

“Move child, move!”¹

Towards Middle and High Income for the People of the Ngorongoro District

Sef Sloomweg, GIZ/NRM Tanzania, Ngorongoro District Council, Loliondo, Tanzania
sefsloomweg@gmail.com +255 743 440 443 jozef.sloomweg@giz.de

1 November 2016

Abstract

The Ngorongoro District is part of the Serengeti Ecosystem. It witnessed a human population growth from approximately 25,000 in the early sixties to 200,000 people in 2016, predominantly pastoralist Maasai. Pastoralism as we know it today can be combined with photo tourism and game hunting activities for only 35,000 to 40,000 people in the Ngorongoro Conservation Area and the area bordering the Serengeti Park; together 70% of the district surface. For at this moment some 160,000 people growing to nearly 1.4 million at the end of the century, economic alternatives need to be created in the remaining 30% of the district territory. Diversification and intensification of tourism, livestock and agriculture, forestry, mining and using the sustainable energy potential of the area can create economic growth rates of 5.4 to 6.7%. These are needed to achieve middle income status between 2037 and 2057 and high income status by the end of the century. Today the revenues of tourism and mining escape the district population and the other sectors are underdeveloped. The district needs social responsible companies and investors who want to maintain high environmental standards to prevent rapid exhaustion and exploitation of the nature and its population.

Introduction

The Ngorongoro District (14,036 km² or 1.5% of Tanzania territory) is situated in the North-East of Tanzania and is part of the Serengeti Ecosystem. The district borders the Serengeti National Park in the West, Kenya to the North and Lake Natron to the East. The Ngorongoro District is part of the Arusha Region in the South. It has a population of mainly pastoralist Maasai (80%) agro-pastoralist Batemi (11%) and 9% other tribes. The district has no good road infrastructure, unsuitable for normal cars and has no formal direct connection to Kenya. It is a “remote area”, at 320 km to Arusha, as nearest city taking between 6 and 10 hours by four wheel drive car, bus or truck. In the

¹ Is the answer of the mother to the question of the young millipede: “with so many legs, which leg or legs do I move first?” Mwalimu Julius Nyerere explains July 20, 1964: We must not ask ourselves whether we should wait until we are all ready to move.

rain season travel to parts of the district might be completely impossible. The district is administratively divided in three divisions. The quasi total of the Loliondo and the Sale divisions make up the Loliondo Game Controlled Area (see Map 1). Around Lake Natron is the Natron Game Controlled Area. The third is the Ngorongoro division, entirely the Ngorongoro Conservation Area (NCA), including the world-famous Ngorongoro Crater. The particularity of the NCA is that pastoralism is allowed next to photographic tourism which is rare for a conservation area.

Map No 1: Ngorongoro District Protected Areas



(Source: Sakanda, 2013)

This paper aims to address the economic development options for the district population, taking into account the strategic importance of the Ngorongoro Conservation Area (NCA) and the Serengeti National Park for wild life conservation and as a habitat for traditional Maasai Pastoralists. The first section deals with the human population development from the early 1960's to the end of the 21st century and its effect on pastoralism. The second section deals with the question how and where pastoralism can be maintained in the district. It will give an estimation of the number of people it might provide a minimal income sufficient to survive under primitive living conditions. The third

section describes the possible future population division in the district. The fourth section gives an overview of the development goals for the district described by Gross District Income per capita and sketches three different development scenario's: a scenario of the hope; one which is presented as very ambitious but realistic and one in which the district chooses an all-pastoralist option. The fifth section sketches how the realistic scenario can be made possible, which is concretised in the sixth section. The seventh and last section shows what is needed from the district administration and its political and social leaders to make it happen.

1. Human population growth and its effect on pastoralism

This section pays attention to past population growth figures and presents long term projections for Ngorongoro Conservation Area (NCA), Ngorongoro District and Tanzania from the 1960's to end of 21st century. These human growth figures are compared with the livestock development. Pastoralism is the main livelihood for today Ngorongoro District population. The main problem arising from this comparison is: the human population is growing very fast, while the carrying capacity of the area does not allow a growth of the livestock population. In this section we look first to the NCA and then to the district as a whole.

Ngorongoro Conservation Area

The NCA was created in 1959 and had a human population under 10,000 in the early sixties, which grew to almost 100,000 people in 2016; the population has ten folded in fifty years. The NCA is a conservation area, where besides photo tourism only pure pastoralism is allowed. The population may not construct permanent buildings and crop-growing and gardening is forbidden.

Table 1: Human population and livestock changes in NCA#

year	nr of years	population	increase	annual growth rate
1966		8,728		
1978	12	17,982	9,254	6.210%
1994	16	42,508	24,526	5.524%
2002	8	56,856	14,348	3.702%
2013	11	87,851	30,995	4.035%
2016	3	98,920	11,069	4.035%

Year	Livestock Unit
1960	175,418
1962	154,104
1964	144,344
1966	104,379
1968	113,739
1970*	70,747
1974	146,119
1978	134,550
1980	139,026

#Human population figures 1966 and 1978 as well as Livestock Units are calculated from Århem, 1985; 1994 and 2002 are from ERETO project; 2013 and 2016 are calculations based on NCAA/NDC sources

*The figures for 1970 are not reliable

The livestock figures between 1960 and 1980 on the other hand remained stable, fluctuating with the rain conditions over the years around 130,000² Livestock Units³ (LU). This means that from a

² The average using the figures from the table 1 is 131,381 LU. When indeed 1970 figures are not included the average is 139,960 LU, see more remarks on this issue in the next section.

³ The figure of 130,000 can be disputed. It is based on Århem 1985, p. 47. Only I reworked them in LU based on 7 small stock gives 1 cattle, which was observed in studies which provided later figures (ERETO). The figure of 130.000 is an average over the years, with the

rather wealthy situation in the sixties of last century the population in NCA impoverished severely, from on average 13 LU per head of population to 1.3 LU per head today. A generally accepted wealth measurement for pastoralists indicates that a family of 4-5 persons needs at least 20 LU to sustain itself. This family is not considered “poor” as they can feed the family and send the children to school, but they will live in rather primitive conditions.

Ngorongoro District

For the Ngorongoro district as a whole the situation is comparable but less destitute because the population has other options than livestock herding. The 47,000 people back in 1978 have grown into 196,000 in 2016. The number of LU’s is calculated at 430,000⁴ in 2010. This number of 430,000 LU’s can be considered the maximum carrying capacity for the district under pastoralist conditions. According to unpublished district estimations, the number of livestock units has gone above the 500,000 LU’s in 2016. Which would mean an average of 2.55 per person in 2016, or some 10 LU per family of 4 persons or half the number for maintaining a sustainable livelihood under primitive conditions. The Draft District Land Use Framework Plan 2010-2030 (p 58) expects the number of LU’s to grow to 588,000 LU’s in 2030. But for decennia one complains about overgrazing, destruction of the grasses and reducing the regeneration capacity of the land, bush encroachment, and changing of dry season grazing area into crop growing land and settlements which all lead to a reduction of the land suited for livestock grazing. These high numbers are therefore not sustainable and may be even impossible.

Table 2: Ngorongoro District Population Trend

Year *	population	growth rate
1978	47,031	3.92%
1988	69,107	4.58%
2002	129,362	3.03%
2012	174,278	3.03%
2016	196,338	3.03%
2036	356,333	2.50%
2056	586,883	2.00%
2100	1,402,684	2.00%

* Figures 1978 – 2012 are census data, 2016 and further are calculations with indicated yearly growth rates estimates.

When looking to the future human population development we expect for Ngorongoro district in 2037 some 356,000 people and at the end of the century, when we calculate with a reduced growth rate (down from 3.03% now to 2.5% from 2036 and 2.0% after 2056), Ngorongoro District will have some 1.4 Million people. The average number of LU’s per capita would go further down from 2.19 today to 1.2 in 2036 and end of century to 0.3 LU per capita. This all under the condition that

assumption that the observation correct is that the maximum number oscillates around this average. Elsewhere Århem gave 102,000 standard Livestock Units as optimal stocking capacity of the NCA, while he calculates that the actual domestic stocking rate converted into SLU in 1980 was 84,000 units as compared to 87,000 in 1961. Here the SLU is calculated by Århem with a method developed by Coe et al. (Århem 1985: p.52). His conclusion though is clear: “the fluctuations in the livestock populations (...) appear as oscillations around the optimal stocking rate for the area” (see Århem, 1986: p. 52).

⁴ Draft District Land Use Framework Plan 2010-2030, p 28 calculates 428,125 LU’s as current (2010) number of livestock and defines this as the carrying capacity.

livestock would be kept under the maximum of 430,000 LU's. This in fact is impossible. Pastoralism as it is today cannot be maintained in areas with this increasing population density.

The natural population growth due to continuing high birth-rates and reducing death rates, combined with the migration patterns, contribute to the high population increase over the last decades. This has led to an increase in the number of settlements, especially in the areas that were used for grazing in the dry season. Especially these areas are favourable for agriculture. And exactly this development makes traditional grazing patterns for pastoralists more and more difficult. As Sakanda (2013, p. VI) found in his research in the Loliondo division, the answer of pastoralists to the population increase and the subsequent decrease of LU's per family has been income diversification. The human population (which is 80% pastoralist Maasai) relies more and more on agriculture, petty trade and services to the hospitality industry (Tourism), and on the use of forest products (logging, charcoal production and beekeeping) and mining⁵. We see more and more Maasai live in stone permanent housing; they rely on urban services from Loliondo, Wasso, Ololosokwan, Engaraseo and other once rural villages, and the same happens with the settlements in the NCA. The population of the NCA can no longer be seen as the idyllic Pastoral Man in the Garden of Eden as Århem saw them in the late seventies of last century. Villages have urban services, and houses and constructions are from stone. Hotels, Lodges and Camps have encroached the countryside attracting workers, housing for staff and providing development support to the communities around. The 1 million tourists who visit the NCA each year attract small business and hawkers. The tourists are looking for cultural touristic events, and they like to buy traditional clothing, shoes and leather, jewellery, and even food.

Therefore we can conclude the growing population pressure effects not only growing use of land for agriculture, but also growing use for trade and urban services, growing deforestation and a growing use for tourist related activities. Upcoming mining in the district further reduces the land open for pastoralism.

2. How and where to preserve pastoralism and for how many people?

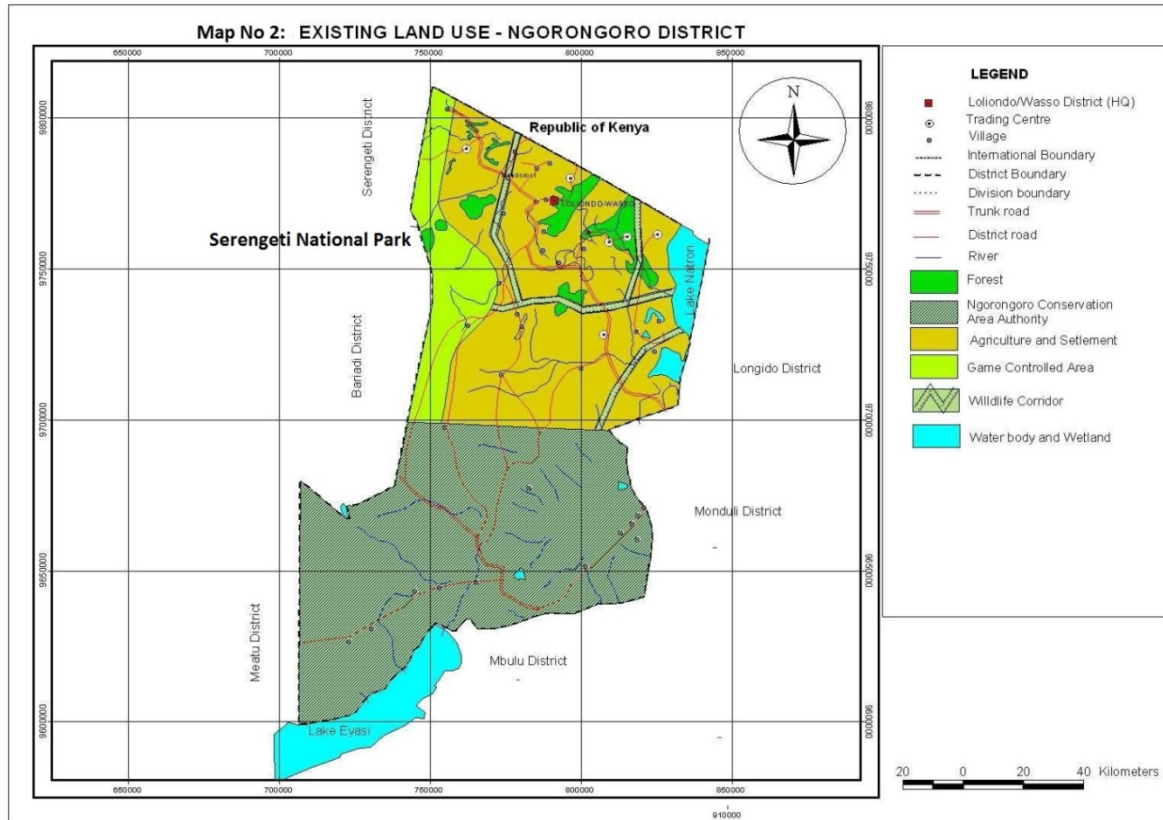
This population pressure related to the survival strategies of the Maasai raises the question how and where pastoralism can be preserved and for how many people. This section will try to find an answer to this question.

The total surface of Ngorongoro district is 14,036 km² of which 59% (8,289 km²) is Ngorongoro Conservation Area. In this area the average n° of LU that can be maintained is around 130,000 LU. When we keep the minimum n° of cattle per head of population at 4 LU's⁶ for a sustainable pastoralist livelihood, this means in the NCA a maximum of 32,500 people can live as pastoralists. When these people can also profit from extra income from tourist related activities this will provide

⁵ Traders come to Loliondo and Wasso to upload truckloads of mineral stones which are delved by Maasai, in Arusha one can observe hundreds of Maasai everyday walking around with precious stones for trading.

⁶ This figure poses another problem, the one of livestock per family. At the moment it is said that 80% of the livestock is owned/controlled by 20% of the population, leaving 20% of the livestock for the 80% of the rest. Whatever the figure is, unequal distribution over livestock herding population places many households in very poor even destitute conditions.

them with an income enough for food, education and health services and the currently practiced free food distribution policy⁷ could be abolished. Seen the current level of almost 100,000 and the impossibility for income diversification other than related to (cultural) tourism, over 65,000 people should find this income diversification outside of NCA.



Under discussion is at the moment a proposal to make 1500 km² bordering the Serengeti Park to be strictly game protected area (see Map Nr. 2) or game reserve, where no human activities are allowed other than (controlled) hunting and photographic tourism⁸ but no boma's, stone constructions or settlements and no livestock herding. Even when pastoralist activities will continue to be allowed as is the case in NCA, the n° of cattle possible in this area most likely cannot be more than the level of the NCA, taking the difference in surface into consideration, which is less than 20% of 130,000 LU's or 23,500 LU's. This number of LU's would allow a minimally sufficient income for no more than 5,800 people. If we assume that apart of hunting also photographic tourism will be allowed with related services from Hotels, Lodges and Camps, this low income can be improved with tourism related services and petty trade.

The conclusion must be that from a total of 14,036 km² some 9,780 km² is reserved for wildlife and a maximum of 38,300 pastoralists. This leaves 4,256 km² for the remaining 157,700 people which

⁷ Today every person living in NCA is provided with a certain number of bags of maize and other food supplements a year. This was done because the population was deprived of the possibility to grow crops. But another effect of this free food policy has been a growing immigration to the area.

⁸ This proposal appeared in the Draft District Land-Use Framework Plan 2010-2030 and is coming back ever since, and is related to the discussion about the outdated status of practically all of Loliendo and Sale division as game protected area as established in the early sixties. This outdated status does not reflect the reality of today.

make a population density of some 37 people per km². But it means as well a relocation of 66,420 people from NCA and some 24,900 people from the proposed Game Reserve (see Table 3).

3. Towards a new human population divide over the Ngorongoro District

It is realistic to expect the population growth in the district to continue with 3.025% per annum (at the same rate as now up till 2036), to slow down to 2.5% per annum and further slowing down to 2% as from 2056 up till end of the century. This is realistic as we can expect that health services and living conditions will improve which will reduce the death rate, while due to economic progress and improved health education, the birth-rates will fall. When we further assume that the number of pastoralist people in NCA and the Game reserve can effectively kept stable at a total of 38,300 people, this will lead to the following division of population growth in the different areas:

Table 3: Human population trend 2012-2100 Ngorongoro District

	Surface In km	% of surface	Population					
			2012*	2016*	2016#	2036#	2056#	2100#
Ngorongoro	14,036	100%	174,278	196,000	196,000	356,000	587,000	1,403,000
NCA	8,280	59%	87,851	98,920	32,500	32,500	32,500	32,500
OBC Game Res.	1,500	11%	27,251	30,701	5,800	5,800	5,800	5,800
Loliondo+Sale	4,256	30%	104,572	117,811	157,700	317,700	548,700	1,364,700

* Figures from Ngorongoro District and Loliondo+Sale are based on the 2012 population census. Figures from NCA are based on a special count done in 2012/13 and estimations in 2016 made by NDC/NCAA. The figures for OBC Game reserve are based on a calculation of the surface of the game reserve related to the total of Loliondo and Sale Division.

Figures are based on the assumption that effectively the population in NCA and the OBC Game reserve can be brought back to 32,500 and 5,800 respectively which is the maximum number of pastoralists when we count 4 LU per capita as minimum.

When we translate these population figures in population per km² we get the following overview:

Table 4: Human population projections per square km in Ngorongoro District

		2012	2016	2016	2036	2056	2100
	km ²	p/km ²	p/km ²	p/km ²	p/km ²	p/km ²	p/km ²
Tanzania	947,303	62					499*
Ngorongoro District	14,036	12	14	14	25	42	100
NCA	8,280	11	12	4	4	4	4
OBC Game Res.	1,500	18	20	4	4	4	4
Loliondo+Sale	4,256	25	28	37	75	129	321
Netherlands	41,526		411				

* Projection for Tanzania, Ngorongoro and Loliondo/Sale are based on 3.025% growth till 2036, then 2.5% till 2056 and further growth till end of century of 2%.

The aim to reduce the number of inhabitants of NCA and the Game Controlled Area near the Serengeti cannot be achieved by a stroke of the pen. People go where they expect to escape from poverty, where they expect better chances for themselves and their children. Every policy aiming to reduce the number of people in certain protected areas can only succeed when real economic

alternatives are offered outside the areas that one want to protect from human overpopulation. The current situation is in effect having a reverse effect: tourism activities inside the NCA and the areas around the Serengeti have in fact attracted people to these areas.

4. Development Goals and Income Status for the Ngorongoro District

Tanzania has development goals. One of these goals is to reach middle income status by 2025. In order to understand what this means, here is the official World Bank classification⁹:

Table 5: World Bank Income Status Classification

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

Source: UN: World Economic Situation and Prospects 2014, p. 144

Currently Tanzania is rated at \$ 910¹⁰. Which would mean a growth from \$ 910 per head per year (average yearly household income of around \$ 3,600) to \$ 1,035 per person (or some \$ 4,100 per household of 4). In order to achieve this, a growth rate of the national income of 1.33% on top of the (national) population growth rate of 3.3% which is a yearly growth rate of 4.63% is needed, which is possible, even if we correct for inflation.

The Gross Ngorongoro Income per person is not known but we can assume this is below the 910\$ as has been calculated for the country, especially when we do not calculate tourism income as Ngorongoro income. Because practically most tourism revenues leave Ngorongoro District¹¹. Tourism revenues that remain in Ngorongoro are district gate fees, limited hotel and accommodation revenues, income from people in the district working for lodges, hotels and camps, and money spend by these camps in buying locally, which is fairly limited. When shopping is done it is either from Kenya or other countries, or in Arusha or Karatu which is not Ngorongoro. The contribution from lodges, camps and hotels and from NCA to the District budget (in fees, levies, etc.) is still under negotiation¹². Through the MoUs¹³ with communities and through the charities that

⁹ What are we talking about? This classification is used by World Bank and others to rate countries based on the GNI (Gross National Income) calculated per capita of the total population. Tanzania is currently rated at some \$ 910 per head of the population. Does this mean that on average, a Tanzanian household of 4 persons will earn \$ 3600 per year (or nearly 10 \$ per day)? No, it means that what is earned as a total in the country by people, companies and by government and non-government institutions is on average per person \$ 910 per year.

¹⁰ Worldbank: Gross National Income per capita 2015, Atlas methodology and PPP. Tanzania mainland only.

¹¹ An average European tourist spends excluding flight between \$250 and \$650 per day on 6-13 days holiday in Tanzania. He will spend on average 2, max 3 nights in Ngorongoro District. We estimate some \$50 to \$75 per day remains in the district.

¹² There is still no agreement between Ngorongoro Conservation Area Authority and the district about its contribution to the district budget and the tourist sector is still fighting in court about the service levy of 0.3% of the business turnover they are expected to contribute to the district budget.

most hotels, lodges and camps and hunting companies have, they contribute to development projects in communities where they operate. These projects may be the biggest contribution to development and to the Gross District Income from Tourism, bigger than the other contributions (salaries, shopping, and fees). We can only conclude that currently tourism has a limited contribution of maximum 20% of yearly turnover¹⁴ that contributes to the Gross District Income, the remaining 80% goes to national authorities and company expenses outside the district.

From the analyses above we should conclude that even when we maintain pastoralism in NCA and the proposed game controlled area near Serengeti, this can give a minimal income to only 38,300 persons. The rest of the district of 4,256 km² will have to provide the food and the income for an ever growing number of people up to possibly some 1.4 million people at the end of the century, which equals a population density of 321 persons per square km in that part.

The challenge is how to bring the ever growing population first to lower middle income, then to higher middle income and eventually to high income at the end of the century. Let's suppose we look beyond 2025. Tanzania will want to achieve higher middle income status in 20 or 40 year which is over \$ 4,000 GNI per person per year. Then in the end of the century we suppose Tanzania wants to be high income country. The district has 84 years to achieve this goal; therefore it should not be impossible to have an average GNI per capita of 12,500 or more in 2100¹⁵. Table 6 projects these milestones.

Table 6: Gross National Income projection, two scenario's for Tanzania

GNI/Capita*	2016	2025	2036	2056	2100
Tanzania Hope scenario	\$ 910	\$ 1,730	\$ 3,830	\$ 11,174	\$ 49,070
Economic Growth rate#	10.43%	10.43%	8.0%	5.42%	5.42%
Tanzania Realistic scenario	\$ 910	\$ 1,259	\$ 1,871	\$ 3,652	\$ 15,901
Economic Growth rate#	6.7%	6.7%	5.9%	5.4%	5.4%
Turkey	\$ 9,950				
Croatia:	\$ 12,700				
South Korea:	\$ 27,400				
Netherlands:	\$ 48,900				
*GNI/capita in US\$ Atlas Method WB					
#the needed economic growth rate is calculated as: needed economic growth = population growth rate plus net economic growth needed for real growth per capita. Note effect of Inflation is not included in the calculations!					

Hope scenario

A very ambitious scenario for the development of Tanzania would be to get in 2025 indeed lower middle income status of \$ 1,730, which would mean nearly a doubling of GNI in 10 years, possible with an economic growth rate of over 10% a year¹⁶. In order to come near higher middle income

¹³ Memorandum of Understanding, which is usually the way how the Tourist industry concludes agreements with the local community to assure the support of the local community for viable and profitable tourist activities. These agreements can lead to contributions as high as \$ 100,000 a year per village, plus another \$ 100,000 dollar a year for project support plus agreements on staff recruitment from the village.

¹⁴ The figure is based on a rough calculation for one of the lodges.

¹⁵ Just compare the changes that occurred in the world economy since 1930 until today!

¹⁶ Trading Economics website states that the average annual growth rate of the GNP of Tanzania over the last 10 years has been 6.7% with a maximum of 11.9% in 2007. See www.tradingeconomics.com/tanzania/gdp-growth-annual

status, like about \$ 3,840 per capita in 2036 we have to maintain this high growth rate for 20 years from now. In order to get close to high income status in 40 years, Tanzania needs to continue with an economic growth rate of 8% till 2056. If Tanzania at the end of the century wants to be as rich as the Netherlands is now in 2016, the growth rate needs to be 5.42% till the end of the century. These figures, although not impossible as China has shown over the last decades, seem however a bit over-ambitious for Tanzania.

Realistic Scenario

Another, possibly more realistic, scenario could be for the next 20 years a growth rate of 6.7% (which is equal to the average of the annual growth of the Tanzanian Gross National Product over the last 10 years) followed by a slowing down to 5.9% till 2056 and 5.4% till end of the century. This will lift Tanzania by 2025 to the lower middle income status with \$ 1,259 GNI/capita to \$ 1,871 in 2036, bringing the country to \$ 3652 which is near high middle income status in 2056, overhauling Turkey's current status by 2086 and pushing Tanzania to high income status by 2093 over the \$ 12,500 barrier. When we compare world development growth rates this seems realistic, although still very ambitious.

Whatever is the case, when we look at the current economic situation in the Ngorongoro District one thing is clear: a drastic change in the economic situation is required. Currently some 80% of the population is seen as pastoralist. In reality a pastoralist lifestyle is almost always combined with agriculture or petty-trade/craftwork and tourist related services.

The Keep-Ngorongoro-Pastoralist scenario

Pastoralist lifestyle is important and remains important in the NCA and in the areas around the NCA and the Serengeti Park to protect the animal migration. But what if the Ngorongoro District would opt for Pastoralism priority in the whole district? The carrying capacity for the Ngorongoro district as a whole is not more than 450,000 LU's¹⁷. This would give a maximum of 110,000 people a minimum existence level under primitive living conditions. Due to population pressure and related flight into agriculture of the Maasai, the carrying capacity for a pastoralist way of livestock keeping is being reduced from year to year. And in order to maintain this pastoralist way of life for the whole territory of Ngorongoro some 90,000 people should leave the district to build a life outside. Moreover, the urban lifestyle and services that are more and more common in the Maasai community and the agricultural production most people are used to, must be stopped, in order to give back the land to the pastoralists. Unnecessary to mention is that the tourism will die due to encroachment by livestock. Furthermore the population growth (every year 3,300 people) that is expected from the remaining 110,000 people in the district should make 825 families of 4 persons to leave the district every year.

A policy that would protect the pastoralist lifestyle for the whole district is impossible. A policy that would allow pastoralism in 70% of the district (NCA plus game controlled area) might succeed under the condition of high economic growth in the remaining 30%. Only then the overpopulation in the NCA and the proposed game protected area near the Serengeti Park can absorb the complete population growth of the district. This economic growth in Loliondo and Sale divisions will pull the

¹⁷ The Draft District Land Use Framework Plan 2010-2030, p. 56 said that for the expected 588,091 LU in 2030 is needed 1,470,228 Ha (or 14,702 km²) while the whole district has only 14,036 km².

human population out from the NCA and the game protected area which is quite different from a government chasing people out by force.

5. How to achieve middle income and high income status for Ngorongoro District?

This challenge, as has been said earlier, is to achieve within one or two generations (20-40 years) middle income status for the district and the country, resulting at the end of the century¹⁸ in high income status. Whether the district and the country will achieve a level of high income like the Netherlands (hope scenario) or Croatia (realistic scenario), both scenarios remain ambitious and need drastic action from now onwards to differentiate and improve the economic base of the district. The district is confronted with a population which is currently fast growing with 3% a year, only to slow down in one or two generations when economic developments will help the population to reduce the number of children per woman, like it has happened elsewhere in the world. Furthermore the district and its political and moral leaders have to understand the only option to maintain the culture and tradition of the Maasai Pastoralist lifestyle is to concentrate this in the protected areas of the district with a much lower population density as is the case in 2016. The differentiation of the economy should be concentrated in the Loliondo and Sale divisions. This makes the redirection of the overpopulation possible¹⁹ from the Ngorongoro Conservation Area and in the Game controlled area to the Loliondo and Sale divisions. The economic growth in these areas will make it possible to sustain a population pressure, rising from 25 persons per km² in 2016 to possibly 321 persons per km² towards the end of the century. The income of the population should rise from (extreme) poverty today to lower middle income in 10 years, to higher middle income in 20 to 40 years and to high income between 40 and 80 years, depending on the economic growth rate Ngorongoro District can achieve.

One might question: is this possible? When we look at the rest of the world we can see that this is very well possible²⁰. The existing economic resources of the district are much underutilised. What are the main economic treasures for Ngorongoro? And how can they best be exploited in such a way it will preserve the natural resources and will not exploit them until no resources are left? In the next section we present a possible development that will take the district to 2037 with a population at lower middle income with a minimum income of \$ 1,000 per person per year and a modal income of \$ 2,000 per person per year meaning that half the population has between \$ 1,000-2,000 while the other half has more than \$ 2,000.

¹⁸ A baby born in 2016 has a chance to live and experience high income towards the end of the century. Its mama will most likely live to see high middle income before 2060. The grandchildren of you, Tanzanian reader of this paper, will certainly have a chance to live in a high income country, but only if we act now.

¹⁹ NCAA has tried to support voluntary moving out of the Ngorongoro Conservation Area. Families that wanted to move voluntarily were given land and services (school, health services etc.) in Jema village in Oldongsambo. The families have started agriculture while maintaining also livestock and seem to be doing well in their new environment. The approach therefore can be successful when attractive alternatives are offered.

²⁰ A relatively small country like the Netherlands (three times the Ngorongoro District surface) manages to be a very rich country (near \$ 50,000 GNI per person per year) with a population of over 411 per km². And the Netherlands has 245 LU's per km² with Ngorongoro District currently at 32 LU's per km². The Netherlands has some 40% of its territory reserved as protected nature, wetland and forest, while this would be in Ngorongoro some 70%. The Netherlands has 15 Million tourist visitors per year, a density of 443/km² while Ngorongoro has around 1 Million visitors, a density of around 70 visitors per km². Practically all revenues from tourists in the Netherlands remain in the Netherlands; while possibly 80% of the spending of tourists visiting Ngorongoro disappears outside the district.

The sectors are:

1. Livestock – marketing, meat and milk processing
2. Agriculture and horticulture – marketing and food processing
3. Tourism and related services
4. Forestry
5. Mining
6. Energy

6 The economic development potentials for Ngorongoro District

Livestock

The current livestock herds used for a pastoralist way of livestock keeping can be very productive and help to preserve the wildlife and biodiversity in semi-arid areas with a low population density. As was stated above, this way of living can be preserved in the NCA and a game controlled area near the Serengeti Park when the district is able to create economic alternatives for the current population outside of these two areas. The livestock that can be maintained in these two areas is at most 150,000 LU's. This allows a human population of at maximum 37,500 people.

Outside of these protected areas there might certainly be space for another type of livestock keeping which is more intensive, possibly more and more non-grazing²¹, for meat and milk production. Non-grazing livestock keeping might grow to 500,000-750,000 LU's or even more²². In the pastoralist areas as well as in the rest of the district the focus must go to quality meat and volume of milk. Livestock should be seen as an economic investment and not primarily as a cultural or social value.

Currently there is no milk processing and the cattle is sold in Kenya cattle markets while in Tanzania mostly the sick and weak animals are sold. Moreover, livestock is brought to the market not when the animals are fat and big but when there is not enough food and many already have perished. This should change. Animals are raised to produce milk or to produce meat. They are sold at local markets, milk is processed in the district and meat is converted into quality meat products ripe for a national and international market. When we do a rough projection of the number of people that on the medium term (2037) could depend from income out of this sector it could be as many as 100,000 people²³.

²¹ This will be a long process of several decades which will be accompanied by complete privatisation of land and disappearance of village communal land ownership, at least in the 30% of the district that will be open for intensification of livestock and agriculture.

²² In the Netherlands, as reference, there is 245 LU's per km² which would be over one million LU's in Loliondo and Sale divisions. In the Netherlands a milk cattle farm has on average 90 milk cows who give each year a calf which can be used for meat production.

²³ These figures are not number of people working in the different sectors because the figure includes all members of families including those too old or too young to work. Furthermore this sector includes not only farmers keeping livestock but also the marketing and milk and meat processing industries. The same is the case in the other sectors.

Agriculture

Agriculture and horticulture including the food processing should grow in importance and this needs specialisation (not a bit of everything like is done now: everybody seems to have livestock, has land for agriculture and gardening and the surplus are sold at the local markets usually at moments when the prices are low). Irrigation should climb from 1% to at least 20% of arable surface by 2037. Mechanisation, intensification and diversification; improved storage capacity combined with food processing industry (milling flour, making food for livestock, processing maize, beans, greens, fruits, packing for retail and distribution) should make it possible that again some 100,000 people can live from agriculture related activities. The local experts and policy makers argue that the surface used for agriculture should not increase, and cannot increase due to climatic constraints, existing water reserves and the current conflicts between crop-cultivators and pastoralists in Loliondo and Sale divisions. But in reality the surface available for livestock keeping will automatically decrease because the pastoralists in their struggle to survive convert it for agriculture. That is the reason why livestock keeping eventually (end of the century) will be zero-grazing, while agriculture will produce the food for livestock as well as for human consumption. Water, water use and water distribution will be a crucial element for the further development of the sector, especially horticulture.

Tourism

Currently tourism and related services is mainly of national importance and escapes the gross district income. Currently the yearly number of visitors is around one Million for NCA. Assumed is that a maximum of 20% of tourist spending remains in the district economy. Supplies are coming from outside, and the population is not much employed by the tourism sector, except in some craft making and selling services. All management and many cooks, cleaners, guides, drivers and guards originate from outside the district. Cultural tourism provides some extra income and social projects are paid from charities related to the industry. The local part of the revenues from tourism should reverse in the coming 10 to 20 years to 80% that should stay in the district. In order to achieve this, the district should take over the supply chain for goods and services needed for the tourist sector. Food provision, organising and providing attractions and activities for tourists, hotel and other accommodation services, like transport, banking, shopping, restaurants can be managed by people living in the district. The main type of tourism at the moment is high-end-short-stay wild life oriented photographic and hunting tourism. The introduction of long stay leisure tourism is urgent, but should develop based on the principle of a sustainable use of natural resources. Why can only Zanzibar offer these tourism services and not Ngorogoro district? Mass tourism at lower prices with a big and diverse number of tourist attractions ranging from eco-tourism, walking safari's, attraction parks, health bathing in mineral and hot water springs, forest tourism, cultural tourism with cultural heritage and historical museum, low budget tourism, gambling business, bars, cafés and restaurants, music and dance festivals; these are possible around Lake Natron and in Loliondo/Wasso and other ward capitals. Important is to keep this other type of tourism far from the park and the game migratory areas. And last but not least the local meat and agricultural production should make out the main part of the food chain for the tourism sector and not Arusha or Karatu or neighbouring countries. The district might see an increase from currently an estimated 10,000 people that depend essentially of an income from tourism to at least some 100,000 by 2037.

Forestry

Currently the forests are in decline. A new forest management approach needs to invert this to save the indigenous forest and its biodiversity. The current government and community forests need to expand its surface between 20-40% and wood production (less and less for charcoal, mainly concentrating on furniture and construction industry) needs to be done in a sustainable way. The old forests must be safeguarded and massive new planting of trees with indigenous species should save the forests. All the private and government institutions should plant fast growing naturalized and indigenous tree species to provide them with firewood and timber. Currently the daily use of tree material is very high which should be reduced over time when other cooking techniques are introduced and applied (bio- and natural gas, solar- and wind-electricity). The communities should be taught which kind of trees should be planted in the different environments to serve them for purposes like: conserving the water bodies, firewood, timber and ensuring natural vegetation in their surroundings. Only this can assure sustainable nature based tourism in Ngorongoro district; the growth of agriculture and livestock keeping; as well as the forests in the district. Forests are of eminent importance combating the climate change.

Working in the forests could become an industry in itself where people by maintaining, expanding, and producing wood, and forest related products (like beekeeping and honey and wax industry) can earn a decent (middle) income. Possibly some 20,000 people can earn a living in the forests by 2037.

Mining

With a good and well conducted Environmental Impact Analysis in different potential mining areas, mining can boost the economy of the Ngorongoro district and more than 20,000 people could depend on this industry. We talk about minerals and valuable stones. Small scale mining of soda ash in Lake Natron and mining of minerals and precious stones as well as stones and sand for the construction industry is currently randomly organised in the district. It needs urgently assessment and control. Lake Natron is indeed an important source for soda ash but the lake serves at the same time as breeding site for 75% of the worlds lesser flamingos. This is a unique tourist attraction for bird lovers from all over the world. Therefore any further mining development in this area needs a seriously assessment, if not it might compromise the natural heritage and tourism potential in Lake Natron.

Energy

Growth sector: in the area solar power, water power, wind power, geo-earth energy, bio-gaz energy can all be developed in connection with the other economic sectors. It is difficult to estimate how big this sector can become over the next 20 years. But if it will be some 16,000 people whose family depend primarily on this sector we have a total of 356,000 people assured of a middle income by 2037, roughly one third in livestock keeping and milk and meat processing industry and marketing; one third in agriculture and horticulture with its processing industries; another one third related to the Tourism services sector leaving Mining and Energy as small sectors.

What about poverty reduction?

Currently the district main attention as well of most NGO's and CBO's active in the area goes to poverty reduction related stimulation of the local economy. This is important to help people survive and escape abject poverty, but with poverty reduction programs people will remain at subsistence

level. Poverty reduction programmes²⁴ are and remain important for a long time and they might help to pave the path for policies to **change the economy** to achieve middle income status for the district and its fast growing population. Above are some options mentioned, but we need our sectoral specialists, together with the leaders from the population and the business sector, the people and institutions that can invest in this area, to collaborate to explore how the Ngorongoro district economy can be changed and revolutionised, bringing welfare to all its population without destroying the natural resources which are the base of current and future welfare.

7 The Way Forward

Consensus and support for a new direction

The above mentioned development scenario will not be realised with a stroke of a pen, a good Vision document (Vision 2100?) or with a strategic development plan 2016-2020 and subsequent sectoral development plans. These are only the first results of a common effort to visualise the future and the first priorities in the coming years. First of all the political and the spiritual leaders, the wise people in the area, the leaders of local NGO's and the protectionist of the pastoralist lifestyle, the lobbies in support of East-African Pastoralism should be taken on board and taken into a process where they discuss and describe how they see the future of the pastoralist population, this population of possibly 1.4 million people in the Ngorongoro District by the end of the century. Only when the people of the district understand and accept the need for change one can think of viable strategies to realise this change.

Studies

Secondly we need a number of studies done to investigate the possibility for new economic developments in the different sectors. Studies are needed for intensification of livestock keeping and agriculture and horticulture, within the climatic conditions and the water resources available. These should include studies on water management without which intensive livestock keeping and intensive agriculture and horticulture is not possible. Thirdly we need a study done about the reforestation and the possibility of increasing and improving the forested areas in the district, the options for indigenous species and the dangers of uncontrolled introduction of exotic species on the nature and chances for sustainable forestry. Fourthly we need studies on the possibilities of touristic

²⁴ The current situation needs immediate action to help people to survive and at least a subsistence level. For this many initiatives are taken, to mention a number:

- Livestock breeding for poor families
- Small scale milk processing by women groups
- Poultry promotion
- Promotion of modern man-made beehives
- Community led sustainable forestry
- Leather and beads crafts training
- Microcredit and "Vicoba" or "Cocoba" (village community banks and conservation community banks)
- Micro enterprise / small entrepreneurs support
- Small irrigation projects
- Drinking-water wells
- Small solar/wind/water/bio-gaz energy
- Feeder roads
- Small food processing (flower milling and packing-sunflower etc)
- Kitchen gardening-household - food security

diversification. Similarly studies are needed about chances for renewable energy and nature preserving mining. And lastly we need studies to the short, medium and long run needs for infrastructural investments. Roads, train connections, bus transport, airports, a comprehensive vision on transport of goods and persons is needed, with a cost calculation.

And all this should lead to a new district land use plan taking into account the population prognoses for the different divisions, the effects on health and education facilities, urban expansion, industrial expansion for milk- meat- and food processing and other industrial development related with mining, road and other transport infrastructure.

Partners

Armed with this new vision translated into a new land use plan and sectoral feasibility studies the district can work on strategic development plans, and look for partners that want to invest in the district.

What are the partners with whom to achieve this new future? For the livestock sector first and foremost the 3% of the people who own the 80% of the livestock²⁵ in the district needs to be involved. Together they are decisive for the future of the livestock sector. How to make sure the sector turns into an economic profitable and sustainable sector? Is the way forward bringing them together in cooperatives for marketing and processing meat? How to involve the great number of small livestock keepers? On the long run (we speak of the end of the century) the livestock sector will be dominated by relative few livestock owners and the “mixed farming” where livestock and agriculture and even horticulture are mixed will have disappeared. Farmers will specialize in milk or meat production, supported by agriculture to support feeding of the livestock. And the agriculture will specialise into massive field production (grains, maize, potatoes, sugarcane and beans) and into horticulture (greens) and fruits. Will this be supported by cooperative organisations and cooperative banks like it happened in Europe? Or will the sector be pushed forward from the start with support of world agribusiness taking the risk the agricultural economy agenda will be decided by international actors and not by national or local interests? Possibly it is late to build a nation led agribusiness out of a cooperative movement and one might prefer to lean on ethical led international agro-partners like Fair Trade, combined with agribusiness and banking business related to European cooperative movement. The same is the case for setting up the milk- meat- and food-processing industry including the marketing mechanisms. Here it is wise to “shop” for models in Europe or elsewhere in the world and ask their cooperation, and investments to make it happen. But without financial risk-taking from local actors it is unlikely ethical lead foreign partners will step in. Tanzania and Ngorongoro have to believe in themselves.

Water management is a crucial factor to make intensive livestock keeping, agriculture and horticulture possible. Forests are indispensable for good water management. Ngorongoro and especially Loliondo and Sale divisions are semi arid areas and it remains to be seen how this issue can be resolved. Partners with great experience here might need to be found: from Israel or China? Or the more traditional partners from West Europe and the US? In the Netherlands a relative cheap method is developed to make reforestation in arid and semi-arid areas possible, even in deserts and on stone. Why not in Loliondo and Sale? Or do we have African partners with already enough

²⁵ According to unpublished calculations of the NDC.

experience and financial power on board to guide the district? Wangari Maathai's Green Belt Movement?

Then the Tourism sector. Tourism and the actors involved are currently concentrated around high-end wild life photo safari and hunting activities. We might want to invite actors like "Disneyland" or "Las Vegas" or may be game and leisure-park industry from West Europe, US, the Middle East (Dubai!) or China, or the health-mineral-warm-water resort industry from Germany or France or Hungary for help to build intensive tourism far from the Serengeti and the wildlife corridors.

The energy sector is worldwide ripe for a new "Green" approach and is ready to invest in alternatives for traditional energy sources as oil and gaz. Solar power (Germany and China), Wind power (Netherlands and Germany), Geo-energy (Iceland), Bio-gaz are all options that can easily be adopted in Ngorongoro. Whether Tanesco²⁶ is progressive and capable enough to lead this process is a question, possibly one wants to invite independent partners from abroad.

Mining is a very heterogeneous sector, ranging from soda-ash, sand and stone queries for (road) construction to precious minerals (gold, different quality stones) which all of it is mined in a mostly anarchic, non-controlled way, where many individuals try to find their luck. Naturally this paves the way for criminal activities, the illegal use of arms and brute violence. Even when NCA and the Game protected area is completely excluded from mining activities (possibly with exemption of some restricted small scale road related sand and stone queries) the remaining area of 4,256 km² is big enough to define areas where mining can be organised on a scale and way that will not impact the landscape, nor the social and economic values of the country and provide decent jobs and income to people. It might be developed with industrial partners that have a proven track record on these issues.

Make our visitors our ambassadors!

Ngorongoro district has the special attention of a wide range of countries in the world, basically because the district receives many citizens from all over the world for its natural beauty. These visitors vary from diplomats to business men, professionals in different areas but they have one thing in common: many are rich and many are influential. It is very urgent the district tries to organise and mobilise support from this group for its development goals. And here it is important to differentiate between the charities and NGO's type of activities, working on poverty reduction on the one hand and economic investment challenges like is proposed in this document on the other hand. Diplomats can make governments abroad interested. When the district tries to target through diplomats to find business partners for their economic development goals, using the beauty of the nature and its importance for the world heritage as "bait" it might lead to a coalition of investors interested to bring the economy of the district up to a level where the population can live in middle and eventually high income status. Of course this coalition needs to be accompanied by genuine, honest and altruistic people from the district and from Tanzania itself. Without this component; the proven altruistic willingness of local businessmen, livestock owners, bankers, communication companies and politicians who contribute money, energy and time in the development of the people, any plan to attract external partners will fail. If these partners are stupid enough to engage

²⁶ Tanzania's national electricity company.

in plans that are not financially supported by the local actors, business included, than those plans will fail.

Literature:

Århem, K. 1985, *Pastoral Man in the Garden of Eden, the Maasai of the Ngorongoro Conservation Area, Tanzania*. Uppsala Research Reports in Cultural Anthropology.

Kipuri, N. and Sørensen, C. 2008, *Poverty, Pastoralism and Policy in Ngorongoro*. ERETO, NPP (Government of Tanzania).

NCAA/NCD study on population trends in NCA

Nyerere, Mwalimu Julius K. *Speech by the President of the United Republic of Tanganyika and Zanzibar, Monday July 20, 1964*. In Payal Kalia, *World's Grand Speeches*, A&A Publishers (India)

Sakanda, H.G. 2013, *The Impact of Population Growth on Pastoralists Livelihood, a case of Ngorongoro District, Tanzania*. Dissertation submitted for partial fulfillment of the requirements for the Degree of Master of Arts (Demography) of the University of Dar es Salaam.

Tanzania National Land Use Planning Commission and Ngorongoro District Council Administration, *Draft District Land Use Framework Plan (2010-2030)*. The United Republic of Tanzania, Ngorongoro District Council (this plan remained DRAFT status)