

Climate change and population growth in pastoral communities

**Towards middle and high income for the
people in the Ngorongoro District, Tanzania**

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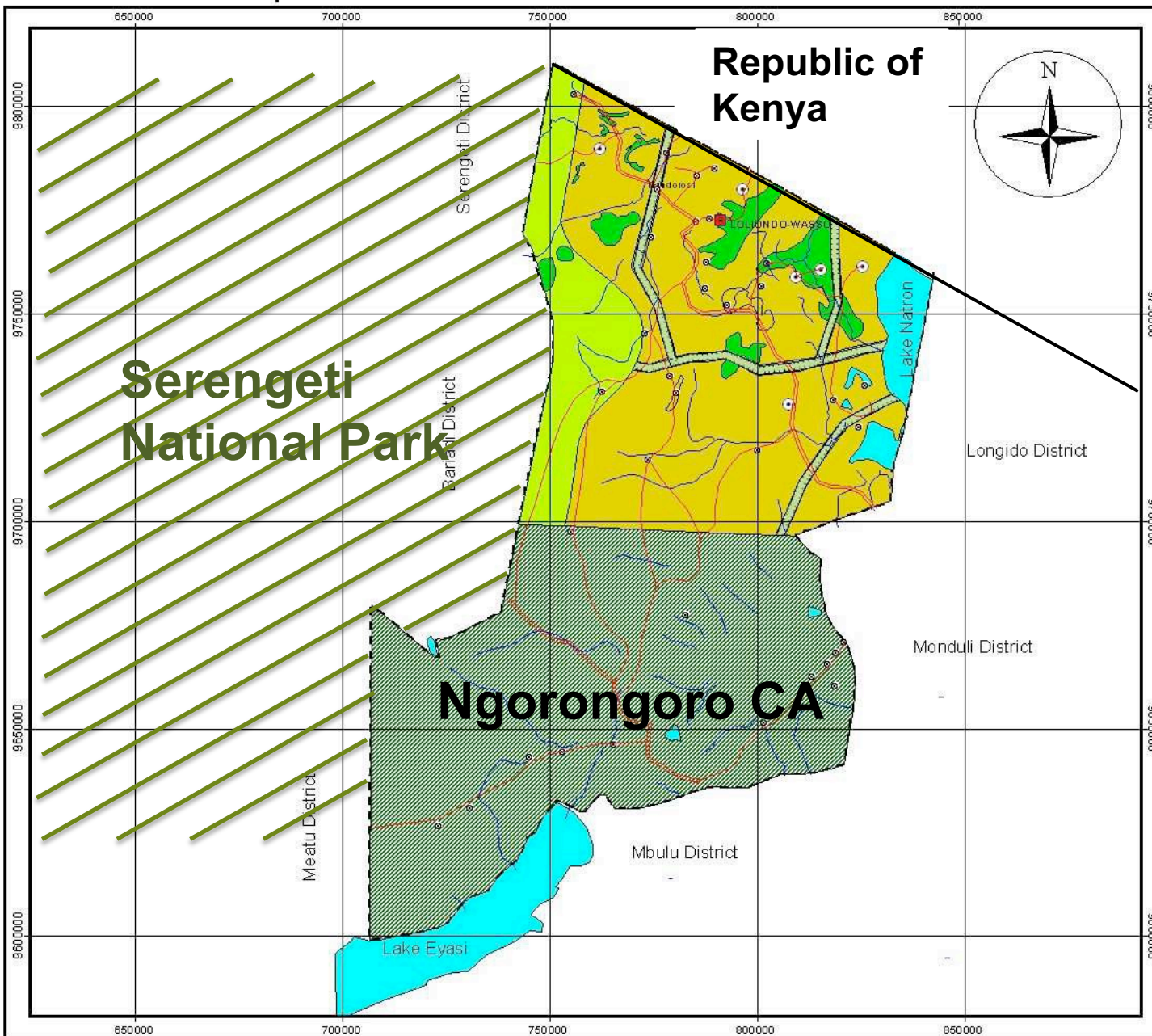
**Ngorongoro
District**



Ngorongoro District (ND)

- **Area: 14,036 km²**
- **Population: 200 000 (2016), 80% Maasai**
- **Economy based on pastoral livestock keeping**
- **Loliondo: administrative center of Ngorongoro District**
- **8 hours drive to Arusha**

Map No.9: EXISTING LAND USE - NGORONGORO DISTRICT



LEGEND

- Loliondo/Wasso District (HQ)
- ◉ Trading Centre
- Village
- International Boundary
- District Boundary
- Division boundary
- Trunk road
- District road
- River
- Forest
- ▨ Ngorongoro Conservation Area Authority
- Agriculture and Settlement
- Game Controlled Area
- ▨ Wildlife Corridor
- Water body and Wetland

20 0 20 40 Kilometers

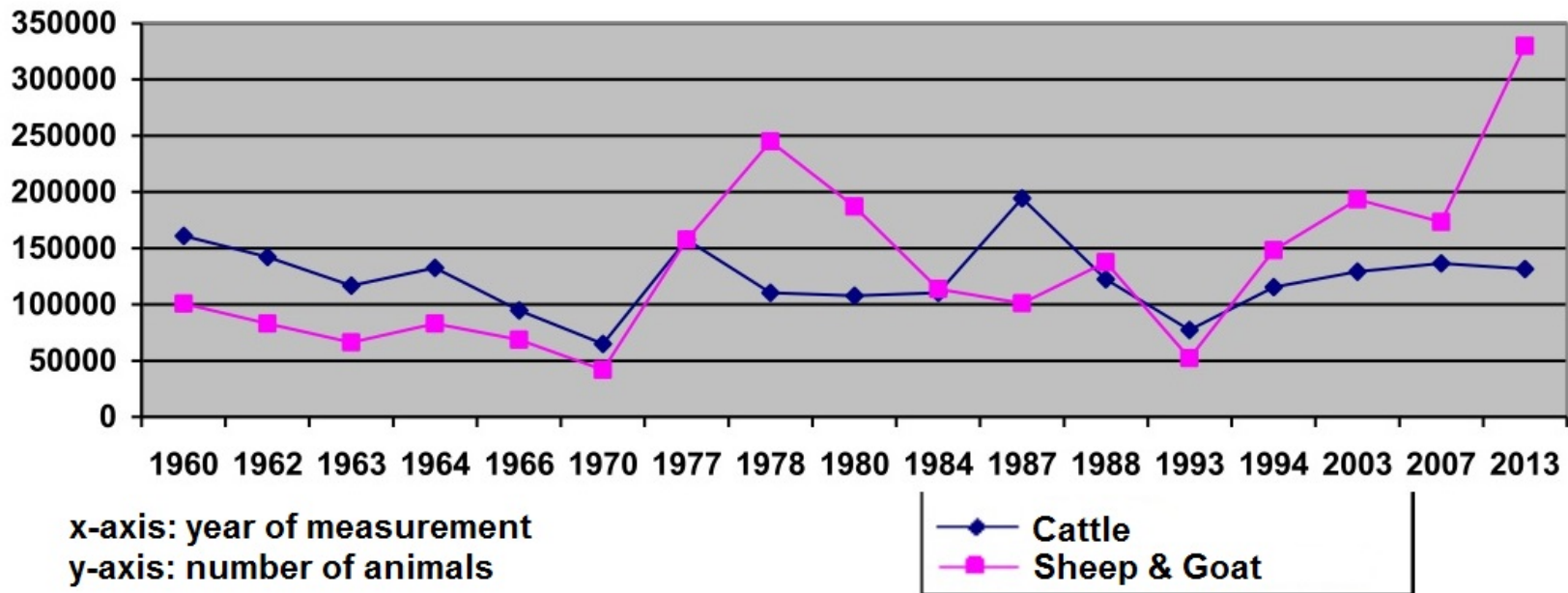


Human Population & Wealth

	Ngorongoro	LU/p
year	population	430,000
1960	20,000	21.5
1978	47,000	9.1
1988	69,000	6.2
2002	129,000	3.3
2012	174,000	2.5
2016	196,000	2.2
2036	356,000	1.2



Livestock changes in the Ngorongoro Conservation Area 1960-2013





People - livestock and wealth

- Pastoral household needs 4 livestock units per household member to be sustainable
- Since the nineties pastoralism not sustainable in Ngorongoro District
- Economic diversification is urgently needed



Current climate change projects and strategies

- For poor people to survive
- Mitigation for poor people to reduce causes
- Adaptation for poor people to prepare for the effects
- Strongly based in poverty reduction strategies



Climate Change & Poverty reduction strategies

- Livestock restocking for poor households
- Small scale milk processing by women groups
- Poultry promotion
- Introduction of modern man-made beehives
- Community-led sustainable forestry
- Leather and beads crafts training
- Microcredit and village community banks
- Micro enterprise / small entrepreneurs support



Climate Change & Poverty reduction strategies

- Small irrigation projects
- Rehabilitation and adding drinking-water sources for human and animal need
- Small solar/wind/water/bio-gas energy installations
- Improvement of feeder roads
- Small food processing (milling corn, packing sunflower, processing groundnuts, etc.)
- Kitchen gardening



Poverty reduction strategies ERETO in NCA 1998 - 2008

- 3,400 poor households in 1994
- Restocking with 30,600 LU's
- All water resources rehabilitated and new constructed
- Veterinary services made accessible for all



Results on poverty reduction in Ngorongoro Conservation Area

Wealth classification NCA 1994-2013				
	HH 1994	%	HH 2013	%
Destitute	3,400	37%	10,500	52.4%
Wealthy	2,000	22%	2,000	10.2%
Total	9,200		20,000	



How to escape poverty when population growths and climate changes?

Economic diversification must lead to income growth

	Status	Gross National Income per capita per year
1	Low income	under US\$ 1,035
2	Lower middle income	US\$ 1,036 – US\$ 4,085
3	Higher middle income	US\$ 4,086 – US\$ 12,615
4	High income	above US\$ 12,615



Economic development Targets for Ngorongoro District

	Status	Economic growth rate per year	Gross District Income per capita per year
1	2016 : Low income	6.7%	under US\$ 900
2	2026 : Lower middle income	6.7%	US\$ 1,259
3	2036 : Middle income	5.9%	US\$ 1,871
4	2056 : Higher middle income	5.4%	US\$ 3,652
5	2100 : High income	5.4%	above US\$ 12,615



Reduction role livestock herding when improving wealth

year	population	LU/p	Livestock sector	Other sector	Income status
2016	196,000	2.2	166,000	30,000	Poor
2026	264,000	4	100,000	164,000	Lower middle
2036	356,000	6	66,667	289,333	middle



Diversification and Concentration

- Population and economy concentrated on 4,256 km²
- From 28 person per km² in 2016 to 75 in 2036
- Livestock keeping + livestock processing 100,000 people
- Other agriculture + food processing & marketing 100,000 people
- Tourism and hospitality industry 100,000 people
- Forestry and wood processing 20,000 people
- Mining and related 20,000 people
- Energy and related 16,000 people



Towards Climate Resilient Livestock Sector

- Livestock from “banking” livestock to commercial livestock keeping
- Reducing numbers livestock to prevent drought effects
- Increasing kg's sold
- Improving breeds
- Improving markets
- From 166,000 people now in livestock keeping 2.2 LU per person
- To 100,000 people in livestock keeping 4 LU per person in 2026



Commercial Cattle Keeper Household Economy 2026

Number of cows per bull	44	
Average productive life of a cow	13.5	Year
Average productive life of a bull	3.5	Year
Number of calves weaned per cow	0.75	
Number herd size (cows and bulls)	20	
Number of calves sold per year	14	
Average value of calves at 9 month	1,000,000	TZS
Days of feeding	150	days
Costs of feeding per day per animal	2,200	TZS
Concentrates and forages per animal	330,000	TZS
Days of free grazing	215	days
Vet services, taxes, vaccination, registration per animal	100,000	TZS
Average household size	5	persons
Target turnover per person	1,259	US\$
Target turnover per household	6,295	US\$
Household sales of calves	14,000,000	TZS
Realised contribution to Gross National Income	6,364	US\$
Gross Income per person per day	3.5	US\$
Costs feeding per year	6,600,000	TZS
Other costs per year	2,000,000	TZS
Remaining for household expenses	5,400,000	TZS
Net income per person per year	1,080,000	TZS
Net income per person per day	2,959	TZS



Towards Climate Resilient Tourism

- From 60,000 tourist nights to 1,200,000 tourist nights in 10 year
- From high end – short stay to medium priced long stay
- From 644 rooms in 2016 to 6667 rooms in 2026
- From 1250 employees to 12,223 people in 2026
- Produce 72 Million \$ - up from 2.5 M now
- 22 % of needed District Gross Product
- Supporting 48,892 people = 18,5% of population
- Which is good for 50,000 depend of providing lodging
- With multiplier is 100,000 people depend of tourism



Value of wildlife is high compared to livestock!

Value of total population of wildlife & livestock in Ngamiland					
Species	Weight KG	KG of meat	Price per animal	Nagmiland Population	Population worth/USD
Elephants	3000	1500	\$6,750.00	126000	\$850,500,000.00
Buffalo	1000	500	\$2,250.00	53000	\$119,250,000.00
Zebra	220	110	\$495.00	62000	\$30,690,000.00
Wildebeest	190	95	\$427.50	13000	\$5,557,500.00
Kudu	170	85	\$382.50	5600	\$2,142,000.00
Impala	60	30	\$135.00	69000	\$9,315,000.00
Giraffe	700	350	\$1,575.00	5000	\$7,875,000.00
Eland	560	280	\$1,260.00	900	\$1,134,000.00
Lechwe	79	39.5	\$177.75	26000	\$4,621,500.00
Sheep/goats	100	50	\$91.00	124000	\$11,284,000.00
Cattle	900	450	\$819.00	420000	\$343,980,000.00
Total wildlife value				122000	\$1,031,085,000.00
Total livestock value				122000	\$355,264,000.00
Value of 1 wildlife share					\$8,451.52
Value of 1 livestock share					\$2,912.00



Towards sustainable wild life protection

- See wildlife as a source of income:
- Value of Wildlife is ~3 x value of Livestock per kg meat
- Grow in wildlife farms or in game reserves
- Attraction for visitors
- Meat for sale legally – for visitors and for populations
- Combat poaching
- Make profit from tourist and local hunting
- While maintaining healthy wildlife numbers and variety



Conclusion

- Focus on “climate proof” economy and poverty reduction
 - Leads to more poverty
 - At best keeping people alive
- Policy needs to be “population proof” economic growth
- Goal is middle and high income
- Taking effects of climate change into account
- Utilise all options to
- Diversify the economy to
- Provide work and income to everybody