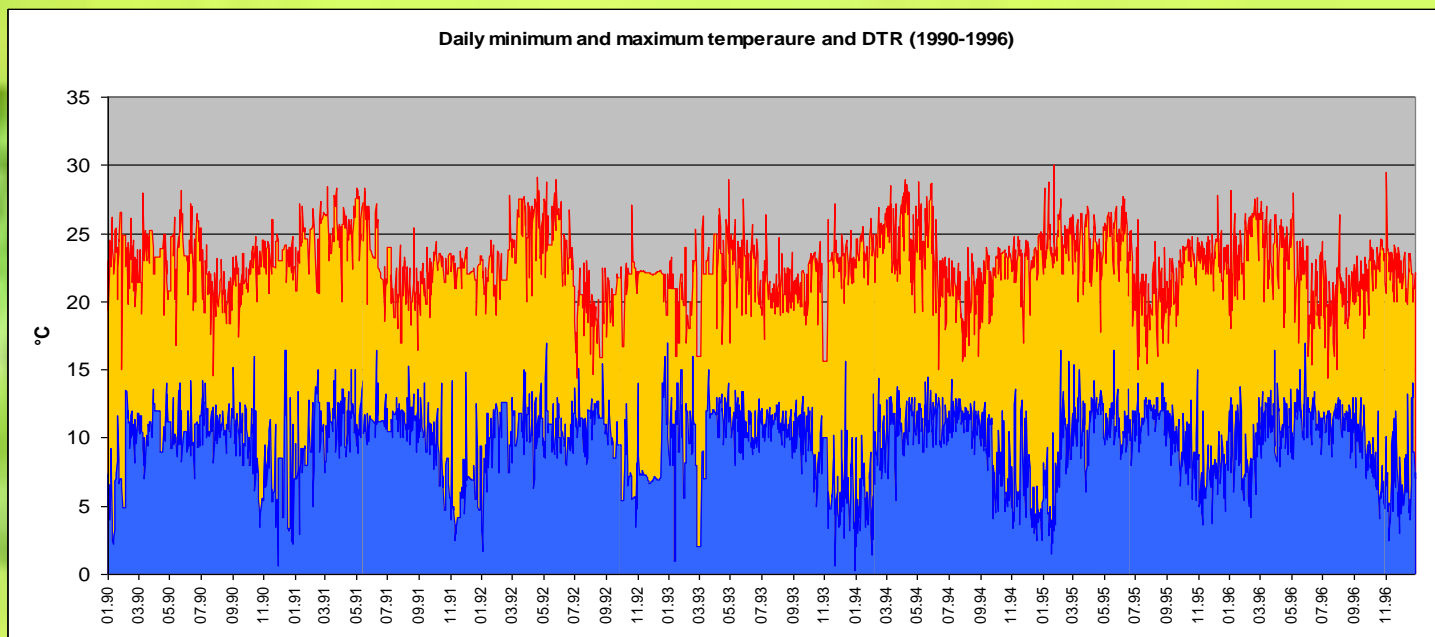
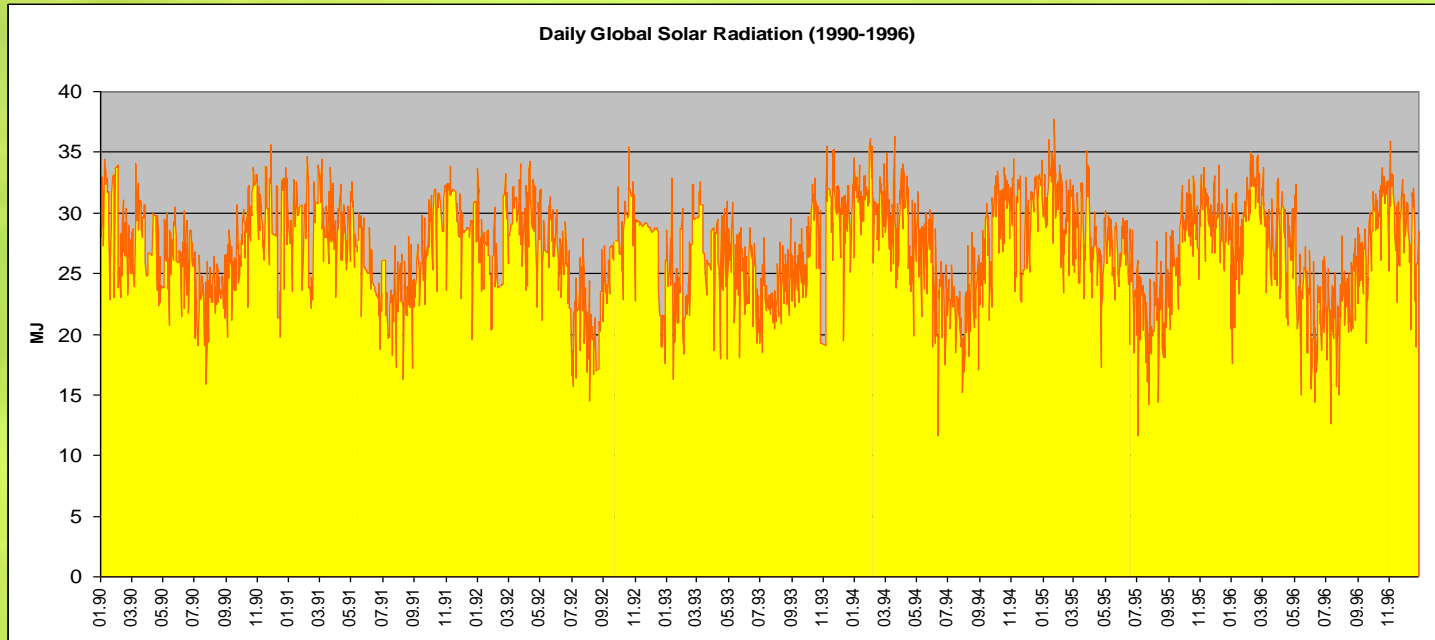
- RADIATIVE

- THERMAL

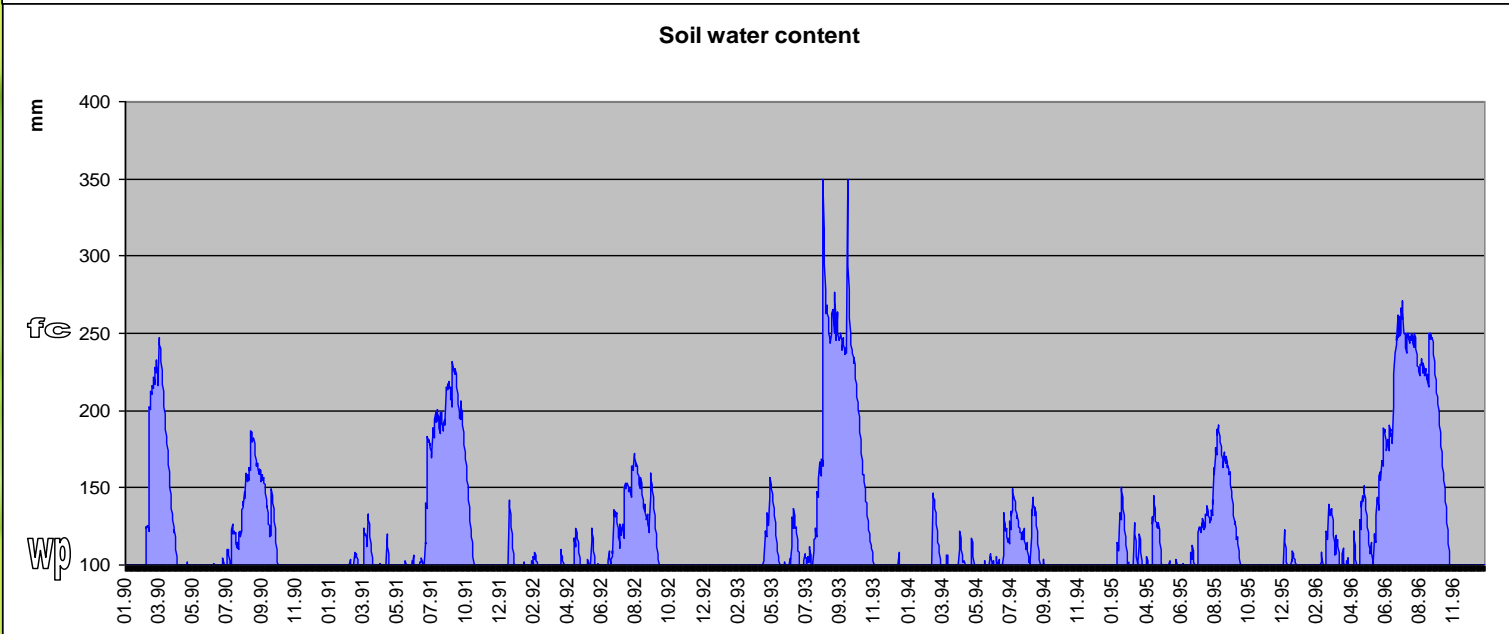
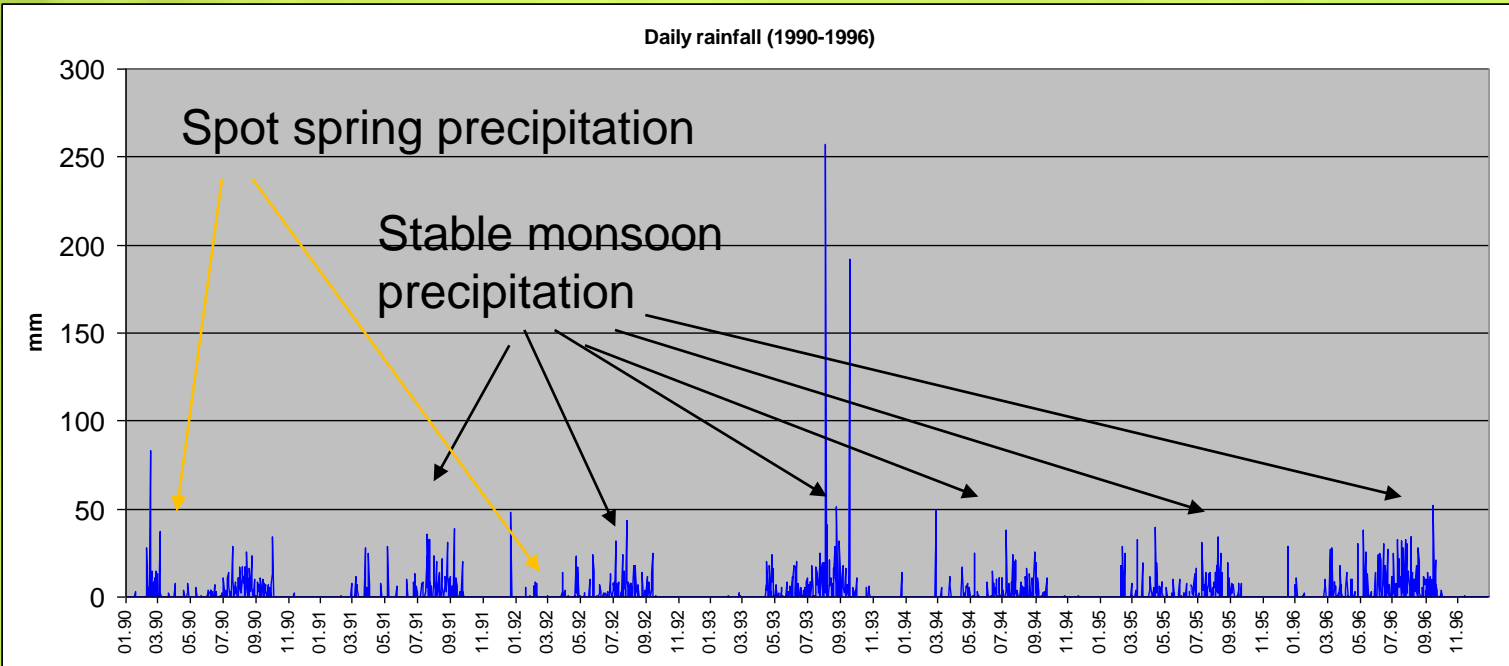
- SOIL WATER

- NUTRIENTS

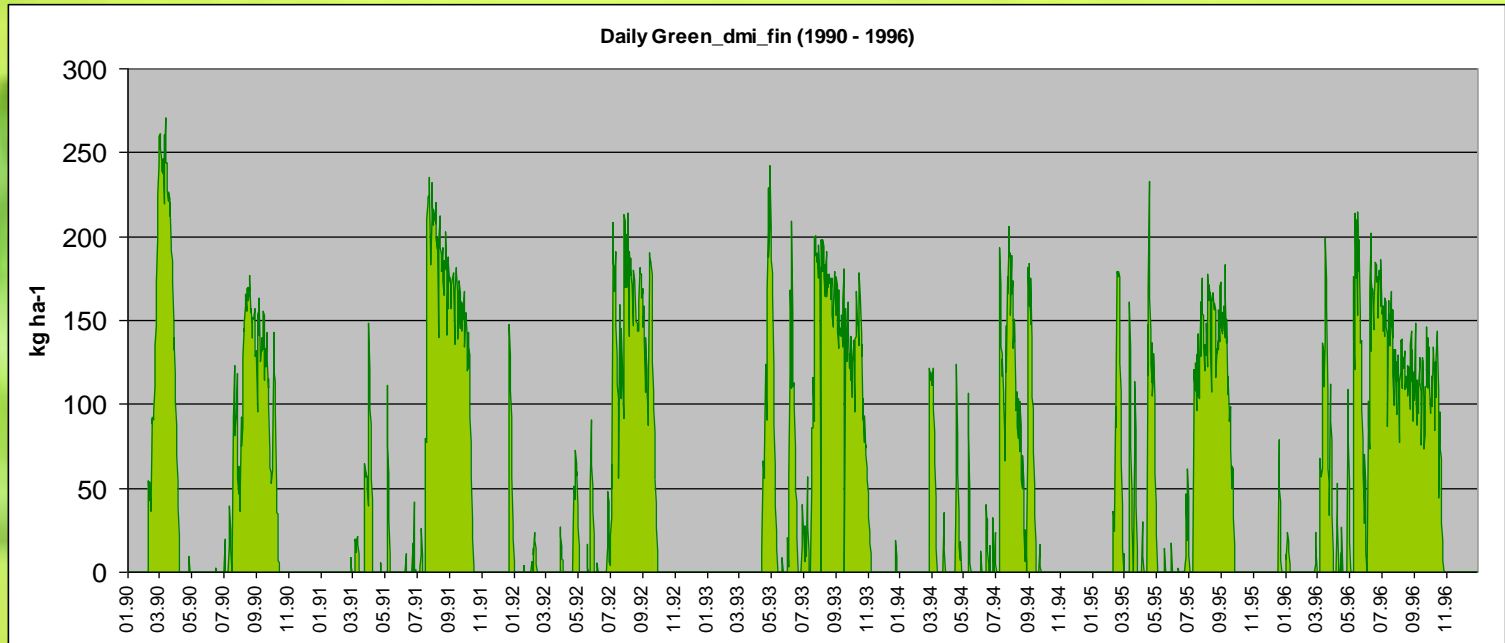
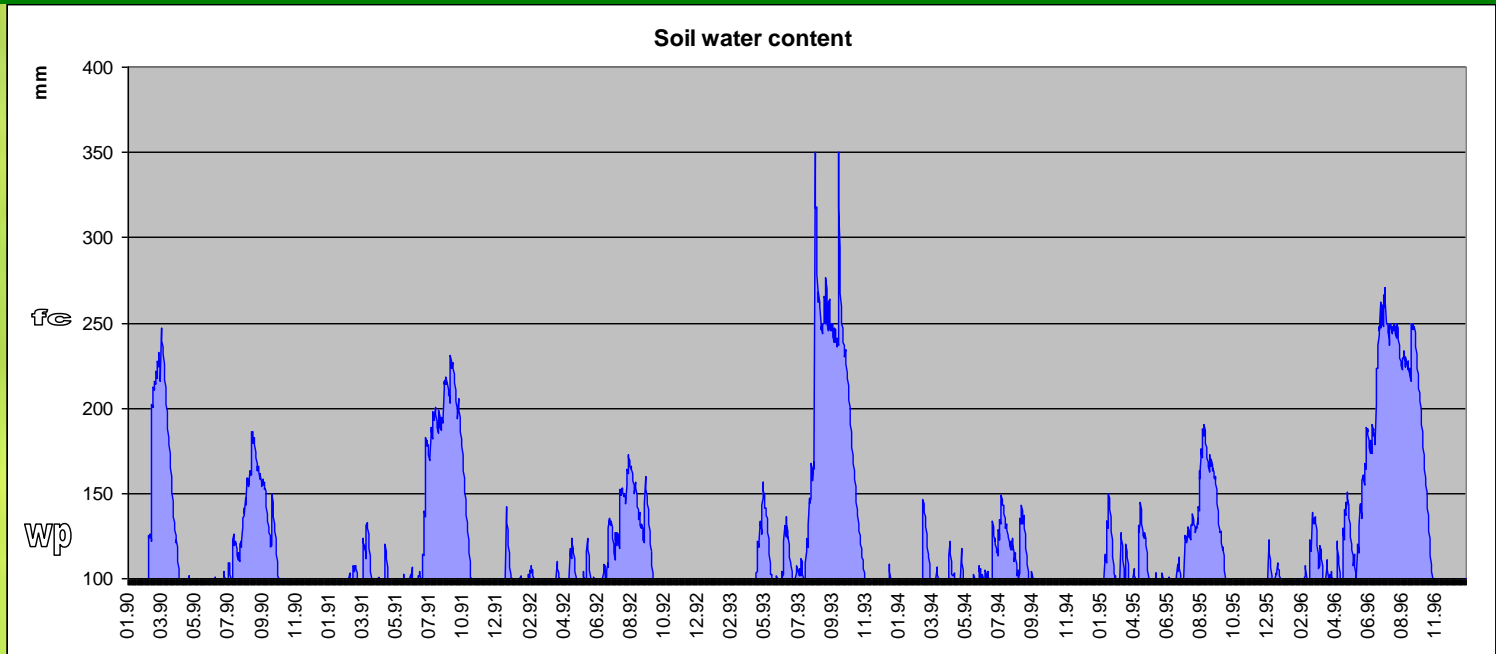
# Radiative and Thermal res.



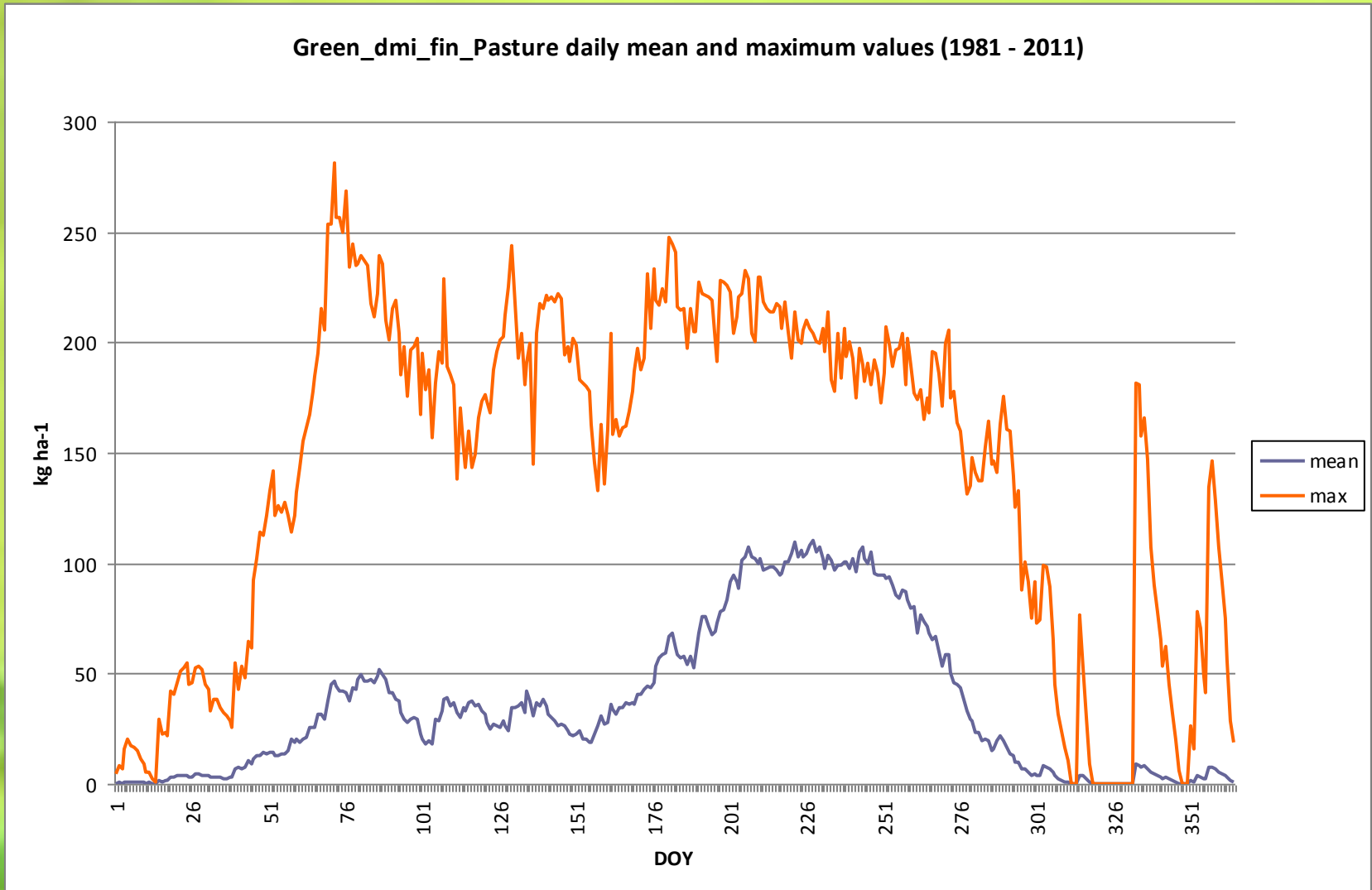
# Rainfall and Water res.



# Water res. and Daily Production



# Mean and maximum daily production (21 years)





# Model validation literature

- Lack of observational data on pasture production

- Literature on experimentation near Addis Abeba

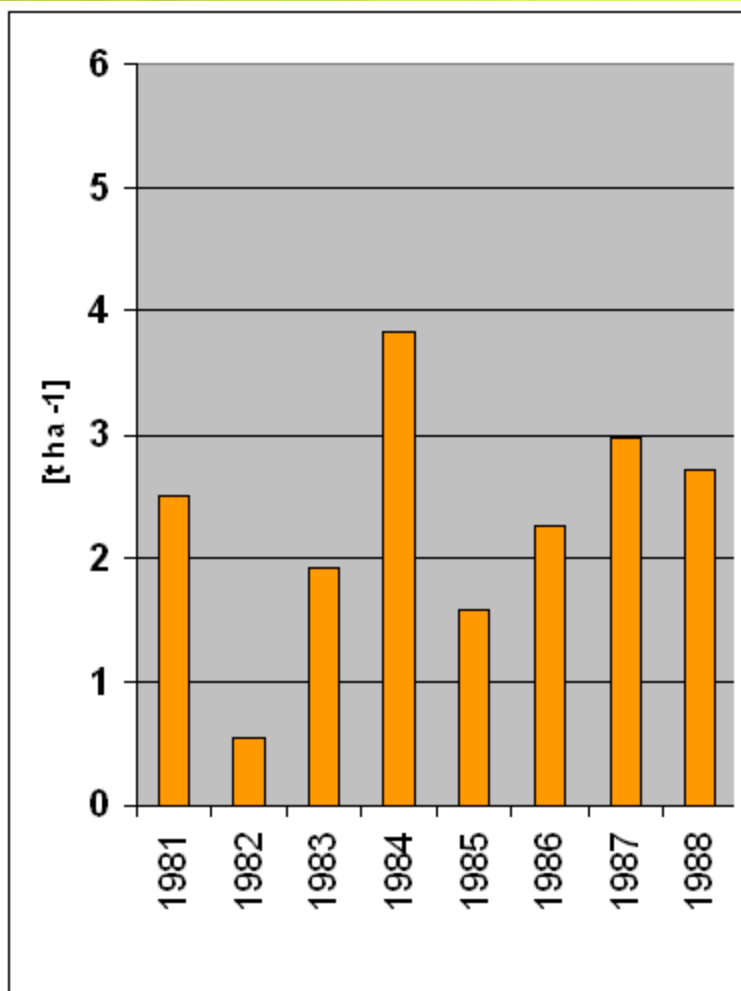
-Girma Taddesse, Don Peden, Astatke Abiye, and Ayaleneh Wagnew  
Effect of Manure on Grazing Lands in Ethiopia, East African Highlands  
Mountain Research and Development Vol 23 No 2 May 2003: 156–160

-Mwendera E.J. , Saleem Mohamed M.A., Tadesse A. Biomass  
Requirements from natural pastures for livestock grazing and soil  
protection in the eastern african highlands. Report 1999

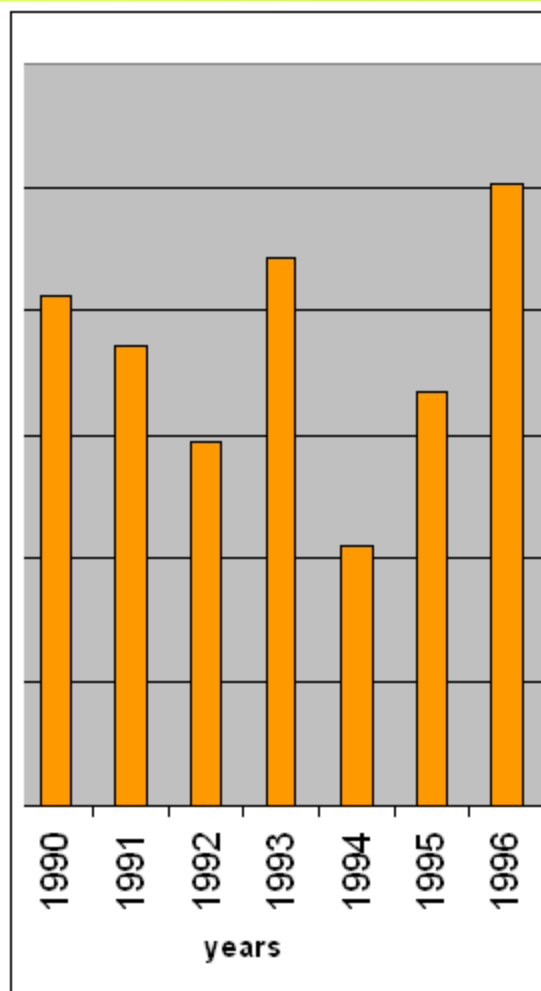
Zewdu T. Identification of indigenous pasture and the effect of time of  
harvesting and nitrogen fertilizer in the northwestern Ethiopian  
Highlands. *Trop. Sci.* 2005, 45, 28–32

t ha <sup>-1</sup>	Mwendera et al.	Taddesse et al.	Zewdu et al.
<b>Average</b>	<b>4.7</b>	<b>3.6</b>	<b>4.2</b>
<b>Max</b>	<b>6.2</b>	<b>3.9</b>	<b>6.3</b>
<b>Min</b>	<b>1.6</b>	<b>3.4</b>	<b>3.2</b>

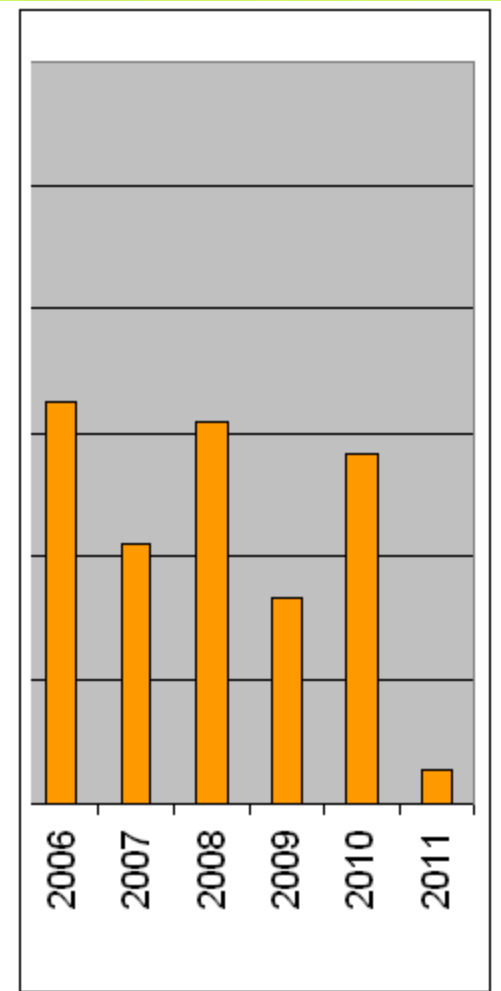
# Final biomass production



mean	St dev
2.29	0.98



mean	St dev
3.66	0.98



mean	St dev
2.19	1.12



# Conclusions

- Environment with great rainfall variability and temperature stability
- Key limiting factors: water and nutritional, justifying final production interannual variability
- Generally low productivity (2.7 t DM ha<sup>-1</sup>)  
During periods of water availability, Nitrogen supply could provide relevant increases in productivity

# Future improvements

- Meteorological data retrieval from National Meteorology Agency (ETHIOMET)
- Field sampling of biomass production for model calibration and validation

.....THE END

