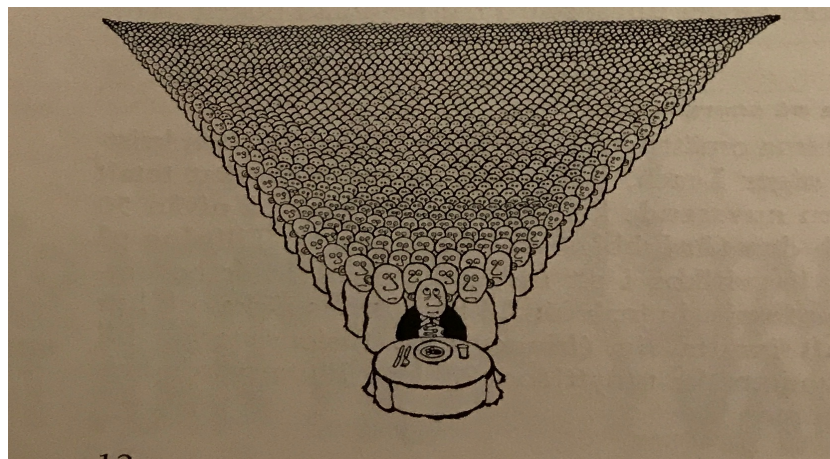


Discussing Population Growth

- The Magazine Sveriges Natur 1950-1995 and 2014-2017 - Looking for Articles about Population Growth as a Cause for Environmental Problems.



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The picture on the front page is one of the illustrations to “The Human Crisis” by Inga Thorsson in the yearbook from 1972, made by the signature EWK (Ewert Karlsson)

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Abstract

The global population increases. Even if the growth rate decreases, we currently become over 80 million more people on the Earth every year. According to UN DESA's medium projection, the population will still be increasing in 2100 and by then we will be more than 11 billion people on the Earth. The prospected curve for 0.5 more children per woman exceeds 16 billion people in 2100, while 0.5 less children born per woman leads to a population of 7 billion in 2100. This means that what we do is very important. The problem is that we do not seem to do much. Researchers and environmentalists were concerned about population growth between the 1950s and the 1990s, but since then the interest seems to have declined. Current researchers, Diana Coole, Martha Campbell and Garrett Hardin among others, explain why and when the silence around the population question arose. According to them, it was a successive decline in interest starting with the population conference in Bucharest in 1974, and final dismissal or change of attitude regarding the population-topic at the conference in Cairo 1994. This paper is a study of a Swedish environmental magazine, *Sveriges Natur*, and how this magazine has followed the international changes in attention for population growth. Trends have been shown both by counting the number of articles mentioning population growth in issues published 1950-1995 and 2014-2017, and when examining how the articles handle the subject over time. The result shows a temporal decline in number of articles concerned with population growth in the majority of the categories used. The trends of how the subject is handled over time are even clearer when it comes to what consequences population growth is supposed to have, and which political discourse is used when discussing population growth.

Sammanfattning

Den globala befolkningen ökar. Även om ökningstakten minskar, växer jordens befolkning för närvarande med över 80 miljoner människor per år. Enligt UN DESA's mediumberäkning, ökar folkmängden fortfarande år 2100 och då kommer vi att vara fler än 11 miljarder människor på jorden. Den beräknade kurvan för en ökning med ytterligare 0,5 barn födda per kvinna överskrider 16 miljarder människor 2100, medan 0,5 barn färre per kvinna leder till en befolkning på 7 miljarder 2100. Det betyder att vad vi gör spelar stor roll. Problemet är att vi inte tycks göra så mycket. Forskare och miljövänner var engagerade i frågan om befolkningstillväxt mellan 1950-talet och 1990-talet, men sedan dess verkar intresset ha minskat. Nutida forskare, Diana Coole, Martha Campbell och Garrett Hardin, bland andra, förklarar varför och när tystnaden om befolkningsfrågan uppstod. Enligt dem har intresset för frågan successivt minskat, en minskning som började under befolkningskonferensen i Bukarest 1974, med slutgiltigt avfärdande eller ändring i attityd under konferensen i Kairo 1994. Den här uppsatsen är en studie av en svensk miljötidsskrift, *Sveriges Natur*, och hur denna tidskrift har följt de internationella förändringarna i uppmärksamhet för befolkningstillväxten. Trender har visat sig både när artiklar som nämner befolkningstillväxt har räknats i nummer publicerade 1950-1995 och 2014-2017, och när artiklarna har undersökts med avseende på hur ämnet hanteras i artiklarna. Resultatet visar en nedgång över tid i antalet artiklar som refererar till befolkningstillväxt i majoriteten av de kategorier som har använts. Trenderna när det gäller hur ämnet hanteras över tid är ännu tydligare. Det handlar om vilka konsekvenser befolkningstillväxten antas ha, och vilken politisk diskurs som används när befolkningstillväxten diskuteras.

Introduction

Hypothesis

The subject for this study is how the amount of attention for population growth changed in the magazine *Sveriges Natur* (Sweden's Nature) during 50 years (1950 -1995 and 2014 - 2017). According to academic research, there has been a general decline of discussions about population growth internationally. The last UN-conference on population was held in 1994, but the issue has not become less urgent. The global population still increases, and this is an important cause (among others), for climate change according to the IPCC-assessment report 2014¹. According to Camilo Mora (1:2014) population growth is also "directly or indirectly linked to the deterioration of ecological systems (...) and a key factor for the success of conserving species and ecosystems (...)"².

The magazine *Sveriges Natur* might be seen as one forum of how the attention for the subject has changed in the Swedish society. The magazine is chosen as subject for the study since it is the environmental magazine which has been published during the longest timespan in Sweden (from 1910 until today), and is also well spread among interested Swedish readers (155 000 readers 2016)³. The main hypothesis is that the attention for global population growth as an environmental hazard has followed the international trend in the magazine *Sveriges Natur* during the years 1950-2017, and decreased. The hypothesis is based on articles and books by for example Diana Coole (2013)⁴, Martha Campbell (2007)⁵, Camilo Mora (2014) and Garrett Hardin (1993)⁶. Alternatively, reports about the problem may have occurred in a steady flow, or they may have increased (although this latter possibility was considered unlikely). One prediction to be tested will follow, later in text.

Other questions, posed in this paper and related to the hypothesis, concern the way in which the attention for overpopulation covariates with the global population growth, and in which way the issue of overpopulation is discussed. This last question can be divided in two parts: 1. which environmental problems population growth is supposed to cause most frequently (for example erosion, lack of resources or fresh water), and 2. with what political discourse the issue of population growth is handled, for example if it is mentioned in connection with unevenly distributed resources or overconsumption, and how this changes over time. Formulated as sub-hypotheses these questions become:

- a. The attention for population growth in *Sveriges Natur* does not covariate with the global population growth over time.
- b. Over time, the articles about population growth in *Sveriges Natur* will change views on which environmental problem population growth is (mainly) supposed to cause.
- c. Over time, there will be a change in the political background for the discussions about population growth in *Sveriges Natur*.

It turns out that the main hypothesis is not fully clarified by only considering number of articles mentioning population growth. But when the contents of the articles were examined with regard to the sub-hypotheses, trends showed up in the way the subjects were handled over time.

¹ IPCC-assessment report 2014 https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf

² Mora, Camilo, 2014. Revisiting the environmental and socioeconomic effects of population growth: a fundamental but fading issue in modern scientific, public, and political circles. *Ecology and Society* 19(1): 38.

³ Crona, Malin, Allt fler läser *Sveriges Natur*, *Sveriges Natur*, March 20, 2017

⁴ Coole, Diana, (2013) Too many bodies? The return and disavowal of the population question, *Environmental Politics*, 22:2, 195-215

⁵ Campbell, Martha, 2007, Why the Silence on Population?, *Popul Environ* (2007) 28:237–246

⁶ Hardin, Garrett (1995), *Living within Limits*, Ecology, Economics and Population Taboos, Oxford University Press

The magazine Sveriges Natur – general trends during the period 1950-2017

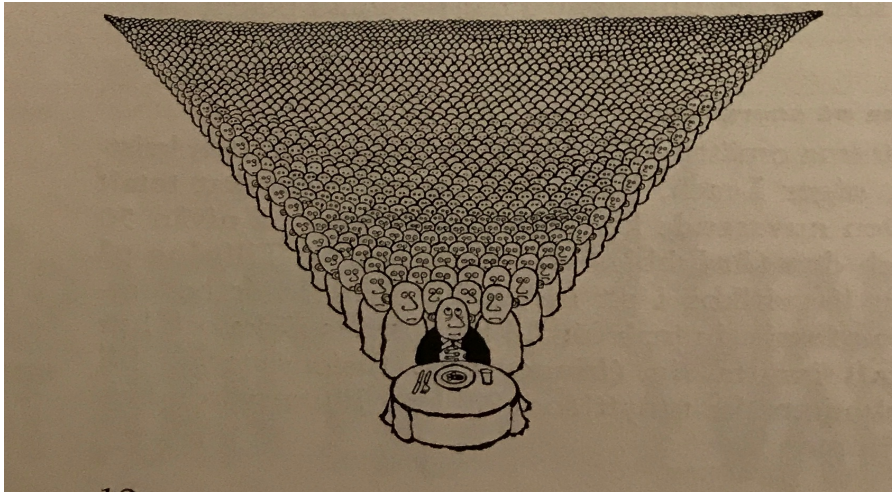
Sveriges Natur is published by the Swedish organization *Naturskyddsföreningen* (earlier “*Svenska Naturskyddsföreningen*”). During the 1980s the magazine had more pages. The amount of content is not always shown by the number of pages though, but rather in the font, which successively gets bigger and sparser, and the amount of pictures and size of headlines which fill up the pages at the expense of text.

In the 1950s, a view of nature as wilderness seems predominant. Also, there is concern about oil emissions in the Baltic Sea and declining amounts of birds as a result of the use of pesticides in Swedish agriculture. Other themes are hydropower plants, with impact on the nature in the northern part of the country. In the 1960s there was a large focus on toxins in nature (probably due to Rachel Carson’s book *Silent Spring*, published in 1962).

During the 1970s the acidification was an urgent problem as well as excess fertilizers in nature. In the 1980s, nuclear power was discussed (not least 1986, with the breakdown in Tjernobyl), and in the 1990s the most common issues were biodiversity, nuclear power and non-renewable resources. During the 1970s there were frequent illustrations, sometimes about population growth. Ewert Karlsson illustrated the vignette “Internationell naturvård” and also the article “The Human Crisis” by Inga Thorsson (yearbook, 1972) (picture 1).

There is a gap in my reading of the magazine, between the years 1995 and 2014. The magazine changed during these years. The issues from 2014 and onwards seem thinner, the articles shorter, and texts seemingly simplified. There is also a new focus on consumption: which goods to choose for less impact on the environment (clothes, food, furnishings etc), other common topics in later issues are degradation of mangrove plantations, plastic debris in the seas and global warming.

Between 1950 and 1995, there were several international conferences on global environmental issues. The ones in Stockholm 1972 and in Rio de Janeiro 1992 influenced the content of *Sveriges Natur*, in increasing number of articles about population growth (see below).



Picture 1. One of the illustrations to “The Human Crisis” by Inga Thorsson in the yearbook from 1972, made by the signature EWK (Ewert Karlsson).

Previous work concerned with neglect of the population growth issue

The prediction from hypothesis to be tested is that the amount of articles about population growth in *Sveriges Natur* decreases, especially after the Cairo conference in 1994. The hypothesis is based on research by Garrett Hardin, Diana Coole, Martha Campbell, Helen Kopnina and Haydn Washington⁷

⁷ Kopnina, Helen and Washington, Haydn, 2016, Discussing why Population Growth is Still Ignored or Denied, Chinese Journal of Population Resources and Environment, Volume 14, 2016, Issue 2

and others, describing an international decline in interest. According to Coole (195:2013) population growth was regarded as “an urgent environmental issue” during the 1960s and beginning of the 1970s, which suggests that the decline in attention started already in the mid-1970s (196:2013).

The world's population and the environment

In 1950, the Earth had 2.5 billion inhabitants. In 1990, the population was 5 billion people (Coole, 195:2013). According to World Population Prospects⁸ (1:2017), in 2017 the global population was 7.6 billion. In the Prospect the population will have increased to 8.5 billion in 2030 and to 11 billion in 2100. The current growth rate is 1.10 percent per year (2:2017).

According to Mora (2014) and Crist et al. (2017)⁹ there is reason to be concerned about future food and water supplies, not least because the production of both food and water causes “massive environmental and climatic impacts” (Mora, 5:2014). Mora states that “agricultural expansion accounts for the annual deforestation of 5-10 million hectares of forest, whereas inappropriate practices have caused the erosion of ~30% of the world's cropland at a rate of 10 million hectares per year.” He also states that “habitat loss is the leading factor in wildlife extinction, while also releasing captured CO₂ and tampering with the functionality of forests to store CO₂.” On top of this, “more than 2.5 million metric tons of pesticides and 142 million tons of fertilizers are used in agricultural practices each year” (Mora refers to the FAO, 2011), and these pesticides and fertilizers “contribute to greenhouse gases due to methane emissions from livestock and nitrous oxide from soil fertilizers (...) and are a leading cause of biodiversity change because of their runoff.” (Mora, 5:2014)

Conferences on population growth

Bucharest 1974 was the UN-conference on the relationship between population and development. According to a thesis by Timothy J. McCune,¹⁰ the Bucharest conference was characterized by a “growing international political rift” (144:2012). The conference's purposes were, among others, to discuss ways of limiting “population growth through implementing population and social welfare policies with direct effects on fertility” (McCune, 144:2012). But there were delegates (mainly from the Third World), who claimed that international population assistance was “racist, genocidal, or imperialistic, or accused Western nations of advocating population control as a substitute for foreign aid” and instead, pressed the necessity to “bring about a new and more equitable international economic order” (145, 146:2012). The result was, according to McCune, a compromise. According to Garrett Hardin, referring to the conference in Bucharest 1974 (36:1993)¹¹ it was partly because of the need for a scapegoat, that (mainly) the Chinese delegation managed “to steer the conference away” from discussions of population control¹². The Chinese delegate, according to Hardin, declared “Population is not a problem under socialism”, instead he blamed the imperialist “aggression and plunder”. Hardin writes that the Chinese delegate's analysis “was warmly welcomed by other

⁸ World Population Prospects: The 2017 Revision – Key Findings and Advance Tables
https://esa.un.org/unpd/wpp/publications/Files/WPP2017_KeyFindings.pdf

⁹ Crist, Eileen; Mora, Camilo; Engelman, Robert. The interaction of human population, food production, and biodiversity protection, Science, 21 Apr 2017:
Vol. 356, Issue 6335, pp. 260-264

¹⁰ McCune, Timothy J., 2012,
Quantity in Light of Quality: Rethinking the “Population Problem”, UMI, Dissertation Publishing

¹¹ Hardin, Garrett, 1993, Living within Limits, Economics and Population Taboos, Oxford University Press

¹² The term “population control”, stems, according to Campbell (242:2007) from the Cairo conference 1994, and was used derogatory by opponents for attempts of the earlier family planning efforts. In spite of this, she uses it as a means to describe programs or actions with purpose limit population growth, and I use it in the same way.

delegates from the Third World”. The Indian delegate, according to Hardin, claimed that “Development is the best contraceptive”. Since 1974, much national development has occurred internationally. Diana Coole writes: “Despite developing countries’ antagonism to American-led initiatives on population control in Bucharest [1974], many had introduced donor-dependent, national family planning programmes by the 1980s because they regarded population growth as detrimental to development” (209:2013).

During the conference in Mexico City 1984, the political rift from Bucharest 1974 remained, although some of the countries were less hostile to population control. Instead the US delegation stated that “those developing countries experiencing population pressures should reduce government interference in their economies in order to promote economic growth and thereby reduce fertility” (McCune, 146, 147:2012, quoting Finkle and Crane, “Ideology and Politics at Mexico City” 1.). The plan from Mexico City advised governments not to encourage women to have abortions, and no quantitative targets were expressed.

The ambition of the Cairo conference 1994 was “to formulate a consensus position on population and development for the next 20 years” (McCune, 148:2012, quoting C. Alison McIntosh and Jason L. Finkle, June, 1995: 224). But the main focus was on “the role and welfare of women”. However, the political rift had grown and “delegates spent much of the conference arguing over terms related to abortion”. Some muslim nations were boycotting the conference, and the official result from Cairo was a non-binding programme containing a “consensus meant to encourage voluntary policies in order to stabilize population growth to somewhere well below the projected 12.5 billion estimate for 2050” (McCune, 149:2012). Important is though, that all these UN-conferences declared that population policies are the sovereign right of individual nations.

Kopnina and Washington also date the turn of attention for population growth to the 1994 UN-conference in Cairo. They write “there they ‘stopped talking about family planning’ and instead spoke of ‘women’s reproductive health and rights’ (...).”¹³

John Bongaarts and Steven W. Sinding¹⁴ refer to a report from the UN secretary general to the Commission on Population and Development (2009) in which is stated that the “proportions of population expenditures on family planning and on reproductive health both declined between 1995 and 2007 (from 55% to 5% and from 19% to 17%, respectively)”, which is directly after the Cairo-conference. According to an article by Karl-Erik Norrman and others in Svenska Dagbladet (October 14, 2015), the global funding for family planning has decreased and of the Swedish total aid only 5-7 percent are aimed for Sexual and Reproductive Health, and only a part of this is for family planning¹⁵.

After the Cairo-conference in 1994, there were no more UN- conferences on the theme of population growth (although the Cairo-conference was planned for a period of twenty years ahead).

Limitations

This study will not be able to draw any conclusions about general trends in Swedish media or global media. A study with that purpose would need a broad study of different magazines,

¹³ Kopnina, Helen and Washington, Haydn, 2016, Discussing why Population Growth is Still Ignored or Denied, Chinese Journal of Population Resources and Environment, Volume 14, 2016, Issue 2

¹⁴ Bongaarts, John; Sinding, Steven W. Letters, (in a reply to Petroni, Suzanne, The Decline in Funding for Family Planning), International Perspectives on Sexual and Reproductive Health, Guttmacher Institute, Volume 35, Issue 3, September 2009, pages 153

¹⁵ Karl-Erik Norrman, Carl Wahren, Lars Wedén and Anders Wijkman, Rosling har fel om jordens befolkning, Svenska Dagbladet, October 14 2015. (In English: https://bioenv.gu.se/digitalAssets/1679/1679218_rosling-is-wrong...-translation.pdf)

television programs etc. If such a study would be done, this paper might constitute a part of it. Also, this paper might be seen as indicative.

Another limitation is that this paper cannot tell anything about the proportions of sentences connected to population growth per issue, since it should, if done properly, be done in words per issue, which was not possible within the time-plan.

While writing this, there are still two issues, and two yearbooks missing. These are issue 6 1977, issue 3 1978, yearbook of 1991 and yearbook of 2014.

Method

I have read issues of the magazine during the period 1950 - 1995 and 2014 - 2017, including advertisements. I have collected articles referring to population growth in a global sense, or connected to population growth in a local or national sense, which relates to problems on a global scale. This is often the case with population growth in India, China, some African countries and Indonesia for example. Also, I have included many different variations of the concept, like “overpopulation”, “increasing fertility”, “increasing birth rate” and many others as long as they fulfill the conditions posed above.

Articles have been divided into three categories: 1. articles mentioning population growth (or formulations equal in meaning to population growth) at least once, 2. articles with at least two sentences on the subject of population growth, 3. articles containing at least five sentences about population growth.

The resulting trends in articles concerning population growth gets stronger with as many articles as possible as basis, which is a reason to include articles with only one sentence. But apart from the risk of missing single words of population growth in the about 23 000 pages, there is reason for changing the main category of investigation to articles containing at least two sentences about population growth: the variety between articles containing only one sentence is large. Sometimes messages are keen even if short, for example the editorial in issue 1, 1974: “The time for decisions regarding the energy politics is getting closer. In global respect only the population question is of more importance” and sometimes more casual as in issue 4 1982: “National Conference -82” (translation of “Riksstämman -82”). “The delegates from 122 SNF-circuits discussed a series of propositions – the population question, conservation of the genetic resources, the threat to pastures and wetlands, traffic of snowmobiles, and many other things”. This variety decreases when excluding articles containing less than two sentences, and this category would give a more correct picture of the attention for the subject of population growth in *Sveriges Natur*. Unfortunately, analyzing of articles get more difficult with fewer articles, especially regarding the articles from the 2010s of which there is a total of eleven, but only two of them contain at least two sentences about population growth. Many results from the examination of articles with more than five sentences also suffer from being too few which risk bias in analysis of combined subjects and other characteristics, compared to the articles from other decades or categories.

A problem which is harder is that there seems to be a tendency of the articles in total to become shorter over time. As will be seen below, there is a clear increase over time in proportion of articles which mention population growth only in one sentence. Therefore, when it comes to frequency of articles, I will consider articles with more than two sentences, but when it comes to comparing the contents of the articles, mainly articles from all the three categories will be taken into account.

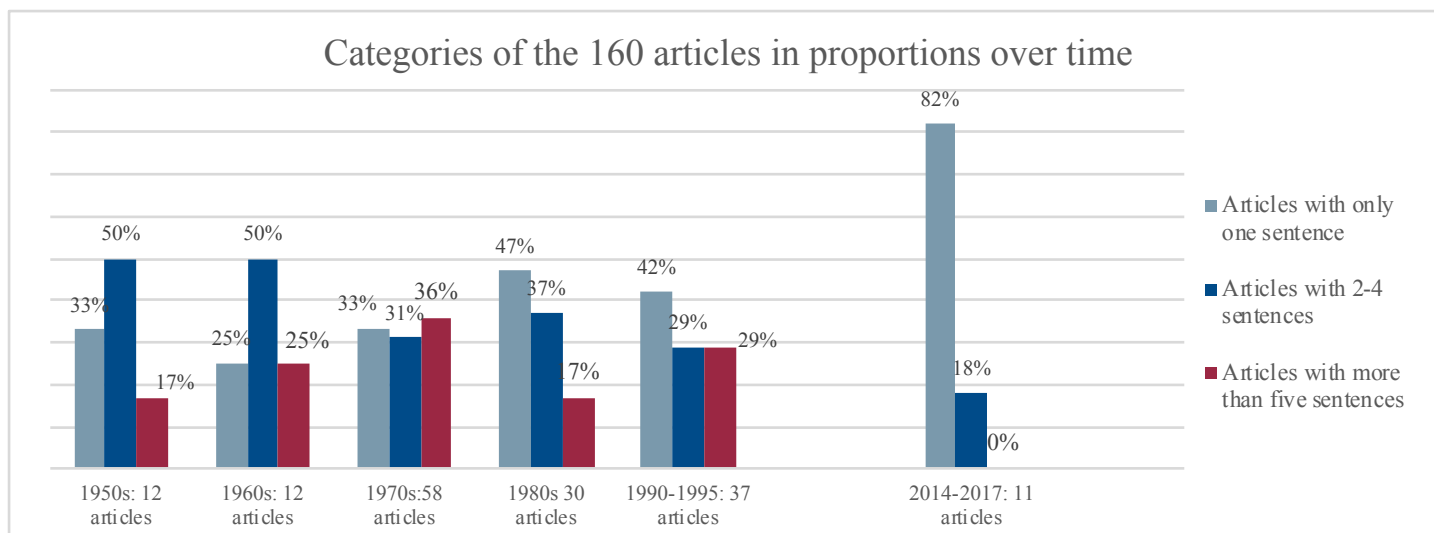


Figure 1. The proportion of articles containing only one sentence increases with time, while the other two categories decrease. This might mean that (1) the general trend is that articles in Sveriges Natur decrease in size or (2) a general trend is that the interest for population growth decreases (3) both or (4) it is coincidental. In addition, it shows that the proportion of articles with more than five sentences are more common than both other categories in the 1970s-column, which might be seen as a sign of more concern for the problem of population growth during this period (Appendix 1).

Special problems

1. In issue 4, 1987 theme “One Single Earth” (translation of “En enda jord”), the articles were close, should it be one long article or many shorter? The decision fell on many shorter, since that was in line with the other articles in size and form, at that period. The year 1987 got four more articles. This is significant for the result.
2. Articles from 2010s are few (eleven) and consist mainly of one and two sentences about population growth. It works if counting all of the articles mentioning population growth, it also works when counting only those who mention population growth in more than five sentences (none) but it does not work when counting those which mention population growth in two-four sentences, since there are only two posts in the 2010s, and the result can only become 0%, 50% or 100%. The five-sentence-category has the same problems for decades with few articles.

Results

The sum of issues and yearbooks examined is 362. The sum of all articles found connected to population growth is 160. Sum of articles containing at least two sentences about population growth is 96. And sum of articles containing at least five sentences about population growth is 42. This means that there are 64 articles containing only one sentence about population growth and 54 articles containing two-four sentences about population growth.

It turns out that the question about precise starting point for the decline of interest for population growth as an environmental issue is not fully clarified. The frequency of articles does decrease after 1994 in the first category (*Figure 3a*), but only compared to the 1970s and early 1990s. Compared to the 1950s and 1960s the number of articles after 1994 increases in this category. But if using the diagrams covering articles with at least two sentences (*Figure 3b*) the articles after 1994 decrease. In these diagrams there are two peaks, one in 1972 and one in 1992. These are the peaks for the conferences in Stockholm (1972) and Rio de Janeiro (1992). In 1994, the conference in Cairo took place, which was the year the decline in attention for population growth was supposed to have begun. The decline may have happened after 1995, but the actual time of decline is not seen in the diagrams of frequency, due to gap in issues studied.

All articles over time:

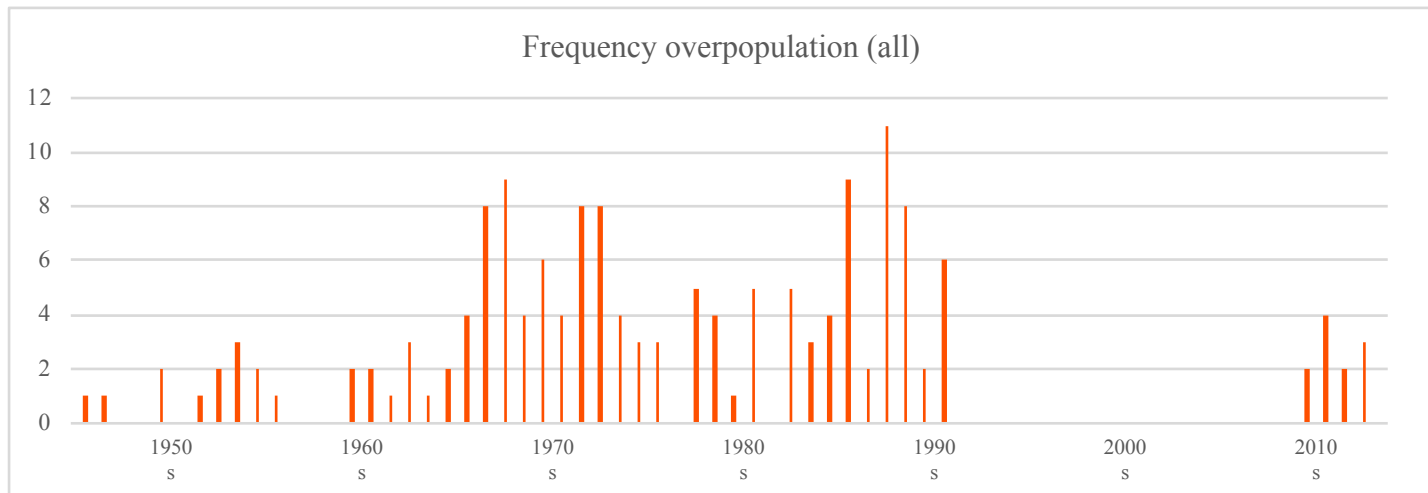
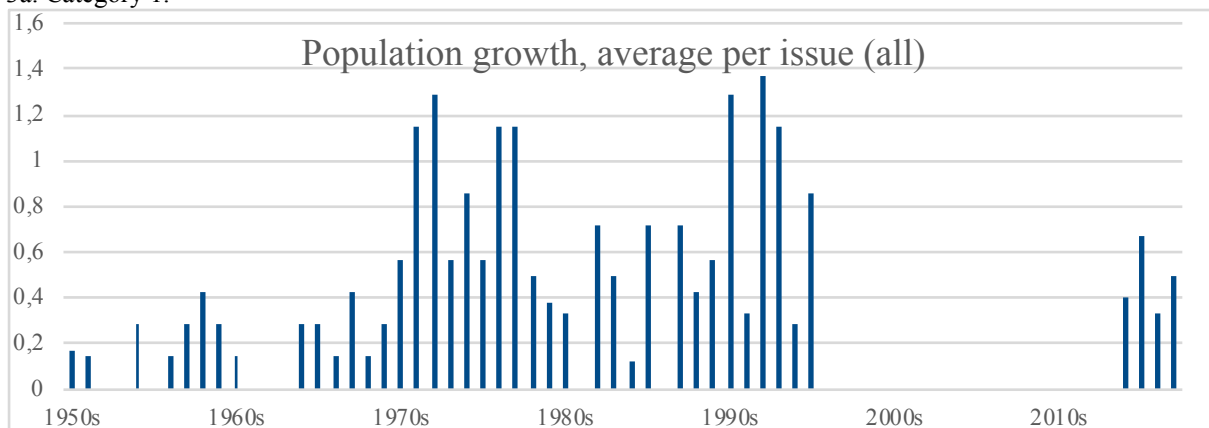


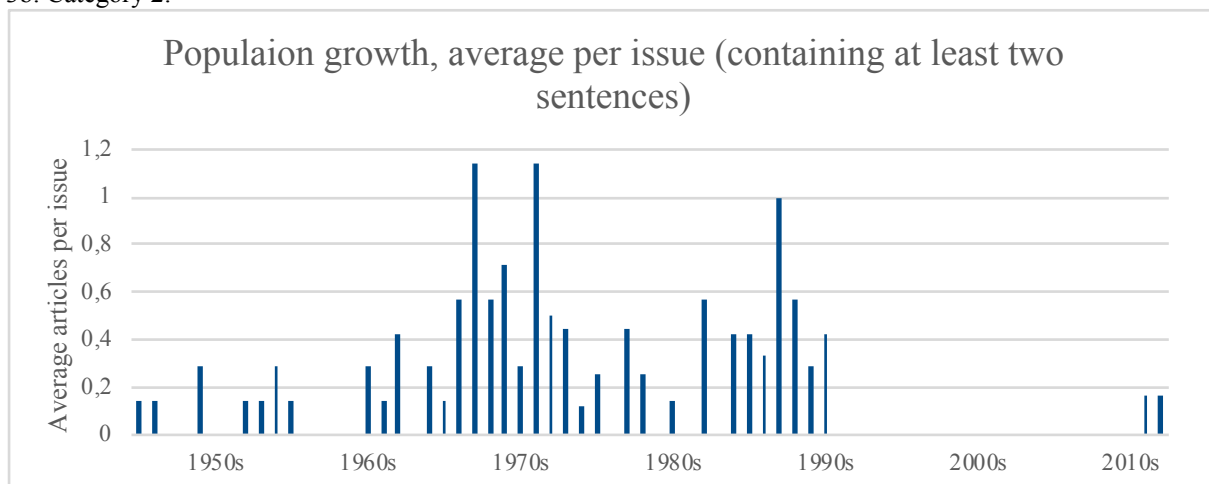
Figure 2: Frequency diagram over time (per year), all articles.

Average articles per issue over time, category 1, 2 and 3.

3a. Category 1.



3b. Category 2.



3c. Category 3.

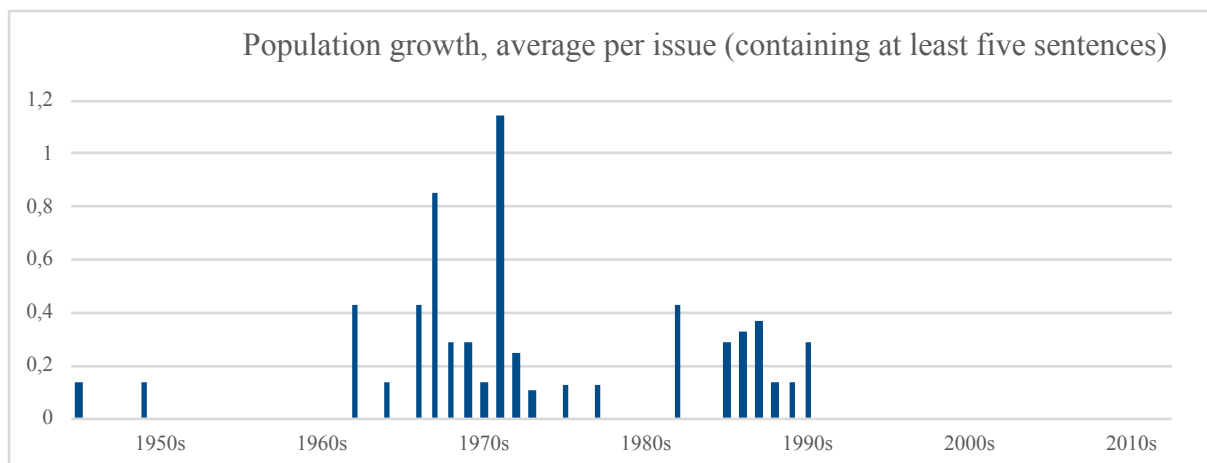


Figure 3: Apart from showing differences between categories, these diagrams show at least two peaks: One during the 1970s and one during the 1990s, which are connected to the conferences in Stockholm 1972 and Rio de Janeiro in 1992. 3a. does not show any decrease in the articles after 1995, which contradicts the prediction of this study.

The increase of articles about population growth during the 1970s was not only an increase in articles, but also in the expressed concern about population growth within the articles (Figure 3). Before the conferences in Stockholm and in Rio de Janeiro, what influenced the interest in population growth may have been books, for example “The Road to Survival” by William Vogt, (1948), Our Plundered Planet, by Fairfield Osborn (1948), and later The Population Bomb by Anne and Paul Ehrlich, published 1968, and (mainly) The Tragedy of the Commons by Garrett Hardin, published 1968, but also by Barry Commoner, The Closing Circle, 1971, who was critical to the referrals of population growth as an environmental problem. The Club of Rome and their first report The Limits to Growth (1972) has also been mentioned.

In appendix 2, there are diagrams and tests for the probability of the number of articles (in average) to have increased in number in accordance with the size of the population increase. A chi2-test (Figure 4 and Appendix 2) shows 0.05 probability for the amount of attention for population growth being related to the increase of the global population for the first category, containing all the articles. Figure 4 shows expected values for average increase in articles about population growth per year and observed values for the average amount of articles about population growth per year.

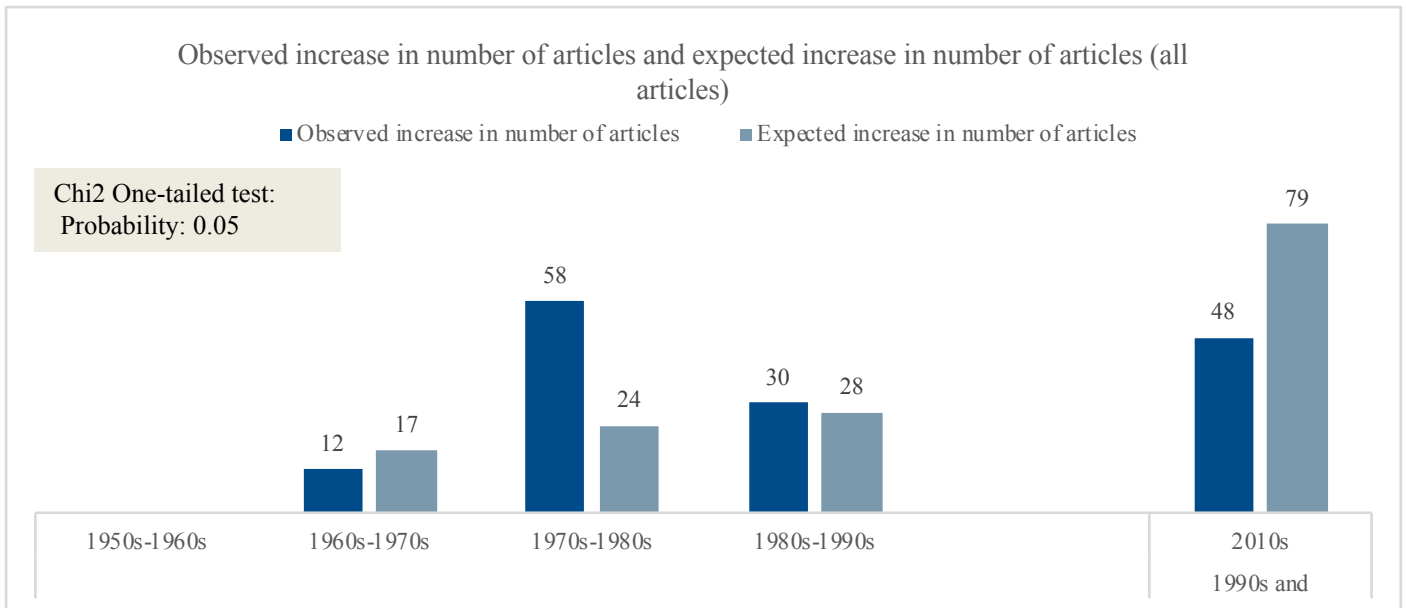
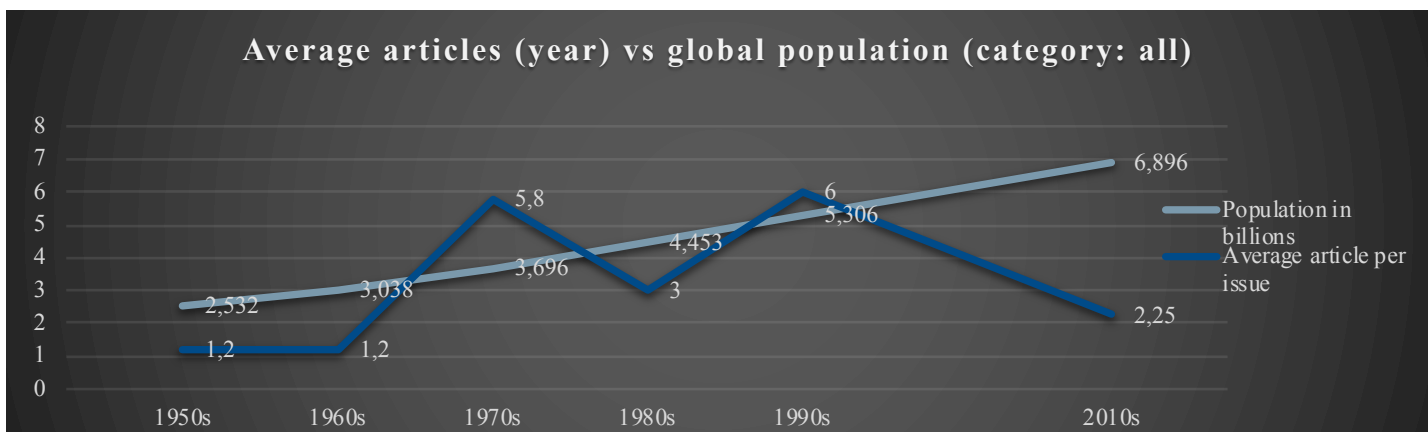
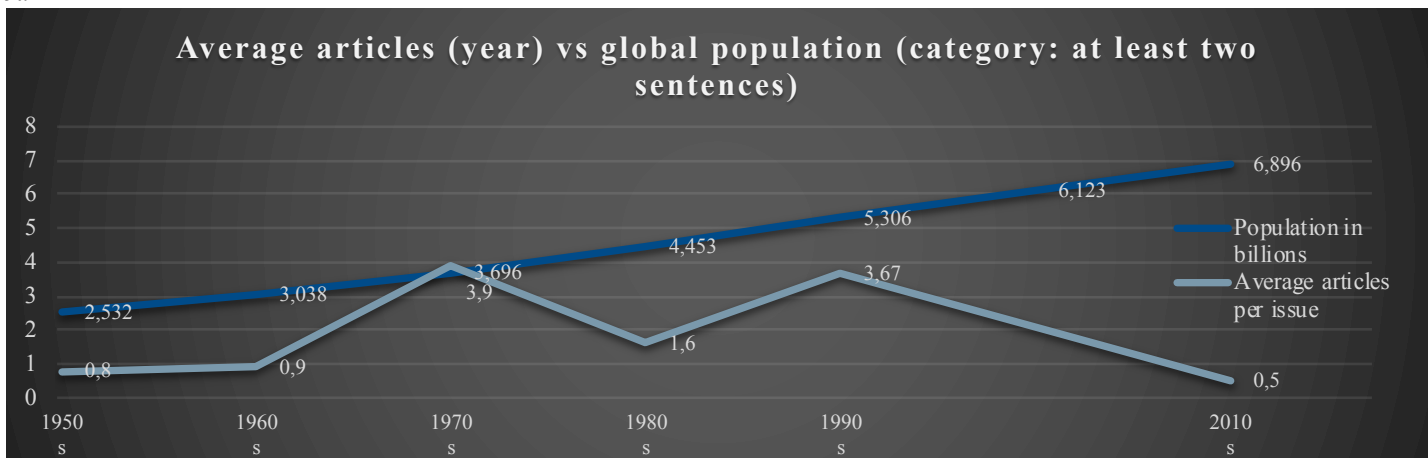


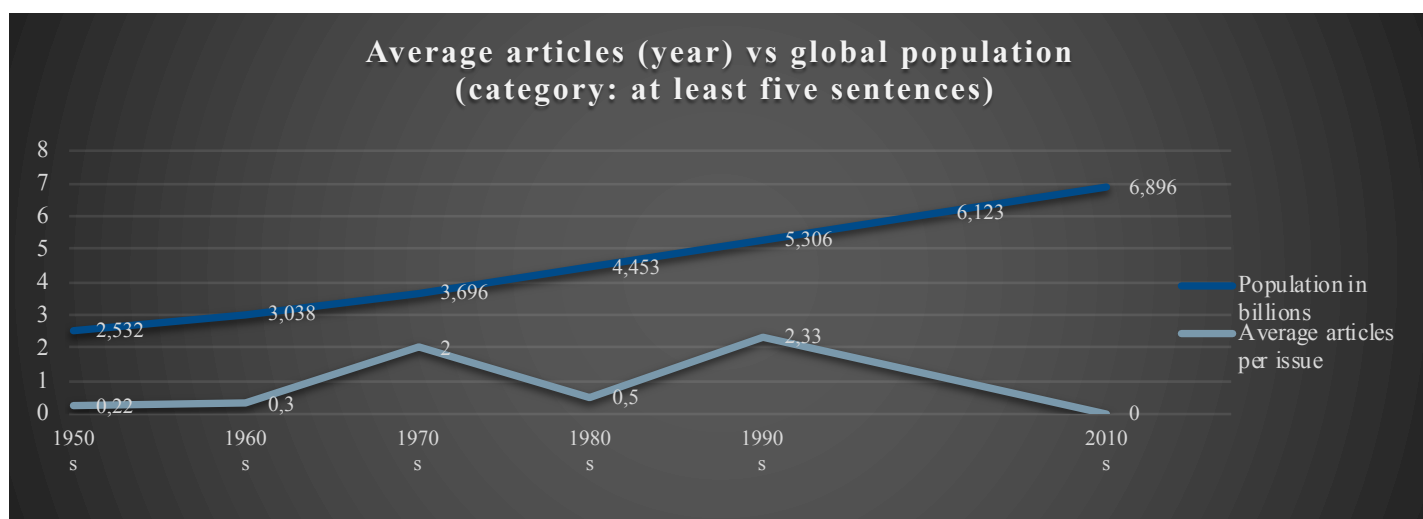
Figure 4: Expected values for average increase in articles about population growth per year, if the amount of articles would correspond to the increase in global population growth (light blue staples) and observed values for average amount of articles about population growth per year (dark blue staples). The last staples are the observed and expected value for the 1990s and 2010, which are ten years if counted together, in order to make them equal the previous staples with ten years in each staple.



5a



5b



5c

Figure 5: The amount of attention for population growth in Sveriges Natur compared to the global population growth. (Appendix 2)

Categories and trends

Several trends show up when examining the articles in the three categories. In appendix (3, 4, 5), there is a scheme in which the subjects mentioned in connection to population growth in all the separate articles are arranged in groups (the concept of “groups” is chosen in order to avoid confusion with the concept of “categories” which refers only to the division of articles in number of sentences). In appendix 6, there is a summary diagram.

The groups are divided in two sections. Section 1 are groups concerning environmental problems mentioned in connection with (usually caused by) population growth, such as shortage of resources, shortage of food, loss of biodiversity, erosion, toxins, problems related to fresh water, handling of waste and climate change. There were also other problems mentioned in the articles, such as shortage of soil for cultivation, the ozone layer etc, but to a smaller extent, and therefore got sorted under the label “other” (with a note). Section 2 are political characters of the articles, such as if they mention global injustices, associated environmental degradation to consumption, if the subject of population growth was dismissed, and if articles contain any suggestions of solution to population growth.

Among writers of the articles, some seem to be more concerned about population growth than others. Most abundant is Kai Curry-Lindahl, who wrote seven articles concerned with population growth, although not all of them are stressing the subject very hard. Georg Borgström wrote five articles which all of them contain at least five sentences about population growth, as well as stressing the global injustices, and usually also overconsumption in the western societies. Of all the articles examined, only a few are entirely about population growth as the main subject. These are for example Inga Thorsson in the yearbook of 1972 “The Global Crisis of Humanity” (translation of “Mänsklighetens globala kriser”) “More People do not cause the poverty” (translation of “Mer folk orsakar inte fattigdomen” from the special issue for the Rio conference of 1992) by María Elena Hurtado, who question the number of the amount of people willing to use birth control, Yearbook 1973: The Global Deforestation – Grand Final of Forest Robbery (translation of “Den globala skogsskövlingen – baggböleriets stora final”) by Georg Borgström.

Results: Section 1

This analysis only regards trends within articles of population growth, not articles in the whole magazine. Still it is possible to see that many articles connect population growth to toxins during the 1960s, which probably is due to the overall interest for environmental toxins connected to the publishing of Rachel Carson’s *Silent Spring* in 1962. (Figure 6)

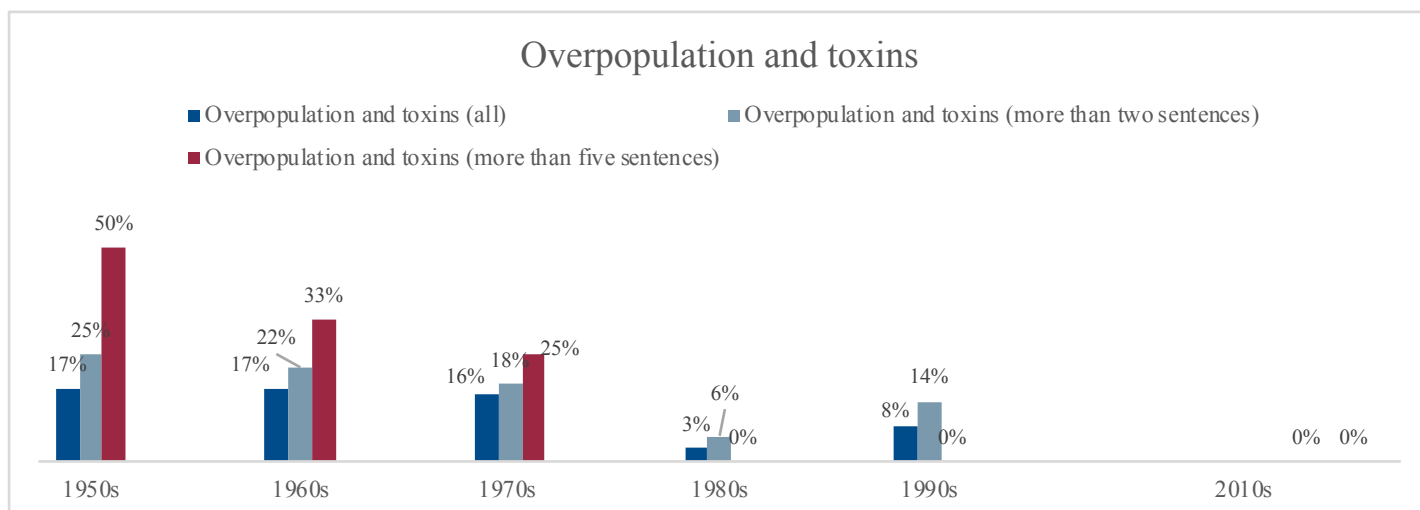
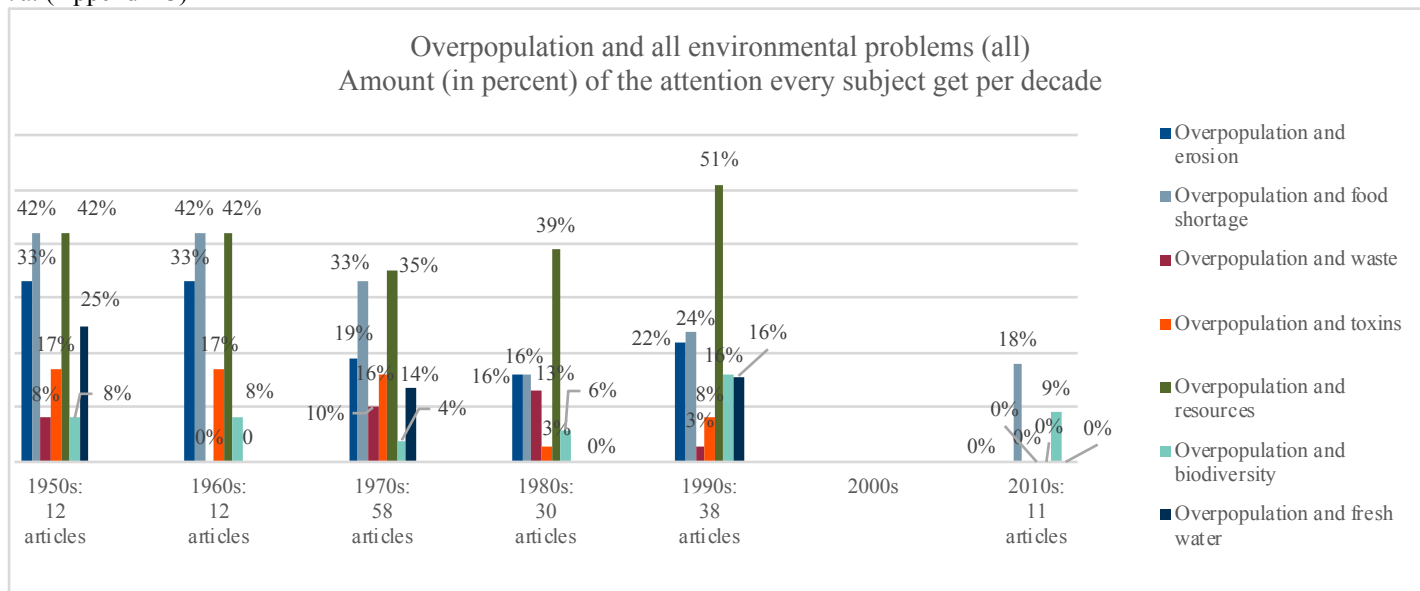


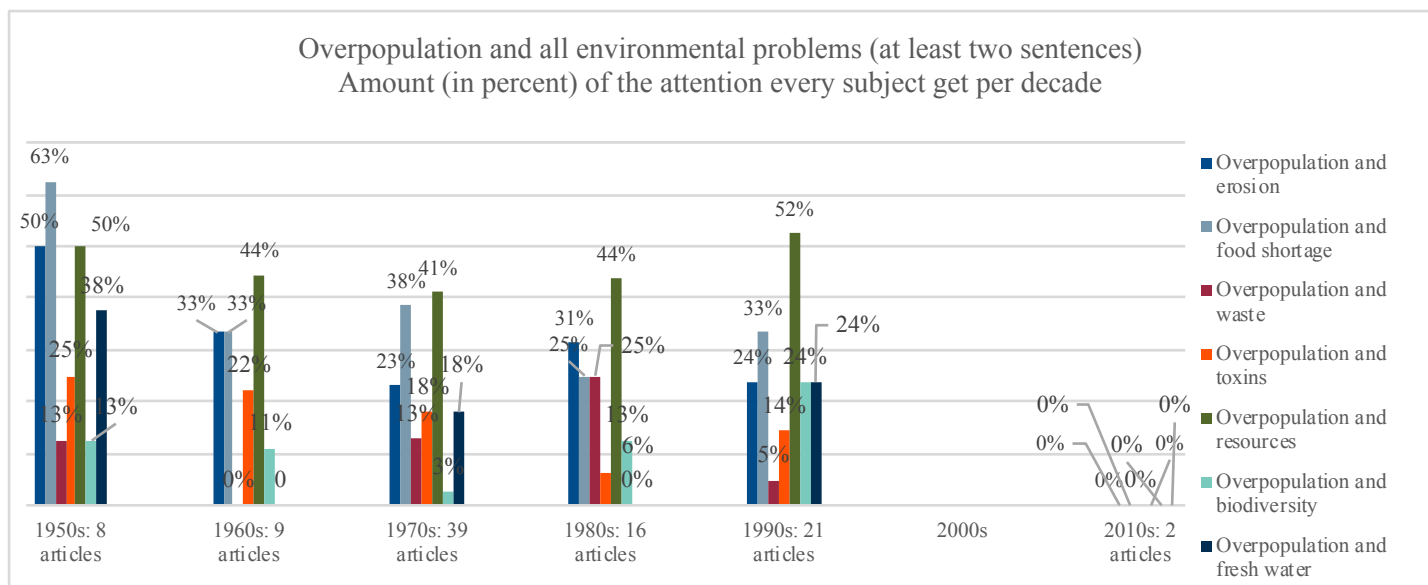
Figure 6. This diagram shows the amount (in percent) of each category mentioning toxins in combination with population growth every decade. (Appendix 6). The total amount of articles is **1950s** category 1: 12, category 2: 8, category 3: 2 articles, for **1960s** category 1: 12, category 2: 9, category 3: 3 articles, for **1970s** category 1: 58, category 2: 40, category 3: 21 articles, for **1980s** category 1: 30, category 2: 16, category 3: 5 articles, for **1990s** category 1: 38, category 2: 22, category 3: 11 articles and for **2010s** category 1: 11, category 2: 2, category 3: 0 articles

Another trend, in the category “all articles” (Figure 7) what seems to be regarded as the most overwhelming problem, connected to population growth, is lack of resources. All curves decrease with time, apart from the curve concerning population growth and biodiversity which ends about at the same place (9%) as it started (8%). (More details: Appendix 3, 4, 5)

7a. (Appendix 3)



7b. (Appendix 4)



7c. (Appendix 5)

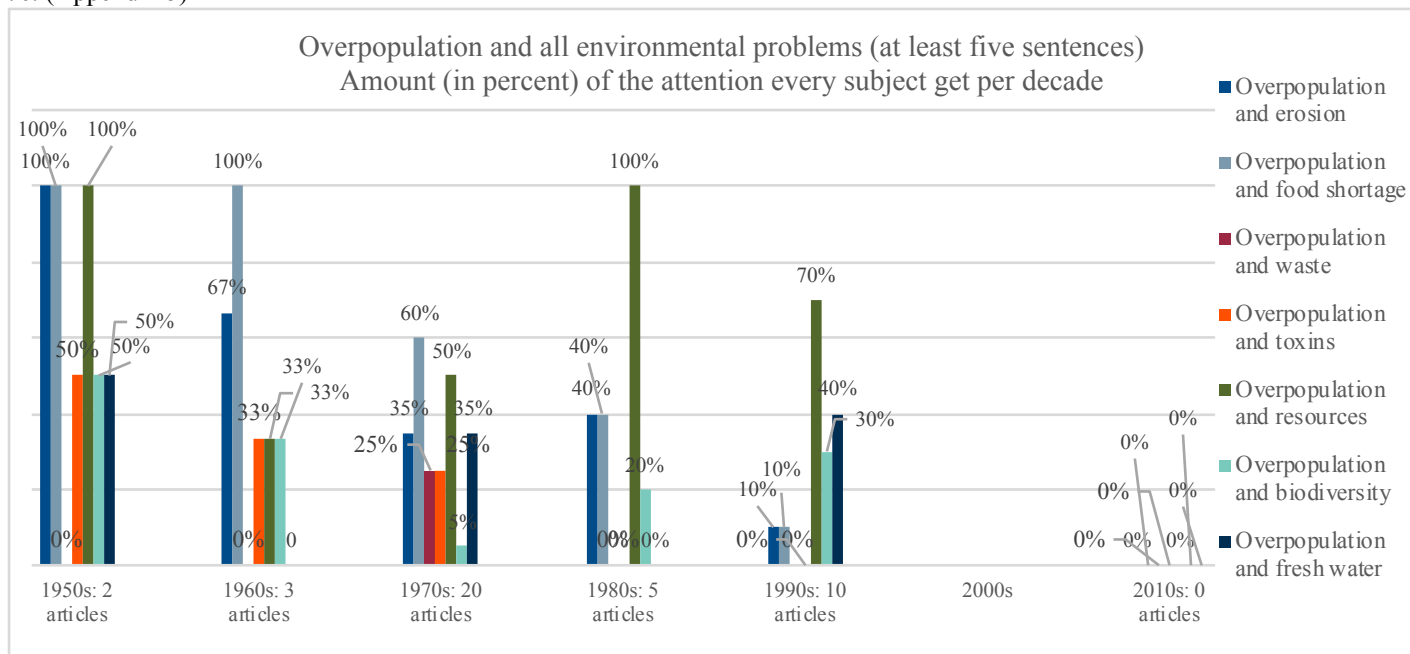


Figure 7. Summary tables for environmental hazards, supposed to be closely connected to population growth (usually referred to as “caused” by population growth). The table shows the proportion of attention, in number of articles referring to the problem, in percent. As an example, 7a shows that during the 1950s, 42 percent of the articles referring to lack of resources as closely connected to population growth in the category including all the articles, while in category 2 (7b) 50 percent of the articles during the 1950s refer to lack of resources as closely connected to population growth. As in all figures, the total amount of articles is **1950s** category 1: 12, category 2: 8, category 3: 2 articles, for **1960s** category 1: 12, category 2: 9, category 3: 3 articles, for **1970s** category 1: 58, category 2: 40, category 3: 21 articles, for **1980s** category 1: 30, category 2: 16, category 3: 5 articles, for **1990s** category 1: 38, category 2: 22, category 3: 11 articles and for **2010s** category 1: 11, category 2: 2, category 3: 0 articles

Results: section 2

Two groups which are close but differ, are the articles not considering population growth a problem, and the articles in which the subject of population growth as a problem is dismissed. The group of articles which do not consider population growth as a problem includes articles mentioning population growth in some way, but do not problematize it (Figure 8). Since I have already limited the number of articles suitable for the study as those concerned with population

growth as a global issue, this group is small (ten articles). The other group, articles in which population growth is dismissed, contains articles in which the subject may have been presented as a problem, but then still is dismissed (Figure 9). This group is also small (eight articles).

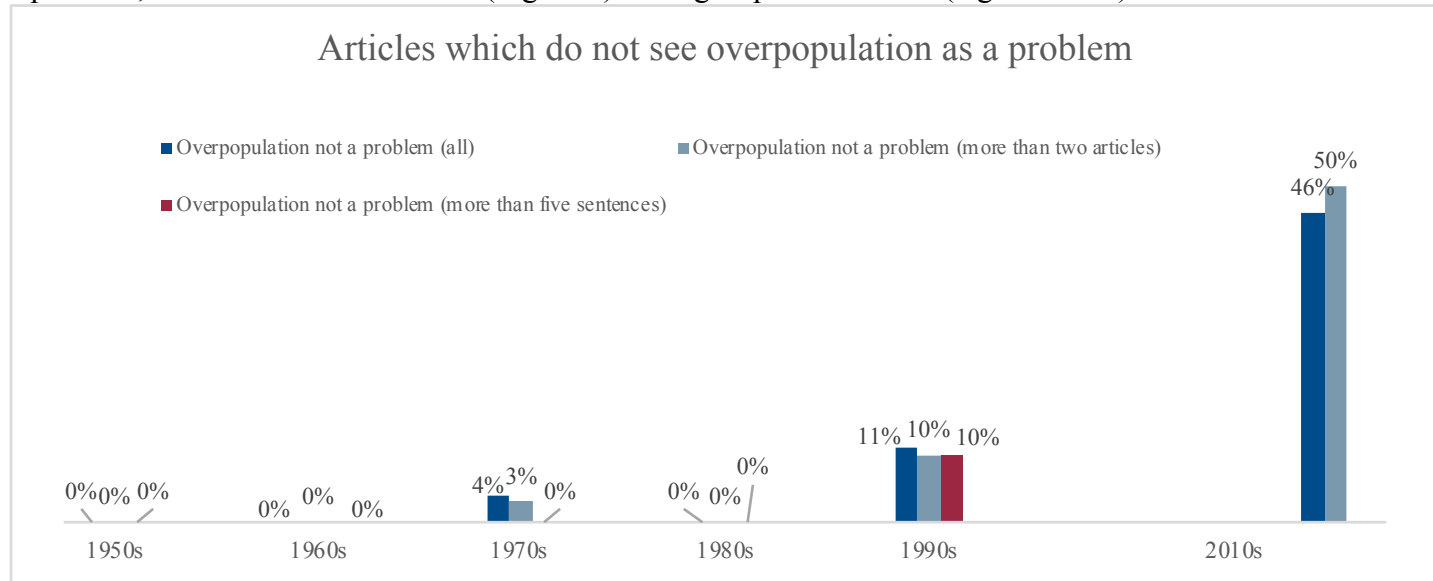


Figure 8: Proportion of articles not considering population growth a problem in percent (Appendix 6)
Total amount of articles is **1950s** category 1: 12, category 2: 8, category 3: 2 articles, for **1960s** category 1: 12, category 2: 9, category 3: 3 articles, for **1970s** category 1: 58, category 2: 40, category 3: 21 articles, for **1980s** category 1: 30, category 2: 16, category 3: 5 articles, for **1990s** category 1: 38, category 2: 22, category 3: 11 articles and for **2010s** category 1: 11, category 2: 2, category 3: 0 articles

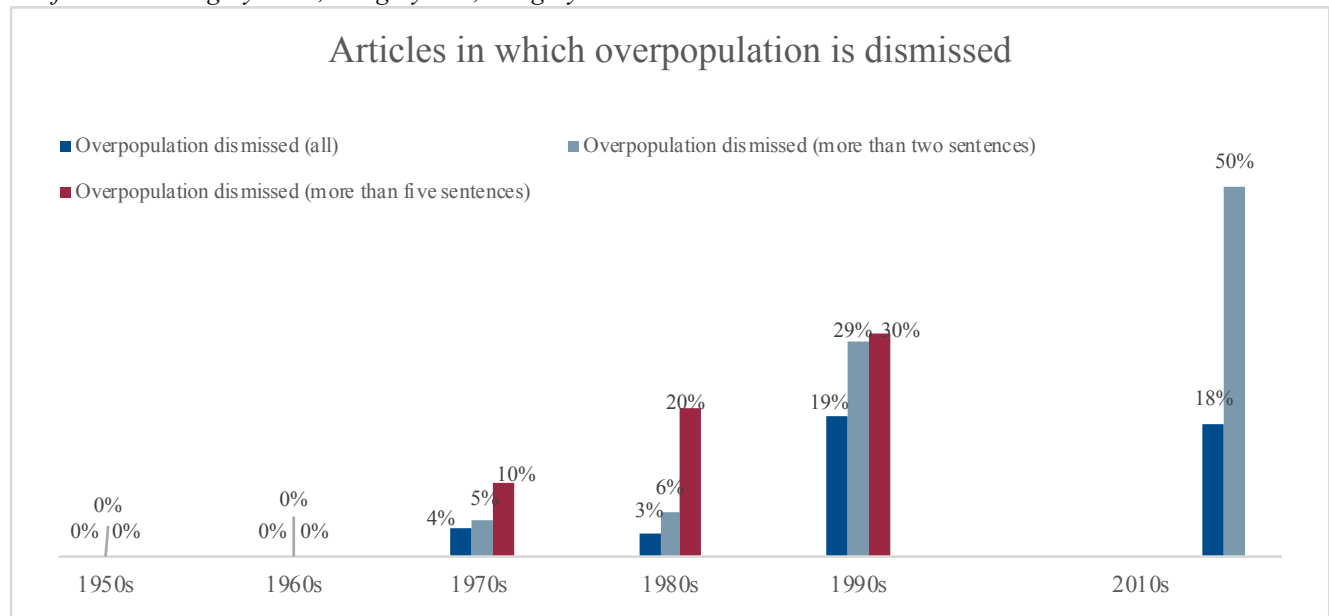


Figure 9: Proportion of articles in which population growth is dismissed, in percent of articles in each category which dismissed population growth as a problem (Appendix 6). Total amount of articles is **1950s** category 1: 12, category 2: 8, category 3: 2 articles, for **1960s** category 1: 12, category 2: 9, category 3: 3 articles, for **1970s** category 1: 58, category 2: 40, category 3: 21 articles, for **1980s** category 1: 30, category 2: 16, category 3: 5 articles, for **1990s** category 1: 38, category 2: 22, category 3: 11 articles and for **2010s** category 1: 11, category 2: 2, category 3: 0 articles

In Section 2 articles containing some kind of problematizing of overconsumption are included. The article must also contain the subject of population growth, but the two subjects (population growth and consumption) must not necessarily be connected in the article (which is the case in the first section).

Population growth and consumption seem to be of great concern for many authors in *Sveriges Natur* (Figure 10), and the interest increases with time, apart from in the category articles with more than five sentences, which show a somewhat inconsistent trend – possibly a result of too few articles in this category. This inconsistency in the results for category 3 shows in figure 11 as well.

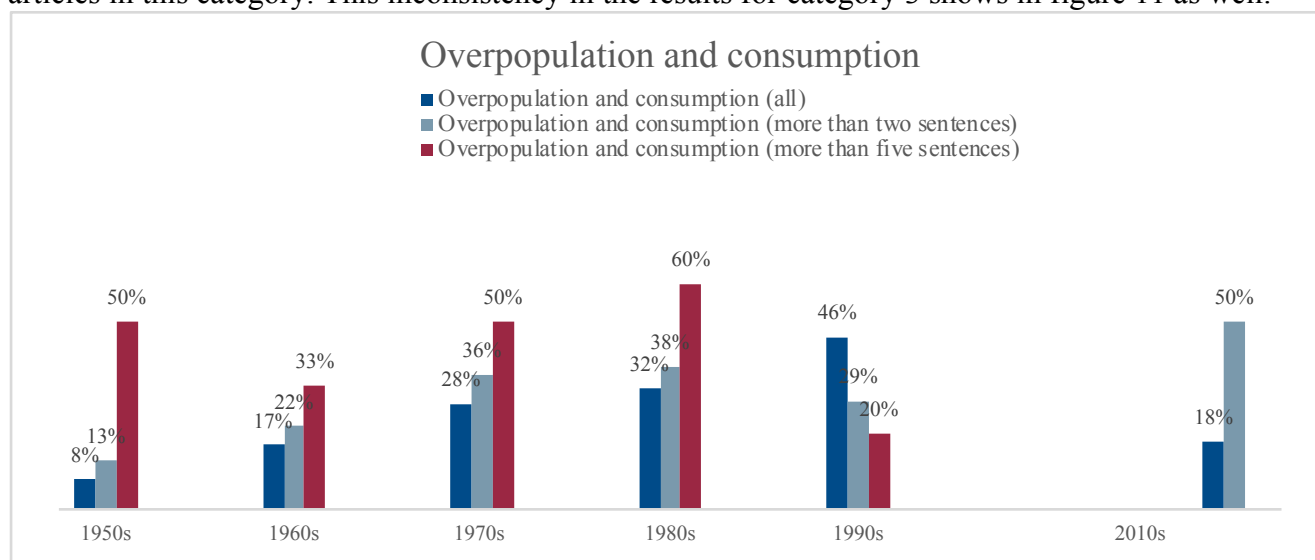


Figure 10. Population growth and consumption in percent (Appendix 6)

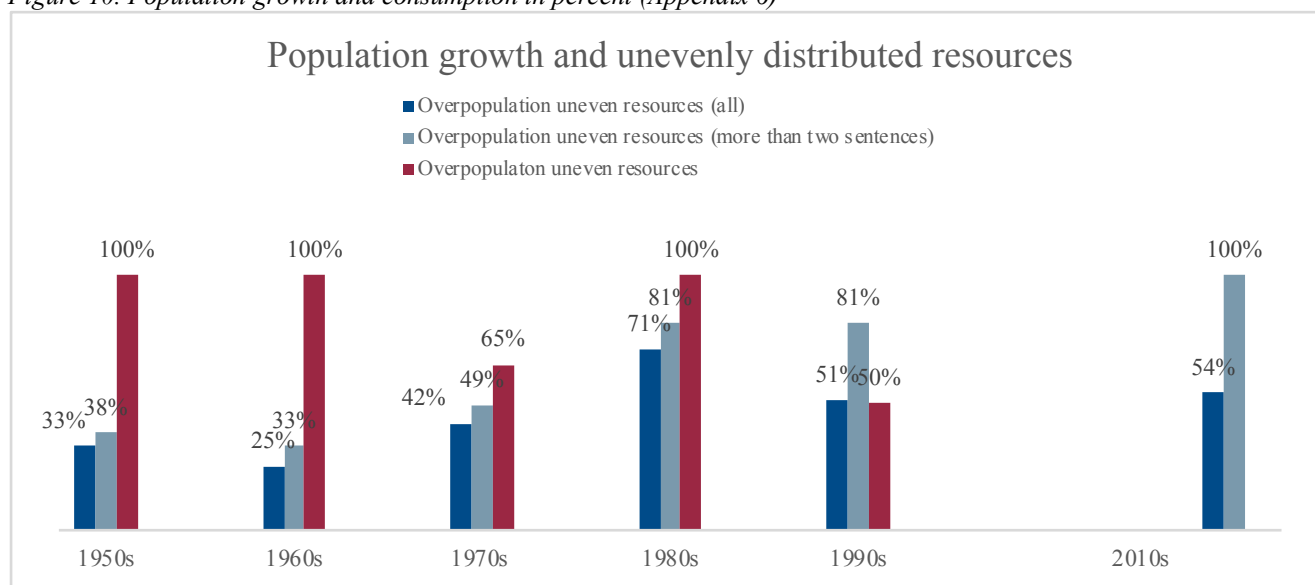


Figure 11. Population growth and unevenly distributed resources, or unevenly distributed pollution (in percent of articles mentioning population growth) (Appendix 6)

Amount of articles are **1950s** category 1: 12, category 2: 8, category 3: 2 articles, for **1960s** category 1: 12, category 2: 9, category 3: 3 articles, for **1970s** category 1: 58, category 2: 40, category 3: 21 articles, for **1980s** category 1: 30, category 2: 16, category 3: 5 articles, for **1990s** category 1: 38, category 2: 22, category 3: 11 articles and for **2010s** category 1: 11, category 2: 2, category 3: 0 articles

The last figure (12) in this section shows the distribution of articles which contain some kind of suggestions of solution for the problem of population growth.

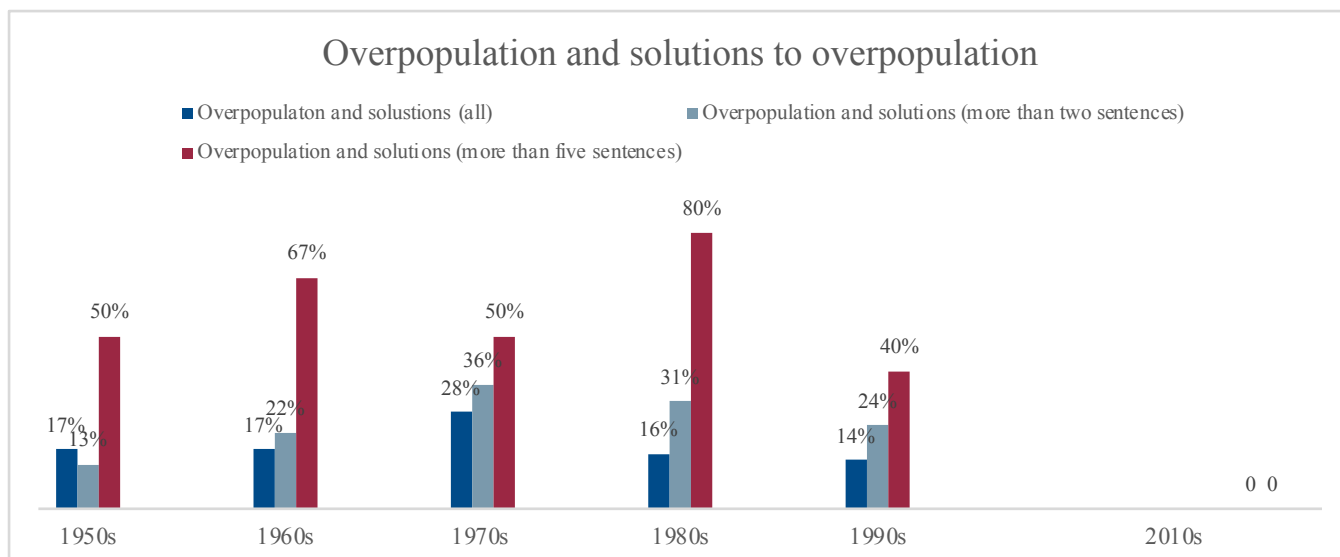


Figure 12. Population growth and solutions (in percent of articles mentioning population growth). This diagram show that the majority of articles in some way mentioning population growth do not suggest a solution to the problem. Most of them do consider it a problem. A few mean that something could or should be done about it but not specifying what, and only a few of them, the amount shrinking during time, do suggest solutions. (Appendix 6)

The amount of articles are **1950s** category 1: 12, category 2: 8, category 3: 2 articles, for **1960s** category 1: 12, category 2: 9, category 3: 3 articles, for **1970s** category 1: 58, category 2: 40, category 3: 21 articles, for **1980s** category 1: 30, category 2: 16, category 3: 5 articles, for **1990s** category 1: 38, category 2: 22, category 3: 11 articles and for **2010s** category 1: 11, category 2: 2, category 3: 0 articles

There are eleven articles published 2014-2017 which in some way mention population growth. As can be seen in the appendix 3, 4, 5, nine of these eleven articles contain only one sentence regarding population growth, while two contain at least two sentences. And for all the four years, 46 percent of these articles which do acknowledge population growth, or a growing population in a global sense, still do not regard population growth as a problem. 46 percent is higher than in any other decade (second comes the 1990s in which eleven percent of the articles do not regard population growth as a problem).

Articles 2014-2017

The articles mentioning population growth published between 2014 and 2017 are:

1. 2014 (1): "Living Environmentally Friendly in India" (translation of "Leva miljövänligt i Indien") by Louise Wileen Bjarke

"It is difficult to bring environmental awareness to the Indians. We are overpopulated and have an enormous poverty. People make their own priorities."

2. 2014 (4): "Exodus from the Open Landscape"

(translation of "Uttåget ur det öppna landskapet" by Ann-Helene Meyer von Bremen.

"In the [governmental] investigation of competitiveness it is assumed that the demand for food will increase as the population and well-being grows on earth. Likewise, the interest is believed to increase for food-security, health issues and knowledge about the production conditions. This should be a benefit for the Swedish farmers, which is highlighted by the LRF, but in the progress-report they do not believe in this, which is a sign of a particularly sober view"

3. Yearbook 2015: "Small village with Big Dreams"

(translation of "Liten by med stora drömmar") by Anna Axelsson

About an isolated village in India, which manages by itself by use of solar energy. "The Indian government faces the twofold challenge to expand power-nets or separate solutions for all of those who are living without access to electricity today, and to secure a safe power supply for the entire country. But with a growing population, growing economy and thereby growing emissions of

carbon dioxide, the industrialized countries pose increasingly stringent demands on India to start reducing emissions.”

4. 2015 (3): “Changing carbohydrates into protein” (translation of “Förvandlar kolhydrater till protein”), not signed.

“In a growing population, there will be more [people] which will have to fight obesity and heart diseases, new inventions in the food sector must have properties that counteract this. But there are many who do not want to change their eating habits, which makes it important to be able to offer products which taste and feel just like people are used to, but are more nutritious and healthy than before.”

5. 2015 (4): ”Giant Leap for Africa?” (translation of Stort språng för Afrika?) by Mats Hellmark
” Two thirds of the population south of Sahara, 621 million people, completely lack access to electricity and the area’s total consumption of electricity is smaller than Spain’s. Urbanization, population growth and economic growth make the need for electricity in Africa increase by four percent each year, according to calculations by International Energy Agency. According to the report Power People Planet by Africa Progress Panel the present situation provides the continent with an opportunity to take the leading position when it comes to developing sustainable energy”

6. 2015 (5): ”Threatened Life beneath the Surface ” (translation of “Hotat liv under ytan”) by Ylva Johnson

“One possible explanation for the decreasing fishing stock is a growing population which uses new fishing methods”

7. 2016 (4) ”The Right Jane for Tarzan” (translation of “Rätt Jane åt Tarzan”) by Mats Hellmark

An interview with Jane Goodall: “For the nature and the ecosystem globally she sees three main problems: extreme poverty which makes people cut the last trees in desperation. Unsustainable lifestyle in the rich world. ‘Population growth. We are so many today. The last thing is hard to do anything about. But I also see that the consciousness about the vulnerability of the ecosystems increases among the youth. Johan Rockström argues that we are approaching a point where we are many enough to change the development. The most important message I would like to mediate is that every individual influence every day. We have a choice’, says Jane Goodall.”

8. 2016 (5): ”The Doomsday Vault” (translation of “Domedagsvalvet”) by Ivar Andersen

” Threatened biodiversity. The population of the earth is growing. The climate gets warmer. 75 percent of the biodiversity of agriculture is gone. Our food supply is facing a seemingly unsolvable equation. Deep inside the permafrost of the Arctic is an attempt to a solution”

9. Årsbok 2017:” Good Soil Carries Itself ” (translation of “Bra jord reder sig själv”) by Marit Larsdotter and Oskar Sonn Lindell

10. ” In 2015, the UN found that the state of the earth’s fields was so depressing that the year 2015 was designated ‘International year of soils’. It was clear that the equation could not be solved: we needed to feed a growing world population by producing more food, while in the same time, exactly that was made harder by the agriculture’s constantly intensifying impoverishment of the earth”.

11. Årsbok 2017 ” How Facts Can Win the Battle” (translation of ”Så kan fakta vinna fajten”) by Marit Larsdotter and Oskar Sonn Lindell

The chips were free and instead of betting on their lucky numbers the gambler was to choose number from questions as “What do you think is the average life span in Pakistan?”, “How many children do you think a woman in Bangladesh gives birth to in average?” and “How many do you think dies in nature disasters today compared to hundred years ago?”

(...)

Far from the correct answers, that the average life span in Pakistan is 66 years, that a woman in Bangladesh gives birth to less than 2.5 children in average and that half as many die of nature disasters now compared to 100 years ago – even though the population is four times bigger”

And

“Climate changes have led to more extreme weather. Still only half as many people die from natural disasters today compared to 100 years ago – even though the population has quadrupled during the same time”

And

“For those who by profession or voluntarily engage it is of course important to know what to work with, and what to arouse opinion for or against. Is it sensible to put effort on birth control in a country in which the birthrate already decreases?”

12. 2017 (5): Concepts Which Change the World (translation of “Begrepp som förändrar världen”, by Sverker Sörlin.

About the history of the environmentalism: ”The concept ‘environment’ was for Vogt a way to tie together this whole diversity of phenomena, including the population growth, which he regarded as the mother of all environmental problems”

Regarding population growth as positive

Article number 2, 2014 (4) “Exodus from the Open Landscape”, and article number 5 2015 (4): “A Giant Leap for Africa” differ from the others in suggesting population growth might be a benefit.

Not regarding population growth as a problem

Article number 11 2017 (5) “Concepts which change the world”. The writer (Sverker Sörlin), implies that William Vogt considered population growth a problem while he, the author of the article, does not. There is reason to question this conclusion though, since the author of the text, Sverker Sörlin, has written about population growth as one of many causes to environmental destruction before, although nineteen years earlier (yearbook of 1995: “The Western society has closed the circle“, translation of “Västerlandet har gått varvet runt”).

Regarding population growth as a problem but not so serious

Article number 10: Yearbook of 2017: “How facts can win the battle”

Referring to a growing population as a problem, although not for the environment

Article number 4: 2015 (3): “Changing carbohydrates into protein”

Regarding population growth as a threat, but we are not able to do anything

Article number 6 2016 (4): “The right Jane for Tarzan”

Five out of eleven articles, which mention population growth, do not consider population growth as an environmental problem (Article number 6 is still considered as one which does consider it a problem, even if pessimistic). This leaves six articles: 2014 (1): ”Living Environmentally Friendly in India”, Yearbook 2015: ”Small village with Big Dreams”, 2015 (5) ”Threatened Life Beneath the Surface”, 2016 (4) ”The Right Jane for Tarzan”, 2016 (5): ”The Doomsday Vault” and Yearbook 2017:”Good Soil Carries Itself”

These articles do mention population growth, but only with one sentence each, except for 2016 (4) ”The Right Jane for Tarzan”, which does refer to population growth in two sentences.

Summary results

The number of articles over time does not follow the trend of the increasing problem of the population growth. And there is a decline in the number of articles with time if looking at articles which contain at least two sentences. Other trends are the focus on toxins, which is high in all categories during the 1960s, the decline in focus on food shortage and erosion with time, and the dominant focus on shortage of resources during almost all categories and all decades. Overall, the questions of global justice apparently increase with time in the articles concerned with population growth. There is also, importantly, a decrease in the ambitions to suggest solutions to population growth (apart from in the category articles containing more than five sentences), and maybe most significant of all: an increase in dismissing the negative consequences of population growth or

population growth itself, as well as an increase in the proportion of articles which do not consider population growth a problem, although both these categories constitute a small proportion of the total amount of articles mentioning population growth. These findings suggest that something changes between the earlier decades and the last decade, which distorts the subject of all three categories. The results from 2014-2017 do not show a clear decrease in occurrences of articles about population growth. But they do show irregularities compared to the articles from the other decades. None of the articles from this last period propose any solutions to population growth (compared to the next in line, the 1990s, in which 14 percent did propose some kind of solution to the problem of population growth). Further, 46 percent of the articles from the 2010s do not regard population growth as a problem (compared to closest in line, the 1990s, during which eleven percent of the articles did not regard population growth as a problem). Even closer examination showed that two out of the eleven articles from the 2010s reasoned about possible benefits of more people globally. In one article from 2015, there are considerations only about the problem with more obesity and other related health problems as consequences of population growth, in another of the eleven articles, it is expressed that the problem of population growth is about to solve itself, and finally one of the eleven articles, the interviewed person says it is not possible to do anything about the global population growth.

Discussion

1. *Categories of silencing according to Diana Coole*

Coole (199:2016) suggests the silencing of the subject of population growth can be divided in five different, but still interconnected, discourses of silencing: “population-shaming, population-scepticism, population-declinism, population-decomposing and population-fatalism”¹⁶. Coole describes the discourses, or distinctions, as analytical and “profoundly political”, that they “overlap or work in conjunction” and that they all share “antipathy to the Malthusian equation between population growth and resource shortages” (196:2016). The first discourse, “population-shaming”, is probably a result of the First World’s attempts to introduce population-control in Third World countries, with methods which were accused of racism and other colonial attitudes. The population-shaming discourse denies that there is “an objective demographic growth problem” and charge neo-Malthusians for “pervasive suspicion that limiting population actually means limiting certain categories of people who are deemed redundant or undesirable” (Coole, 199:2013). It is possible to see aspects of this discourse in a few of the articles in *Sveriges Natur*. One of these articles is “Concepts which change the world” which suggests that the author (Sverker Sörlin) does not agree with Vogt about population growth being an environmental problem. It could also be seen in the two articles which consider the benefits of growing populations: “2014 (4) Exodus from the Open Landscape”, and “2015 (4): A Giant Leap for Africa”, both of them possibly affected by population-shaming, and also the discourse population-scepticism. Coole presents two kinds of population-scepticism: the first one doubts “that there is any longer a population problem since fertility is declining almost everywhere” (202:2016), and the other one is a “political variant (...) that suggests population growth is not detrimental anyway” (202:2016). Probably this is the case with the statement also in article 10, yearbook of 2017 “How facts can win the battle”, and the question: “Is it sensible to put effort on birth control in a country in which the birthrate already decreases?” Concerning this last statement, it might be interesting to know that the fertility rate in Bangladesh is 2.4 while for example the fertility rate in Madagascar it is 4.6. The lower fertility rate of

¹⁶ Diana Coole (2013) Too many bodies? The return and disavowal of the population question, *Environmental Politics*, 22:2, 195-215

Bangladesh most likely is due to women in Bangladesh having access to contraception and safe abortion, which is not the case in Madagascar,¹⁷ which is a reason as good as any for putting effort on birth control in Bangladesh AND Madagascar.

Contrary to advocates of population-shaming, advocates of population-scepticism do not suspect that problematizing population growth necessarily is a sign of a hidden agenda, instead they believe that “contraception and family size will prevail” when a society gets more developed. This is in accordance with the belief in an “automatic” demographic transition (Demographic Transition Theory, DTT) leading to low fertility, almost by law. However, this has not been fulfilled in many countries (Oscar Burger and John P. DeLong, 2016¹⁸ and Martha Campbell and Malcolm Potts, 2012)

The third discourse mentioned by Coole is population-decomposing which “decompose the concept of population into its constituent parts.” This discourse is the cause for us no longer talking about population “as a totality that can be planned and managed”. And this, in turn, “de-politicize”, or “de-problematize” the issue of population growth. Maybe this is possible to see in the declining proportion of articles in *Sveriges Natur*, which discuss population growth as a whole, and the increasing proportion of articles which focus on local situations, like China, India etc, or even on local areas within nations (*figure 13*).

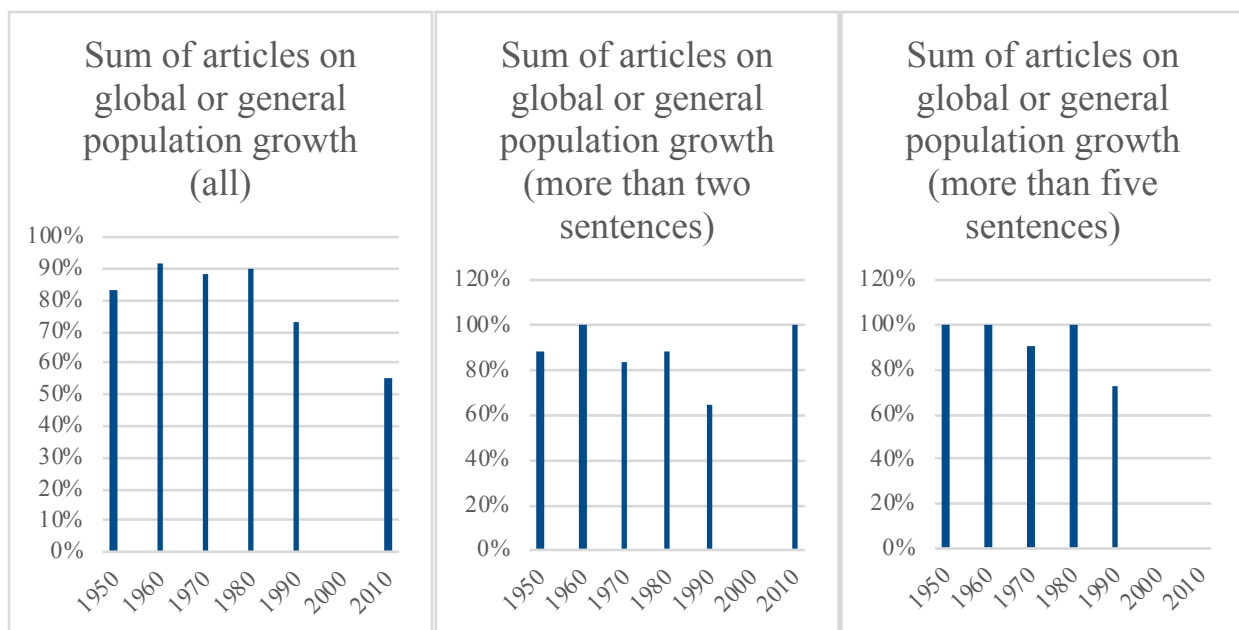


Figure 13: The decline in discussions of global population growth in favor of discussing local or national population growth shows in the first and last category. What looks like an increase in the diagram showing articles with at least two sentences, might be a result of distortion following too few posts during the 2010s (only two in 2010 for this category). This diagram does not give a complete picture though, since many articles mentioning population growth in a non-relevant way, i.e. articles about population growth on small islands etc have been dismissed as irrelevant for this study. This means that only articles considering local population growth actually are about local population growth which affects the global situation, as stated in the method-part.

¹⁷ Campbell, Martha and Potts, Malcolm, December 20, 2012, Do Economics Have Frequent Sex? A flawed paradigm confusing coincidence with causation, Population Press, <https://populationpress.org/2012/12/20/do-economists-have-frequent-sex-by-martha-campbell-and-malcolm-potts/>

¹⁸ Burger, Oscar and DeLong, John P., (2016), What if Fertility Decline Is Not Permanent? The need for an evolutionarily informed approach to understanding low fertility, Philosophical Transactions B, The Royal Society Publishing

2. *Reasons to be cautious*

In the academic world, there exists currently no “politically acceptable discourse” for the issue of population growth, Coole writes (196:2013). Coole, and also Campbell (242:2007), point out reasons for this. Coole mentions the question about eugenics from the time around the 1920s with a peak in nazism during the 1940s when “degenerated” were sterilized (201:2013). In *Sveriges Natur* there is one article which refers to racial characteristics in connection with population growth, issue 3, 1951 “Human and Nature” (translation of “Människan och naturen”) by Holger Erdtman. An extract: “(...) Human can, by her intelligence, at least for a transition time create decent conditions and stay above famine. Though this happens only at the expense of nature, which she reshapes, and this can only happen if science constantly rush before population growth. This [the population growth] can be controlled by intelligent actions. But the question is, if an artificial limitation can prevent a disaster in the long run. There is still too little knowledge about which effect a natural mitigation of the struggle for existence has for the racial laws.” Coole also mentions Theodor Roosevelt’s presidential condemnation of families (of European background) which only had two children, in fear of a “race suicide” among anglo-saxons in favor of immigrants of other ethnicities who presumably had higher birth rates (202:2013). Coole describes how mass famines at times were presented by “colonial administrators as salutary checks on over-population” (200:2016). Family planning programs got entangled in “geopolitical interests” (Coole, 200:2016). The US aid to India was conditioned by the Johnson administration to reduce the Indian population, which might have been idealistic as well as political (reduce the amount of people prone to become communists) and with family planning programs in which “respect for human rights was noticeably deficient” (Coole, 201:2016). In Bucharest in 1974, programs and propositions for reducing the global population was seen as “neo-colonial and racially-motivated while accusing the West of blaming population growth for poverty rather than recognizing the international capitalist system as the principal cause of under-development” (Coole, 201:2013). When it comes to the one child policy of China, the picture is not entirely clear. Apparently, it has been coercive, and it has been accused of abuses of the human rights, still it is not clear if the policy is the reason for the skewed distribution of sexes with a majority of boys (Loh and Remick, 2016).¹⁹

The causes for the silence on population growth are probably not only historical, but also imaginable consequences from both coercive and milder forms of control. These imaginable consequences of family planning in countries where injustices are large and democratic forces weak (many of the countries with high population growth, the 47 countries “designated by the UN as the least developed countries”²⁰), the consequences might well be that suppressed groups are allowed fewer children, and privileged groups more, that women who are forced by a national administration to have fewer children, will on the other hand be forced to have more children by their family or their local communities, with reprisals from both parts. Girls might be treated worse than they are treated now, especially if (by accident or not) a girl and a boy are to compete for food, attention, education etc in the same family, which is the case in for example Afghanistan²¹. On the other hand, Campbell writes, that “social and cultural pressures (...) appear to have little influence on women in settings where contraception is easily available” (244:2007). And “Some controls are kinder than others”, Garrett Hardin writes (294:1993). But

¹⁹ Loh, Charis and Remick, Elizabeth J. 2015. China’s Skewed Sex Ratio and the One- Child Policy. *The China Quarterly*, 222, pp 295-319 doi:10.1017/ S0305741015000375

²⁰ World Population Prospects: The 2017 Revision – Key Findings and Advance Tables

²¹ Nordberg, Jenny, *The Underground Girls of Kabul, in Search of a Hidden Resistance in Afghanistan*, 2014, Random House Inc.

some controls turn out not to be controls at all: “For instance, simulation models indicate that the reduction in fertility rate resulting from providing available contraceptives to women who want them will result in an absolute reduction of CO₂ emissions similar to that resulting from implementing available technologies but at a cost that will be almost five times lower (...).” (Mora, 5:2014). Campbell refers to the Cairo conference’s “focus on examples of coercive family planning while nearly ignoring the coercion of women forced into unwanted childbearing” (237:2007).

There is control everywhere at this moment, in a chaotic and disparate way. Erdogan encourages Turkish women to have more children. In areas in Afghanistan particularly, and many other places, a woman’s value is measured by how many children she gives birth to²². A life of not having children, or only girls, might make a woman’s life disastrous, regardless of if she herself wants children or not. Or, as Campbell puts it: “high fertility is not due to women’s desire to subject themselves repeatedly to the extremely dangerous process of childbirth” (245:2007). What is now called population control, by aid-programs in terms of family planning, might, if successful, mean cancelling of a more coercive control which many women are exposed to. The ultimate argument is that if population growth continues (or actually, if we are not able to successively lower the human population on earth), things will get worse for the women affected. Environmental destruction does far from hit us in a fair and equal way.²³ History has shown that population issues have not always been used for idealistic purposes, but instead sometimes as an excuse for geopolitical interventions or racism and discrimination. It is easy to understand that the population issues are regarded with mistrust by many. Previous abuses as well as the risk for new kinds of misuses must be addressed in order to handle population-related issues. Population control must be arranged with care, especially in countries or areas characterized by inequality and/or non-democratic forces. Finally, it all boils down to the question of who is to tell whom to do what. Can I advise a woman in the third world on how many children she should have, while, in the same time, having a free choice myself? In many cases women do not want to have too many children themselves, but are forced to by different circumstances. In situations like these, the ethics concerning population control are less complicated, but in other cases: can I tell somebody to reduce her number of children for the sake of the environment, while still having the possibilities of limitless consumption myself? There are many interesting humanities theorists to study when it comes to these kinds of issues, maybe in particular post-colonial feminists, Chandra Talpade Mohanty as one example, and it should be done, because nevertheless, overpopulation is one of the causes to many of the most urgent environmental problems we have.

Lately, there have been occasions in Swedish media on the subject of population growth’s effect on the environment: Therese Uddenfeldt, a Swedish writer mentioned the problem with population growth in “*Idévärlden*” (SVT, March 4, 2018)²⁴, and a radio show, “*Dystopia*” (*Sveriges Radio*, May 11, 2018), the models by IPCC was mentioned, in which population growth (as well as consumption) is said to be the cause for emissions of greenhouse-gases. This maybe means that there is hope for a new, constructive and more visible discussion on this subject.

Conclusion

By an examination of the articles in *Sveriges Natur* 1950-1995 and 2014-2017, trends have been shown. The main conclusions from this work are: 1. concerning the frequency of articles,

²² Ibid.

²³ Motesharrei, Safa, Rivas, Jorge, Kalnay Eugenia, 2014, Human and nature dynamics (HANDY): Modeling inequality and use of resources in the collapse or sustainability of societies, *Ecological Economics*, Volume 101, May 2014, Pages 90-102

²⁴ Idévärlden, 4 mars 2018, <https://www.svtplay.se/video/17164734/idevarlden/idevarlden-sasong-2-avsnitt-8>

the hypothesis was confirmed. In the average frequency diagrams, two out of three categories showed a decrease in articles about overpopulation with time. For the category which contains all articles, the trend does decrease, but only compared to the number of articles from the 1970s - 1990s. In this category, compared to the amount of articles in the 1950s and 1960s, the number of articles increased during the 2010s.

Concerning the sub-hypotheses posed in the introduction part, it was shown that:

- a. the distribution of articles about population growth in *Sveriges Natur* corresponds to the escalating population growth over time with a probability of only 0.05. The attention for population growth in *Sveriges Natur* does not covariate with the global population growth over time.
- b. Over time, the articles about population growth in *Sveriges Natur* clearly change views on which environmental problem population growth (mainly) causes. Erosion, toxins and lack of food are considered problems caused by overpopulation more frequently during 1950s – 1970s than during later decades, while lack of resources connected to population growth show a small increase over time, and biodiversity connected to population growth show a clear increase with time.
- c. Over time, a change in the political background for the discussions about population growth in *Sveriges Natur* has been shown. Articles considering, but dismissing, population growth and articles considering population growth but still not regarding it as a problem increase in number (although both these groups of articles are small). There seems to be an increase both in the group of articles considering overpopulation and unevenly distributed resources and the group of articles considering overpopulation and overconsumption (if not counting the category with at least five sentences about overpopulation which does not show a clear trend in neither of these cases, possibly due to too few articles in this category).

In particular, it shows that the articles from 2014 and onwards, were different from the articles from the other decades. For example, the trend is clear when it comes to the 2010s, and a higher proportion of articles not considering overpopulation a problem, of articles dismissing overpopulation and of articles discussing unequal distribution of resources than in any other decade. Said that, the trends of the articles of *Sveriges Natur* seem to have followed the general international trend of changed and decreased attention to population growth-issues, pointed out by researchers as Diana Coole, Martha Campbell, Garrett Hardin and others.

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