The World Population in the Past and in the Future

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Abstract- The world population is known through censuses, but up to 1950 only by approximation. The more accurate the past is known, the better the future can be predicted therefrom. The approximations, together with the more precise-looking counts after 1950, are processed into a natural looking curve for the period 1800 up to now. Using the mathematical expression for this curve, predictions can be calculated for the future. In addition an extremely simple model has been realized for the growth of a population. Mutual comparison of the two curves results in interesting conclusions, of which the most important one is that the solution of the climate problem must be sought in the reduction of the world population.

Introduction

In the references [1] - [4] is, on the basis of detailed analysis of a variety of measured variables, argued that the climate problem is a symptom of a much more fundamental problem: the worldwide overpopulation. The severity of this fundamental problem is emphasized on the basis of a model of the growth of the world population.

Applied growth model of a population

Given the fact that a large number of statistical variables permit to work with (only) averages, the following extremely simple model of the growth of a population is established, based on the following assumptions:

1. The world's population is made up of N humans.
2. There are N/2 male and N/2 female humans.
3. Each human dies at age L, where L is the average age of the N humans.
4. The age of humans is distributed evenly, so there are N/L humans by age.
5. Each couple gets at a certain age x children, of which survive S to procreate.
   The variable S thus is the net result of the birth and of the death among youth.

From this model it follows directly that if S = 2 the population is not growing nor declining.
Indeed, every year N/L humans die and every year S.(N/2)/L humans procreate. At a constant population, these two expressions are equal.

This model is realized in an Excel program in which the increase and decrease of the population in each year is calculated from the previous year. By adding this net result of the population growth to the population in the previous the population of the present year is obtained. In symbolic form:

Year	**decrease**	**increase**	**population**
Y-1			N_{Y-1}
Y	$S.(N_{Y-1}/2)/L$	N_{Y-1}/L	$N_{Y-1}+ S.(N_{Y-1}/2)/L- N_{Y-1}/L$ (=N_Y)

In order to verify that this model fits somewhat with actual counts/estimates (henceforth the sake of brevity from now on referred to as observations) the graph from reference [1] is taken as the reference. This graph is based on a curve fitting of the available observations. This curve fitting is based on the model $y = c + a.t^b$ with the symbol t representing the year and y the number of humans. With the aid of this expression the number of humans outside the period of observation can be calculated too for each year. The period 1800-2100 is chosen in this article.
The variables L and S are, by trial and error, adjusted in such a way that the populations in 2100 in both models are equal. The initial value N_{1800} of the growth model is of course selected equal to the initial value of the observations. Figure 1 shows this result with L = 60 and S = 3.5.

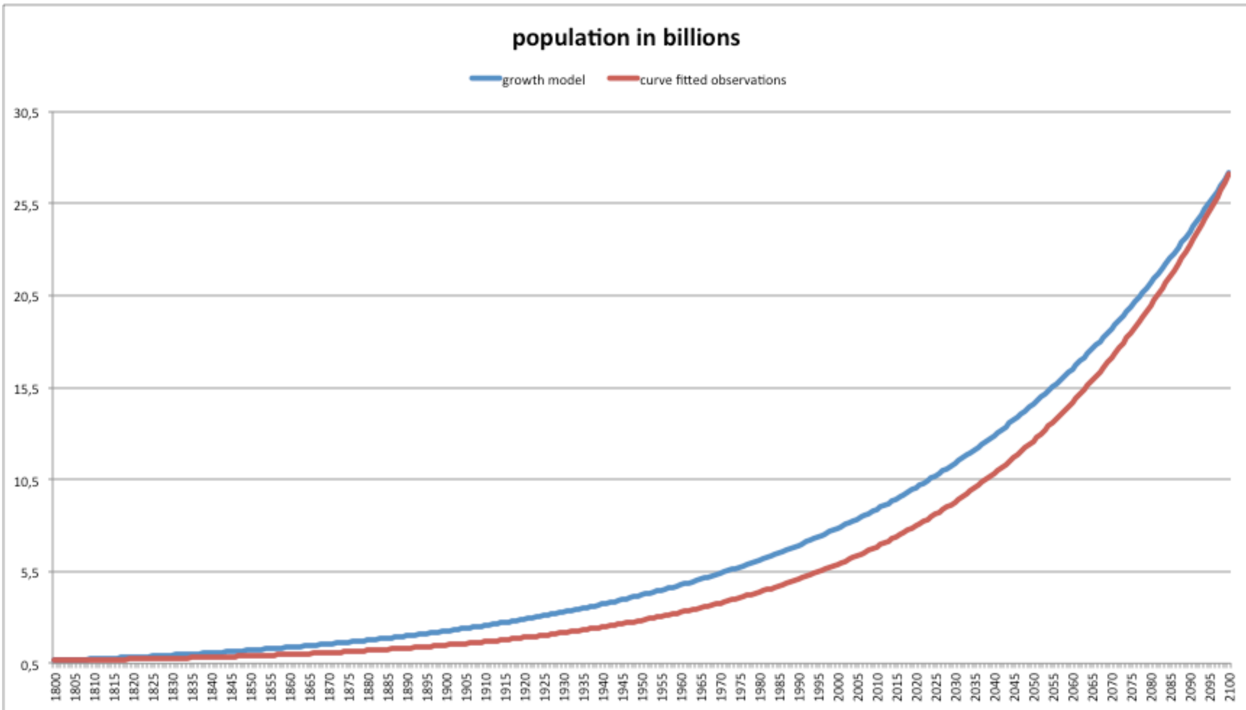

Figure 1 with L = 60 and S = 3.5 in the growth model

Subsequently, the growth model is adjusted by making both variables L and S as a function of time. L in the year 1800 is, of course, chosen to be smaller than in the year 2100. In-between it increases linearly with time. For S basically the same is done.

These variables are now labelled: L_{1800} and L_{2100}, respectively S_{1800} and S_{2100}.

Figure 2 shows the well-fitting result by choosing: L_{1800} = 60, L_{2100} = 75, S_{1800} = 3 and S_{2100}= 4.4
For information: the values L_{1800} = 60, L_{2100} =70, S_{1800} = 3 and S_{2100} = 4.27 results in equally perfect fit!

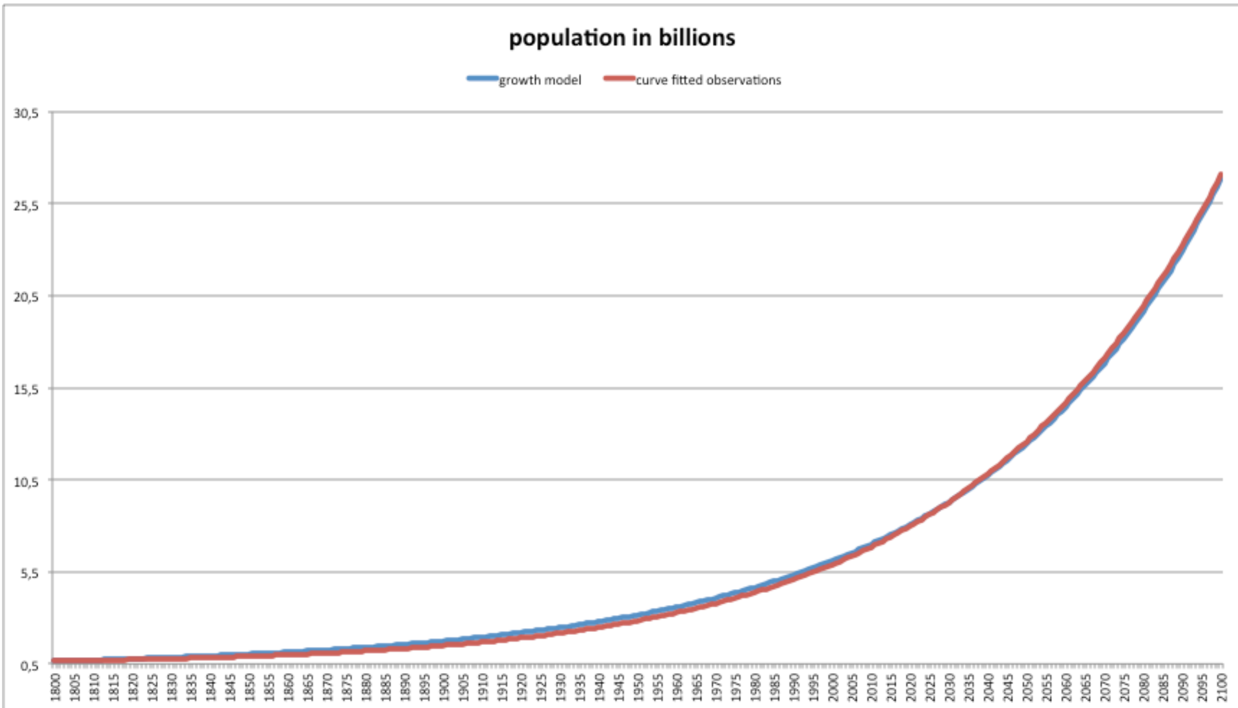

Figure 2 with L_{1800} = 60 and L_{2100} = 75, resp. S_{1800}= 3 and S_{2100} = 4.4 for the growth model

Based on this well-fitting growth model with the observations, this model is frozen for the period 1800-2017 in order to investigate what will be the development of the population in the future, varying *only* the variable S, so only S_{2100}. The reason for this is that variable L is found to be much less sensitive. It turns out that in 2017 the variable S equals 4.008. Starting from this value, S decreases linearly down to S_{2100} in the year 2100. Figure 3 shows the results for S_{2100} = 2, 1 and 0.

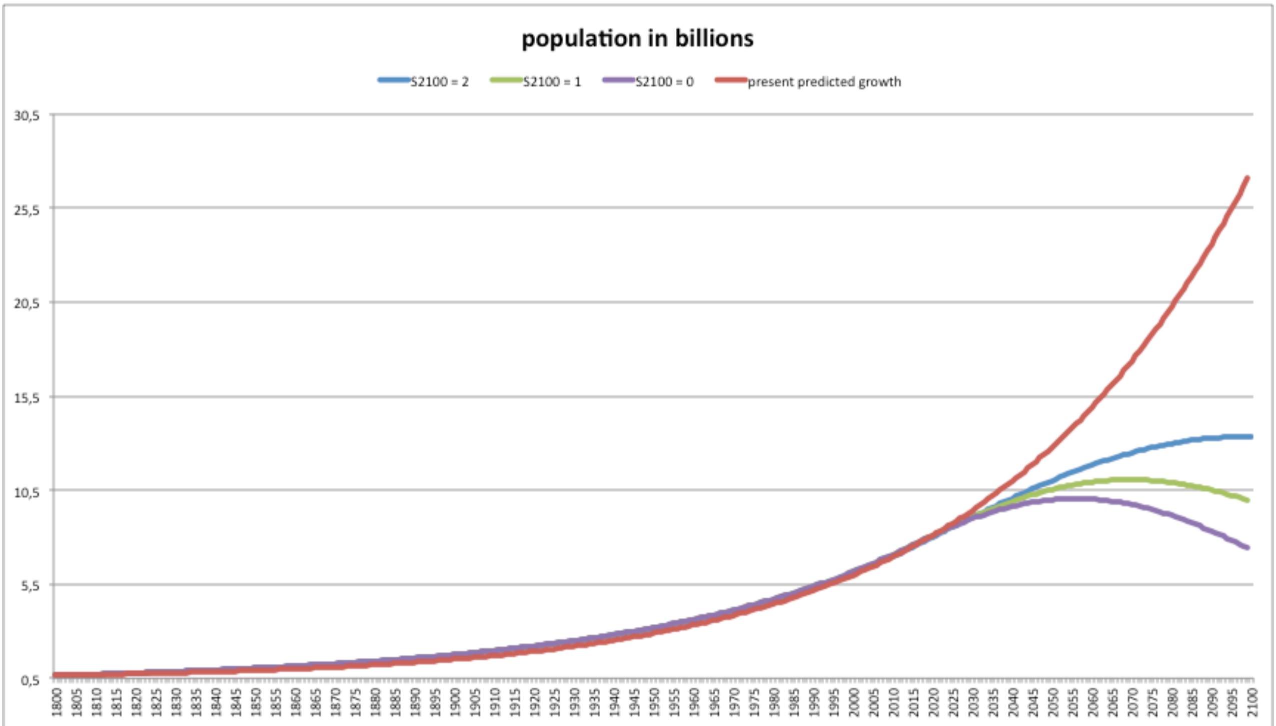

Figure 3, with 3 possible growth scenarios in relation to the current growth

Conclusions

1 With the described, extremely simple growth model, it is possible to reproduce perfectly the observed world population from the year 1800 to the present year.

2 The applied parameter values for the average age L and the average number S of people per pair that procreates again, all the way look realistic: L_{1800} = 60 and L_{2017} = 71 years, res. S_{1800} = 3 and S_{2017} = 4. The increase of the latter parameter is representative of the global average increased human health.

3 The 3 possible future growth scenarios all show that the current one rises so steeply that only a drastic reduction of the variable S, translated into a drastic decrease of the global birth rate, can save nature on earth and as a result human kind.

4 Given the results of the examinations, as listed in the attached references, the increase in global temperature will rise just as explosive as the increase of the world population if drastic birth control is not put in motion. This despite all the effort being put into the development of renewable energy.

5 The current climate top has to focus its efforts on the required birth control, instead of on CO_2 emission control, and therefore has to change its name into population(s)top.

References

[1] http://vixra.org/abs/1601.0313 Relation Between CO2, Global Temperature and World Population

[2] http://vixra.org/abs/1610.0091 Relation Between CO2, Global Temperature and Energy Consumption

[3] http://vixra.org/abs/1612.0392 Greenhouse Versus Living Room Model

[4] http://vixra.org/abs/1701.0525 About the Social Profit of Sustainable Energy