Measuring Environmentalism.

A critique of the EPI and why Gender Equality matters for environmental policy.

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Abstract.

In this thesis, I have criticised the EPI (Environmental Performance Index) and the way state environmentalism tends to be measured. I have scrutinised overlooked aspects of nations environmental policy and tried to bring them to the fore in the hope that these will be used for future environmental measurements. I have also looked at the connection between gender equality and state environmentalism and tried to find empirical, quantitative evidence that show correlations between the EPI and the percentage of women in parliament. This has been done by measuring large quantities of statistical data, and analysing this with the help of qualitative theory, in what is known as a **mixed methods approach** to social science. This thesis does not show any statistically significant correlation between these two specific variables, but shows that there likely a strong connection between gender equality and environmentalism on the whole.

I denna avhandling har jag kritiserat EPI (Environmental Performance Index) och det sätt ett lands hållbarhetspolicy tenderar att mätas. Jag har granskat tidigare bortsedda aspekter av nationernas miljöpolicy och försökt föra dem fram i hopp om att dessa kommer att användas för framtida miljömätningar. Jag har också tittat på sambandet mellan jämställdhet och statlig miljö och försökt hitta empiriska, kvantitativa bevis som visar korrelationer mellan EPI och procent-andel kvinnor i parlamentet. Detta har gjorts genom att mäta stora mängder statistiska data och analysera detta med hjälp av kvalitativ teori, i det så kallade **”mixed methods approach”** för samhällsvetenskap. Avhandlingen visar inte någon statistiskt signifikant samband mellan dessa två specifika variabler, men visar att det sannolikt finns en stark koppling mellan jämställdhet och miljöhänsyn i stort.

Keywords:
Gender Equality, EPI, State environmentalism, correlations, FDI, CIEP, mixed methods social research, co2 emissions, capitalism, ecofeminism, growth,

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List of abbreviations:

UNDP – United Nations Development Program

EPI – Environmental Performance Index

GDP - Gross Domestic Product

HDI - Human Development Index

NGO - Non-Governmental Organization

ENGO - Environmental Non-Governmental Organization

GII - Gender Inequality Index

FDI - Foreign Direct Investment

CIEP – Composite Index for Environmental Protection

EKC – Environmental Kuznets Curve

GFN – Global Footprint Network

Introduction.

Is the world getting better? Looking at the looming climate disaster and the lack of action towards preventing it, it's hard to be optimistic. As a response to decades of snowballing feminist thought, a recent up rise of anti-feminist, nationalist and conservative parties have gained widespread traction in Europe and the US, making us think of the age-old expression "two steps forward, 1 step back." Within this arena, this paper will try to shed some light on two problems at once, and see if in fact, there is a common solution to both the problem of lacking state environmental policy, and the lack of gender equality.

This thesis will be looking at critiquing the EPI, one way of measuring state environmentalism, while also searching for statistical correlations between EPI and gender equality. Furthermore, this author will argue that the problems of gender inequality and environmental degradation are indeed, interconnected. There is a large amount of (eco)feminist theory and research that lends credence to this claim as we will later see. However, it is pivotal to understand that this 'connection' between gender equality and environmentalism should not be understood at an individual level, as it is a structural problem. I.e. while this thesis will argue that having more women in Parliament is generally better for environmental policy, there is nothing genetically about the female *individual* that elicits this connection, but instead it regards what she has experienced during her life. While the majority of the ecofeminist theory connects gender equality to the environment, much of the climate research has surprisingly little to say regarding the links between gender equality and environmental progress. Chalifour, for example, shows in her article how Canada's national reports on climate change (as well as sector specific extensive reports) are remarkably quiet when it comes to gender equality, despite the reports accumulating over 600 pages regarding climate change and its adverse effects. The oppression of 'lesser beings' looks the same whether it relates to women, 'non-white westerners', animals or the planet as a whole (in Griffin Cohen, 2017. P. 241).
There are two main theoretical arguments that will be used to show that there is a connection between gender equality and environmentalism; the first being that women tend to perceive environmental risks greater than do men (Xiao & McCright. 2017; Bord & O'connor. 1997.).

These differences are empirically demonstrated and should be seriously considered, although *why* it is this way is important, it is not the focus of this thesis. Similarly, it is deeply problematic to say that *women* are more risk averse than *men.* This extreme type of generalization is likely to lead to more problems than it does solutions. Even though the data is empirically solid we should bear in mind that the tests are often self-reported, and the majority of these tests were done in America, both of which may be statistically significant factors. Despite the flaws in this line of thinking, the results should be looked at and considered, albeit critically.

The second theoretical argument is that of ecofeminism, and according to ecofeminist theory, there are many reasons to believe these gender equality and environmentalism are interdependent, i.e. they are both part of the large intersectional oppression that has followed in wake of our patriarchal and capitalist structures (Macgregor 2010; Chalifour 2017; Buckingham 2017; Arora-Jonsson 2011). Anthropocentric and androcentric ideals have brought us here, and more of the same isn't capable of tackling the problems it has produced, or as Albert Einstein is famously quoted to have said: "Problems cannot be solved with the same mind-set that created them."

What has been lacking in this debate is clear and empirical evidence that shows this connection, so that economists and politicians can take the research to heart without having to understand the fundamental underlying's of ecofeminist thought processes. Unfortunately, the main body of literature about climate change and gender has been written largely "to lobby for a gender perspective within international politics." And It has been "marred by a lack of data and evidence." (Arora-Jonson. 2011. P. 748).

The goal of this paper is to compare statistics and look for correlations - and said evidence - between state environmental policy and women in political positions (parliament) in a variety of different countries. If a correlation can be found, this will be problematized and tried to be understood from different analytical perspectives. Furthermore, this thesis will look at the effectiveness of using EPI as a way to compare environmentalism.

Research Questions:

- Is the EPI ranking an effective way of discussing national as well as global environmental problems?
- Are the number of women in parliament correlated with state environmental policy?
- What are the potential problems of using indexes to measure environmentalism?

Terms and how they are used in this paper:

Gender: "Gender is not a simple concept, although it is now widely accepted as preferable to understanding differences by sex because sex refers to physical differences while "gender" implies a social condition applied to the biological sex of either a male or a female: the distinctions between males and females are not strictly biological but cultural are as well." (Griffin Cohen. 2017. P. 6)
In this thesis, the use of the term gender focuses on the difference between the social constructs of male and female, and does not assume a gender fluid outlook. Neither will this thesis talk about transsexualism or the need to be inclusive for all diversity, while this problem is important and needs to be addressed, this thesis focuses on the differences between men and women, and how that relation in turn compares to environmentalism.

State Environmental policy: State support for environmental issues. This can be achieved through, for example, ratification of international environmental treaties or perhaps legislative changes in order to adopt greener technology/less emission prone industry.

Ecofeminism: the "Third wave of feminism", a body of thought that holds that environmental concern must be part of feminist ideals in order for it to be truly feminist. Ecofeminism compares the oppression of nature and the oppression of women (not to mention similar oppression) and states that to understand and solve one, we must also understand the other, and that no truly feminist *or* environmental society can be truly fair without taking the other into account. "According to Ecofeminists, trees, water, food production, animals, toxins, and, more generally, naturism … are feminist issues because understanding them helps one understand the interconnections among the dominations of women and other subordinated groups of humans …" (Warren. 2000. P. 2) Ecofeminism holds that there is an intersectional oppression of both women and nature.

Intersectionality: "Usually intersectional analysis deals with race, class and gender … differences based on a variety of issues such as ability, age, ethnicity, racial identity, location, class, education and physical location." (Griffin Cohen. 2017. P. 7.) Intersectionality relates to the idea that these are all separate forms of oppression and should not be compared.

Being sexually harassed in a workplace is incomparable to being racially heckled on a sidewalk or being disproportionally affected by climate change. However, even though these are different issues they can have the same structural base and root cause, furthermore intersectionality is a way of describing the power relations *between* these different groups in society.

Methodology.

With this thesis, several different sets of data will be observed, compared and criticised. The primary data set (which this thesis is focused on) is called EPI and is produced annually by the Yale University and affiliates. The EPI "ranks 180 countries on 24 performance indicators across ten issue categories covering environmental health and ecosystem vitality. These metrics provide a gauge at a national scale of how close countries are to established environmental policy goals." (Wendling et. al. 2018). In other words, the EPI shows how 'well' a country is doing environmentally, based off of environmental parameters set forward in international arenas such as the UN; it then ranks these countries and is able to highlight the nations who are consistent with the international environmental goals, as well as show nations who are not.

Another primary source is data from the UNDP, which has also been used. This data looks at the number of women in political positions of power in different countries, primarily by seeing how many women (percentage of whole) are in the upper house of parliament. This percentage will be used as a 'key indicator' or 'rough average' of a country's gender equality. There are several reasons for using this particular indicator, the first reason is that percentage is easily comparable over multiple countries. Secondly, the high accuracy of the data, names, ages and gender of parliament members is available in *most* of the world's countries. Thirdly, sitting in parliament does equate to *some* political power and agency, regardless of how un/democratic a country may be. Using other cross-national gender equality indexes such as fertility rates, percentage of labour force or even female heads of state might have been effective, however, the data of such measurements is often lacking, its relation with gender equality can be harder to trace, and cultural biases are harder to eliminate (Norgaard & York, 2005. P. 511). Despite potential shortcomings, this author finds that when compared to the

other alternatives, women in parliament is the strongest cross-national indicator of gender equality for this particular research.

Further data sets and graphs from Gapminder and Global Footprint Network have been used as complimentary tools for data comparisons and putting numbers into context. Gapminder and GFN uses partly the same data as both the EPI and UNDP so this author sees no problem in using them to compare and illustrate points side by side to the primary sources (www.gapminder.org) (data.footprintnetwork.org). In order to do this, comparing several datasets will hopefully prove to be insightful.

The qualitative analysis will look at the results from the different data sets and from this emerging point of view criticise the indexes and their efficacy as a tool for comparing state environmentalism. Having both the quantitative data and a qualitative analysis of the results will yield the broadest understanding, at least that is the belief of this author.

The primary data sets (from Yale University and UNDP respectively) will firstly be compared in a statistically significant number of countries (30), in order to find correlations between state environmental policy and gender equality. To do so, the data will be run through several correlation processes, such as bivariate analysis and scatterplots in order to compare it to other data. This will be done using SPSS and using the available data sources cited above. Comparing these data sets is my own work. This author has collected none of these data sets, which means the analysis will be made an of someone else's data, this is known as ***secondary data analysis*** (Bryman, 2008. P. 296).
If there are correlations these will be analysed, discussed and problematized. This problematization and analysis of the findings will be *qualitative* in nature. This means this thesis be using a **'mixed methods'** approach, as in, it will be using both qualitative and quantitative methods. All the data used and correlations made will be quantitative in nature, whereas the analyses *on* the findings will be qualitative. The choice to use a mixed methods approach stems from the research questions. Some of the questions cannot be answered by a purely quantitative point of view, and therefore inspiration has been taken from Martin Marshall who says:
"The choice between quantitative and qualitative research methods should be determined by the research question, not by the preference of the researcher." (1996. P.4)

The 30 countries have been arbitrarily selected, although they were chosen to loosely meet certain criteria. These criteria were developed with the goal of choosing countries with as much variety as possible, while still keeping a certain arbitrary randomness to avoid complete bias. These criteria include choosing countries from all continents; countries with strong varieties in GDP and HDI and countries with large ecological differences. Different culture and religion were also factored in and played part in the selection; the larger variety the better. 30 countries were chosen as it is a number that can yield significant data results; any correlation between variables with less than 30 countries/'data points' greatly increases the risk of the data showing correlation where there is none. Ideally, this study would have been done with all countries, but it was the goal that 30 countries would suffice in giving us a general idea.

Strengths, weaknesses and ethics.

The main strength of this methodology is that there is a *vast* amount of data that would not have been possible for one researcher to collect. Secondary data analysis offers the possibility of comparing these very large sets of data and interpreting them in ways that the original author might not have considered. The immense amount of data is a double-edged sword however, for while it is essential to have large data when making global comparisons and generalizations, the largest weakness of this methodology is that the data is much too large to be understood in detail by one person; and, that can be hugely problematic when using others data. All acquired data has faults and limitations, but when you collect the data yourself, you become more aware of these flaws. When using data collected by someone else, these faults can easily be missed and therefore cause the analysis to be flawed.

There are many different indexes, both regarding environmental issues as well as gender equality. Using 'Women in Parliament' as an indicator of gender equality is not problem-free or perhaps even the optimal way of measuring women's political and social agency in a society. However, this author is aware of no better data to use as a cross-national indicator. Furthermore, the use of the EPI as the environmental index is by no means a universal standard, nor is it flawless or even necessarily the most accurate index. However, it *is* the one that is adopted by several large bodies, such as the World Economic Forum and the EU (https://epi.envirocenter.yale.edu/about-epi) which means it influences a large number of

thinkers and politicians. While widespread usage does lend the EPI credence, understanding the flaws with the EPI becomes of critical importance as it affects large parts of the worlds perspective of the world. If we compare the EPI with another index, such as the CIEP; which is an alternative environmental index which was made by Almeida and Garcia-Sanchez which uses other variables than the EPI to calculate which countries have the 'best' and 'worst' environmental impact. The discrepancies between these two indexes cause the rankings of nations to shift. Looking at Figure 1, we can see the different variables used in the different indexes, having different variables cause fluctuations in nation-rankings that we see in figure 2.

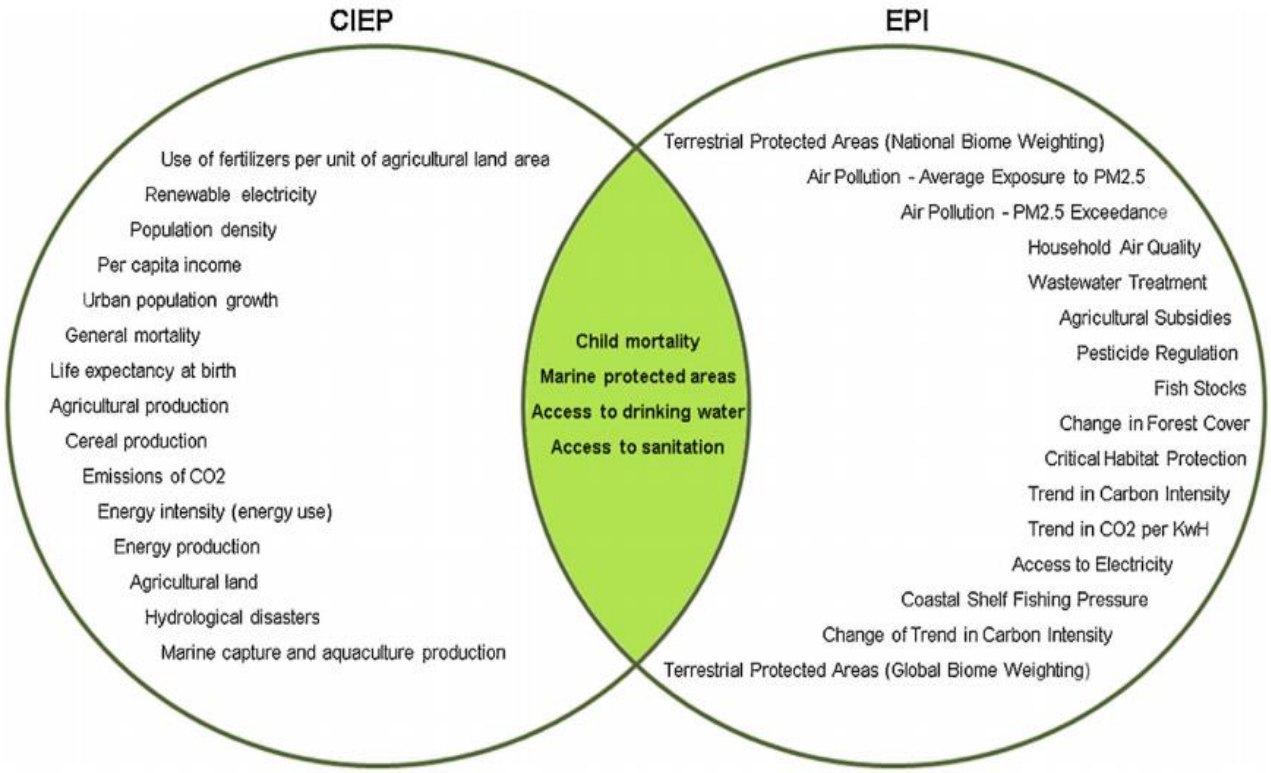

Figure 1. This shows the differences and overlap between the variables used in the CIEP and EPI. *Almeida, T, A. García-Sánchez, I. 2016.*

Table 7
10 Lowest and 10 highest variations of positions classification between the CIEP and EPI ranks.

Country	CC	CIEP (Rank)						EPI (Rank)						Sum	Aver
		Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6		
10 Lowest variations															
Norway	NOR	3	3	4	3	4	3	2	2	2	2	2	3	7	1.167
South Africa	ZAF	123	124	124	127	127	125	124	125	125	125	125	125	7	1.167
Cameroon	CMR	108	111	109	110	110	112	108	109	108	109	108	109	9	1.500
Ireland	IRL	38	35	33	31	31	32	39	37	34	35	35	34	14	2.333

Figure 2. Lowest and highest rank variations between EPI and CIEP. *Almeida, T, A. García-Sánchez, I. 2016.*

"On average, the individual variation rate is 21% and the standard deviation is 0.18, however, there is a country that had a large difference in classification in the CIEP and EPI ranks for the same period, and thus, the highest rate is 86%. On the other hand, some countries were in the same position in both indexes." (Almeida, T, A. García-Sánchez, I. 2016. P. 69).

It's therefore important to understand that while the EPI is an effective tool, it's by no means the only way of measuring environmental progress, and, depending on which index you use, a country can have widely different rankings. If we look at Libya in Figure 2, it's CIEP ranking (in year 1) is 17, while it's EPI rank in the same period 121, that is an enormous difference and will change the readers outlook on which nations are the world environmental leaders. This should be understood when we go forward, and this perspective should be critically applied before we cast any judgement on the different countries and their environmental policy.

While the EPI has many strengths in its multifaceted scoring system, an inherent weakness lies in assuming that we can quantify all environmental aspects and problems. This may be problematic for several reasons. Primarily, it assumes that our current knowledge of environmental problems is sufficient enough to quantify environmental issues into numbers, which it may not be. These potentially flawed numbers can then be used to rank the different countries based on factors which are blind to social, cultural as well as historical differences different countries face, creating a biased ranking.

Due to this thesis working primarily with quantitative data in already established large data sets, this author feels that there is little ethical concern regarding the use of this data, as it cannot be traced to any one individual. As always, one has to be careful with generalising as interpretations of the data may be wrong and cause lacklustre analysis that may affect the people whose lives this data regards to.

Epistemological and ontological concerns.

Epistemology.

Quantitative data is inherently positivistic in the way data is collected and given validity. Given that we can collect data from different societies and countries and then make generalisations such as 'the environment has gotten better', this assumes that human society follows the same rules - and can thusly be approached in the same way – as nature and the natural sciences. This thesis, however, will not take such a positivistic position, but will instead argue from a *critical realism* point of view, i.e. a position sitting between interpretivism and positivism. Bryman writes:

> *"A **realist** epistemology that asserts that the study of the social world should be concerned with the identification of the structures that generate that world. Unlike a **positivist** epistemology, critical realism accepts that the structures that are identified may not be amenable to the senses. Thus, whereas **positivism** is **empiricist,** critical realism is not."*
> *(2008. P. 692)*

In order to find correlations, one has to have specific parameters that is the yardstick which all variables in the paper are compared to. When we say things such as 'state environmental policy has improved', we mean that they have improved in relation to the yardstick we are using, however, the world is diverse and different countries have different pre-conditions (and varying opportunity). Furthermore, the EPI follows a set of rules which are based on certain ideals and values. Criticism can be, and has been, lifted towards the indices used in the EPI (see Umweltbundesamt, 2008). In their analysis, the Umweltbundesamt (the German Federal Environment Agency) say that "composite indices are as a matter of principle rather not suited to reflect the complexity of performances and policy developments... ", lending credence to the idea that we need to be critical of common yardsticks. Assuming that all

nations can be compared using the same criteria is at best problematic, and at worst, deeply unfair.

Ontology.

Adopting an objectivist point of view might be possible when discussing environmental problems, however it would assume that there is a definite and clear answer to environmental problems, and that we *agree* on what the problems are, and that these are somewhat universal. Constructionist theory tells us that we can only understand nature through social constructs, e.g. the distinction we make in the world between 'society' and 'nature' is in itself, a social construct. Furthermore, what is 'environmentally friendly' is something that changes depending on current science, and is thus, bound by cultural/societal context. Examples such as Freon or Asbestos come to mind, which were at the time lauded as environmentally safe, but have since then been shunned. Going even further, depending on if you are a proponent of, for instance, 'green growth' or 'degrowth' will dramatically impact what you consider to be environmentally friendly. To conclude, using a non-objectivist point of view we can see that the definition of what nature *is,* and how best to save 'it', become blurry. Therefore, this author believes that critical realism is an important view to take for this paper. This means that, ontologically as well as epistemologically, this paper positions itself between objectivity and constructivism.

Constructivism is needed to criticize the 'common yardstick' we are comparing the nations with. However, pure constructivism argues that we cannot consider any part of nature excluded from Culture/Society and therefore, trying to understand 'nature' solely on its own becomes a fruitless endeavour. A purely constructivist point of view is therefore problematic as there are real, measurable, climate catastrophes on the horizon that we wish to avert, and so we need to find a middle ground.
When looking through the lens of critical realism, we can admit that there *is* a difference between the social and natural, but we need to have a firm grasp of the social context in order to understand our concept of nature. There *is* a nature and environment, but there are many different ways of looking at it and understanding it. Solving the environmental problems which have arisen and will continue to arise moving forward will require a variety of different perspectives, and a one-size-fits-all solution will not most likely not work. It is the hope of this author that that this stance will offer a more critical and reflexive view on the data and the possible correlations they show.

Theory.

Gender Equality and its relation to State Environmentalism.

There are two primary standpoints that have been researched by social and environmental scientists that help us look at the connection between gender equality and environmentalism from two different angles. The first stems from the fields of social psychology, political psychology and environmental sociology. Researchers from these fields show that women tend to generally have a higher risk assessment when considering environmental problems. In other words, there seems to exist a gender gap regarding environmental concerns, values, as well as perceptions of environmental risk (Bord & O'Connor. 1997). Furthermore, this seems to be the case pan-nationally (Norgaard & York. 2005). Bord & O'Connor's research finds that women who are asked to assess risk of environmental dangers from a range of potential hazards (such as toxic waste or nuclear power) tend to see the dangers as greater than do men. Their research further suggests that women are more likely to support environmental treaty ratification than are men.

The second angle stems from a group of researchers from various fields, describing their research as 'ecofeminism'. This growing body of research asserts that environmental degradation, sexism (and indeed all other similar 'isms') are interconnected processes. Ecofeminist theory tries to explain that there is a common hierarchical social structure that devalues both women and nature simultaneously, and asserts that our (primarily western) societal values, institutions and economic systems are in fact gendered, which means that sexism and environmental degradation are *mutually reinforcing* processes (Merchant 1980; Seager 1993; Norgaard & York. 2005).

Both of these above-mentioned fields of research, suggests that our society is structurally degrading to women and 'nature', while also showing that women in general show a greater understanding for environmental risks. In sum, if more women were to be added to a country's parliament, or generally to a country's higher echelons of power, many of the scholars point out that it would logically follow that a nation's masculinist structures would likely be weakened, and the women in these positions - if following the trend observed in the research - would vote in favour of averting environmental catastrophe more often than their male counterparts, which would - in theory- create a more environmentally friendly nation.

Hence, looking at gender equality could be argued is an important factor when determining a nations environmental policy.
Xiao and McCright's (2017) research point in this direction. They state that women (in the US) are slightly more worried about environmental degradation due to women generally having slightly higher risk perception. They claim that framing an environmental problem as having health risks to family, community, and the individual is more likely to elicit a response from women than men. Finally, they say "...[w]omen may be more likely than men to support those public policies meant to protect or conserve environmental quality that are couched in terms of minimizing or managing risk." (P. 181) Their conclusion is similar to that which Bord and O'Connor wrote:

> *"All this research demonstrates a consistent pattern: surveys that include items triggering risk perceptions, including environmental risks, find women expressing more concern than men ... Women's reactions to perceived risk tend to be more homogenous than men's."*
> *(Bord & O'Connor. 1997. P. 833).*

This indicates that there is a gendered dimension of environmental concern, namely that - even when controlling for a large quantity of variables - risk perception alters one's view of the environment, and gender affects one's risk perception. (Xiao & McCright. 2017. P. 182) This thesis will not try to explain *why* women have a greater risk perception than do men, although it is an important piece of the puzzle. What is of crucial understanding to this research, however, is that in the vast majorities of studies between the 1970s and 1990s, women take health risks more seriously than men (Bord & O'Connor. 1997). This has enormous impacts on environmental policy, as men dominate the arena where environmental policy is decided, while generally being less perceptive of the environmental risk and dangers that exist (Arora-Jonsson. 2017).
Arora-Jonson cautions from drawing too grand conclusions from this fact, however. In her article, she states that the societal structures themselves are gender-biased and simply "adding women and stirring" won't help the foundational problem (2017. P. 295). Many of the environmental groups are led by men; women who have been introduced have had to accustom to the already existing culture, as opposed to being allowed to reorganize the structure to allow for gender diversity. This is one reason why looking at female politicians is a "better" way of measuring gender progress than looking at number of women in for example ENGOS.

Looking at the institutions and structures that produce these international treaties and environmental plans, we can see that they are heavily dominated by men and are built upon a 'masculine' ground, which rewards a macho-culture and subdues minorities and women, so even though simply adding more women won't be enough, it will be a good start (Buckingham P. 393). These masculine structures can be seen if one tries to work with/in ENGOs for example; the hours are often 'unsocial' - requiring people to work many extra hours and the positions are often limited time term contracts that make it difficult for anyone raising a family, which overwhelmingly affects women (Buckingham. 2017. P. 392).
In other words, those people who are most likely to change environmental policy for the better, are the ones who are the least likely to be offered a position. Therefore, the first step must be to introduce more women to these positions, the importance of having women and marginalized groups in positions of power is vital if we wish to combat these structures.
Furthermore, combating these masculine structures is also of importance for environmental policy, Buckingham puts it eloquently:

> *"The fields that dominate climate-change decision making, whether as an entirety (economists, politicians, civil servants, climate change activists) or in its component parts (transport, energy, waste management) are heavily dominated by professional men who, by virtue of their status in society, are precisely those most able to evade its impacts." (P. 390)*

In other words, those who are benefitting from positions of power are least able to see the consequences of environmental problems and "lack the epistemic privilege" to understand the problem fully. And, if one does not fully understand the scope of a problem, we cannot expect that person to properly address it (Buckingham. 2017. P. 400).
While it is a good start, those women who *do* make it in the male-dominated structures of ENGOs and state politics, likely do not have dependents to care for, or are wealthy enough to hire help in this field, removing precisely the epistemic privilege that is needed in order to change the current system (Buckingham. 2017.).

State environmentalism and capitalism.

So far, while the theory points in a certain direction, very little quantitative empirical work has tested whether gender equality does in fact influence state environmental behaviour. This thesis will present some quantitative data towards this goal, and Norgaard & York has some rather compelling evidence in their research from 2005.

TABLE 2: Predictors of Environmental Treaty Ratification (Ordinary Least Squares Regression)

Independent Variable	*Coefficient*	*Standard Error*	*Beta Weight*
Women's representation	2.46**	.73	.21
GDP per capita	4.30**	1.22	.30
Percentage GDP in service	.90	.58	.11
Foreign direct investment (percentage of GDP)	–9.12*	4.51	–.12
Official development assistance (percentage of GDP)	–2.85	2.27	–.09
Capitalist	31.29*	13.02	.14
Percentage urban	.26	.34	.06
Ln (population)	20.27**	3.86	.30
Political freedom	4.44*	2.05	.16
Constant	–458.42**	73.10	
R^2	.69		
N	130		
Mean variance inflation factor	1.86		
Highest variance inflation factor	2.82		

*$p < .05$. **$p < .001$ (two-tailed tests).

Figure 3. Image taken from Norgaard & York. 2005.

In Figure 3, the results from Norgaard & York's data are shown. They have compared the number of women in parliament with the amount of environmental treaties ratified by national governments. They have also compared these numbers with other data to check for similar correlations (such as FDI, GDP per capita, political freedom etc). The model shows that "… [s]ocieties with greater representation of women in [P]arliament are more prone to ratify environmental treaties. In fact, the gender variable has a stronger association with state environmentalism than any other factors except per capita GDP and population…" (Norgaard & York. 2005. P. 512). The results further show that political freedom, economic development, capitalism and population all have significant positive associations with state environmentalism. This is important to note, as one common ecological argument is that

nations follow an ecological Kuznets curve (EKC). The EKC is usually described as follows: a nation typically follows a curve where during pre-modernity they do very little environmental damage, then emissions increases with modernity, and finally environmental degradation decreases again once a certain level of 'modernity' or 'progress' has been made (Stern, 2003). While there is much critique already levelled toward the EKC, the numbers from Norgaard & York also show that gender equality is correlated with environmentalism *even when* controlling for factors that we typically connect to 'modern society' (such as freedom of speech, political freedom etc). Thus, gender equality is correlated with environmentalism even in non-capitalist and 'non-progressive' states.

Furthermore, there are two paradoxes that are worth mentioning when discussing capitalisms positive environmental effect. They are Jevons Paradox, and the Paperless Office Paradox. Jevons noticed that as the industry efficiency of coal use increased (i.e. ability to produce as much as possible for as low a price as possible and still make a profit,) it allowed for more goods of coal to be produced, which meant that total coal consumption increased. The paradox lies in where one would assume that when efficiency is increased, less would be needed, but when less is needed, the demand for the product goes up. This means that for as long as we have progress within industrial efficiency, demand for the product is likely to increase. (York. 2006).

The Paperless Office is a slightly more recent paradox by Sellen & Harper, and refers to the idea that in the beginning of the 21st century, when more computers and the world wide web were readily available in offices, people assumed that paper use would start to diminish. However, use of paper increased even though alternatives (such as email and electronic documents) became more easily available. Indeed, when e-mail became available, paper usage increased by as much as 40% in certain places (Sellen & Harper. 2002. P. 12). Thus, these two paradoxes show that as technology advances, industry efficiency is likely to increase, however, this means that *more* of the polluting product(s) will be able to be made, and alternatives won't cancel the use of the polluting product completely, as industrial efficiency makes the product cheaper.
Between the data provided and these two paradoxes, an environmental Kuznets curve seems implausible.

Similar to this, many will argue that both gender equality *and* state environmentalism are products of a more 'modernised' society. There is some credence to this argument, since the figures show that capitalist nations are significantly more likely to ratify more environmental treaties. However, the significance of this finding should also be interpreted with some caution, since there is also ample evidence to show that development and modernisation leads to environmental degradation (York, Rosa, & Dietz 2003) and there is a *substantial* amount of research that indicates that capitalism is ecologically unsustainable (Foster, Clark & York 2010; O'Connor 1998; Schnaiberg & Gould 1994, Daly & Farley, 2010).
Mies and Shiva also criticises capitalism but focuses on its structural problems and its relations to gender and environment, they write:

"The neglect of nature's work in renewing herself, and women's work in producing sustenance in the form of basic, vital needs is an essential part of the paradigm of maldevelopment, which sees all work that does not produce profits and capital as non or unproductive work."
(Mies & Shiva. 1993. P. 4)

Thus, contributions from the natural environment are invisible under capitalism as they do not produce profit. Equally, women and the reproductive work they traditionally and pan-culturally do in the home and for society is also undervalued as it usually is not monetized. This brings us back to the original point that these two forms of oppression are both interconnected, as capitalism is built on an inherent hierarchical pyramid structure where (white) men are at the top and all other beings (and nature) are oppressed below them.

Furthermore, Norgaard & York's data shows that FDI has a significant *negative* correlation with state environmentalism, meaning that the less FDI a nation has, the more likely they are to ratify environmental treaties. This negative correlation between FDI and state environmentalism is something that other recent research has shown as well (Jorgenson 2007; Grimes & Kentor, 2003).
Although this is slightly outside the scope of this thesis, understanding that a nation with less FDI ratifies more treaties than nations with more FDI is important to consider as this affects the majority of the world's nations, not least the capitalist ones.
A large amount of the FDI in developing countries is invested in environmentally inefficient (not to mention labour-intensive) manufacturing. The techniques for generating power in poorer nations - generally - are significantly less eco-efficient than equivalents used in

developed countries (Grimes & Kentor, 2003; Jorgenson, 2007;). For example, if we were to open up an oil refinery in two countries with vastly different GDP (e.g. Norway and Sudan), the richer country will likely have access to more advanced machinery and stricter environmental laws (as well as stronger protection agencies to enforce these laws). This will in turn make the richer nations' industry more efficient, and thus environmentally 'friendly' than in poorer nations.

Furthermore, western countries such as Sweden export digital and low-carbon products while importing high-carbon products from other countries. Therefore, Sweden is able to keep its own co2 production down while continuing to stimulate growth. When accounting for only domestic products, Sweden has low emissions per its GDP. However, this story changes if one was to account for all the goods consumed, domestic *and* international.

"Some call this progressive national politics that leads the way in the global combat against climate change and climate mitigation. Others would simply call it an obvious asymmetry that outsources its environmental problems while claiming moral superiority on the issue of climate change" (Hultman & Anshelm. 2017. p. 27).

The argument becomes age-old, but as poignant as ever; can the environmental crisis be solved with capitalist values? The body of ecofeminist researchers tend to believe that no, we cannot solve the problems that have arisen *because* of capitalism (environmental degradation, gender inequality, exploitation of animals and nature), with more of the same. What happens when all nations reach western levels of income and consumption? Where will the high-carbon products be imported from when no one wants to make them?

Looking at the two aforementioned paradoxes and shown arguments, it's hard to see how for example 'green growth' will solve our current crises, and perhaps we should be looking for an alternative to capitalism on the horizon (Schalk, Gunnarsson-Östling & Bradley, 2017. p. 447; York. 2006).

Cosmology and the belief in growth.

The idea that growth will be our saviour despite the mounting evidence to the contrary, is perhaps deeper rooted than we might initially think. How we measure environmentalism depends on what we deem to be environmentally sound.

Matthews speaks about the underlying beliefs that affect our society as well as how we see our society and its effect on nature. We all have a cultural cosmology, a sense of how nature and the world works that has been passed down culturally. This cosmology deviates more or less from how the world scientifically works (Matthews. 1994). For example, we may believe that rain is the tears of sad deities, or we may have a general idea of how water dissipates due to heat and is cooled by the atmosphere which causes rain. These two different cultural views influence our perspectives of how nature and the world functions, and even in the latter case of the two examples; we may not understand the finer details of how every water particle travels from the earth to the sky and back again and so even if our cosmology is based on scientific thinking, there are many beliefs that we take for granted that may only be partly correct, or even totally incorrect.

Our current cosmology is a religion of human inventiveness and a belief in that the 'green economy' will 'save us'. These cosmological beliefs may not have the scientific backing that the majority of people ascribe to it, i.e., hoping for a Christian saviour or a technological 'magic bullet' may be equally likely. This belief may well be hindering us as a society from facing up to the problems that we are currently creating, for we collectively seem to believe that there will - with enough innovation and growth - be a 'magic bullet' solution to our environmental problems (Bowie. 2000. P. 121). This cosmological belief in growth and the economy has other far-reaching consequences that tend to 'pass under the radar'. For example, according to Seagar, the 2-degree climate goal is - contrary to popular belief - not based on a scientific and/or environmental consensus, but is instead based on the economist Nordhaus' findings from 1979 (Seagar. 2009; Oppenheimer and Petsonk. 2005). The 2 degrees reflect the tipping point at where economic growth and environmental policy 'meet' according to Nordhaus. In other words, the 2-degree climate goal is not environmental, but economic first and foremost. One could argue that this would not have happened had not the cosmological zeitgeist, and the political arena, been so dominated around the central principle of growth being a positive outcome.

The professor of economics Richard Tol agrees with her in his analysis and concurs with that the 2 degrees are more economical in nature and not based on scientific, environmental reasoning. He writes: "This target is supported by rather thin arguments, based on inadequate methods, sloppy reasoning, and selective citation from a very narrow set of studies." He

finally concludes that "Overall, the 2C target of the EU seems unfounded." (Tol. 2007. P. 424)

However, not all are convinced that capitalism and environmentalism are at odds with one another. Indeed, many environmental economics foresee a future where more or even all aspects of nature are commodified, where the free market will eventually settle on the right price for such commodities; these include potential things such as visiting national parks, clean air, polluting rights, or intellectual property rights of medicinal plants (McAfee. 1998). McAfee writes: "By promoting commoditization… the global environmental-economic paradigm enlists environmentalism in the service of the worldwide expansion of capitalism." (1998. P. 134) Thus, environmentalism can easily become a tool and reason for further development of the capitalist system, a problem that can be solved by commodifying 'nature'. When nature has a price and the free market has access to it, the magic of markets will solve the environmental issue by its own accord. Consequently, if we continue with our current societal trajectory, looking at amount of commodified land may be increasingly important when measuring state environmentalism.

Data results.

EPI and gender equality correlations.

Michael Randall
Lund University

Using the EPI data from Yale university and UNDP's data for 'percentage of women in parliament' I have made a simple scatter plot of our 30 countries using the two data sets. The data ranges from 0 to 60% (of women in parliament in a given country, in 2017) on the X-axis, and from 20 to 100 EPI 'points' on the Y-axis. No outliers have been removed. By observing the scatter plot we can see that there seems to be no significant correlation, although a weak positive trend can be discerned.

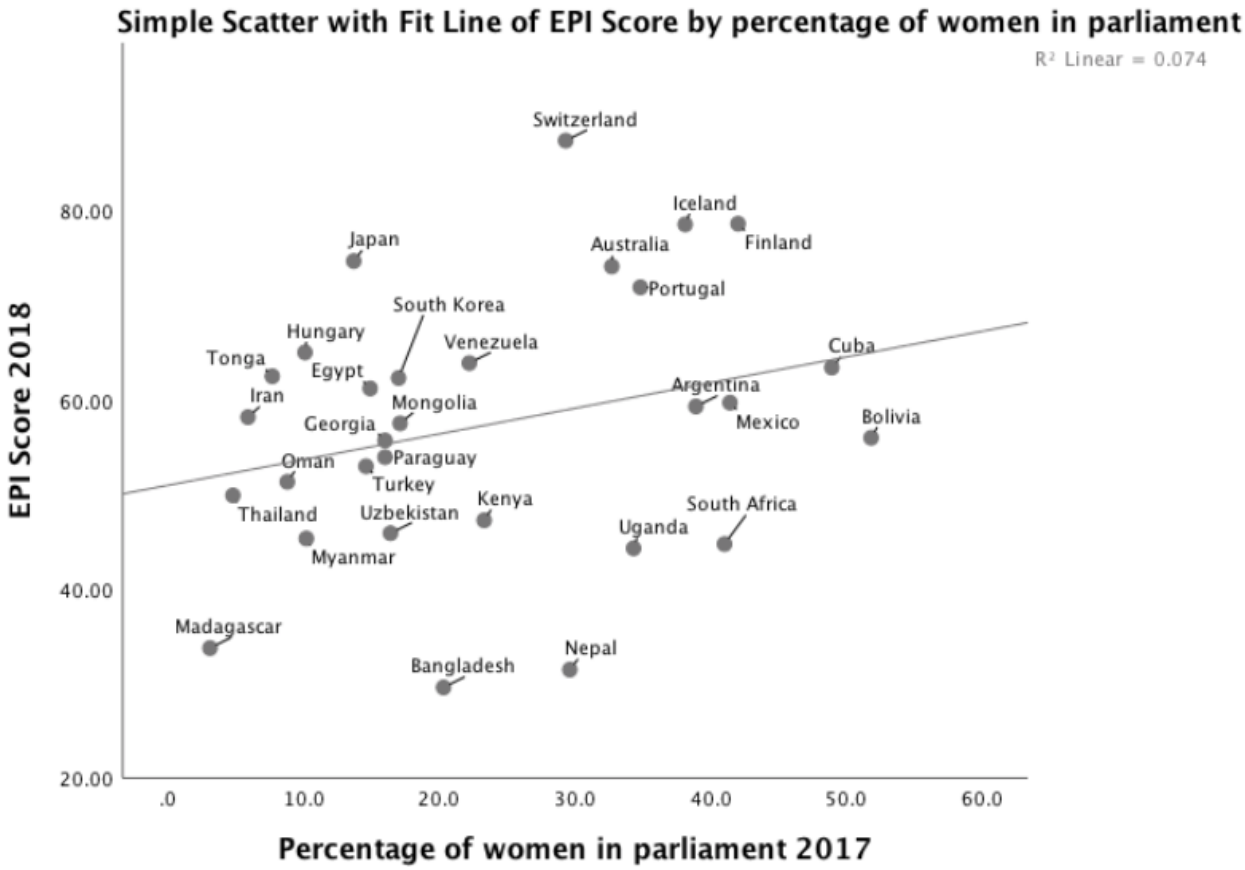

Figure 4. SPSS

Using bivariate analysis (a tool that helps us find and quantify empirical correlations) to look at these numbers, we can glean a couple of things. Firstly, that there *is* a positive relationship; that means that when one variable increases, so does the other. The second and more important point is that the variables are *not* significantly correlated. This correlation has been

tested using a two-tailed test, which allows us to check if there is either a positive or negative correlation, and the correlation has been tested using both Spearman's rho and Pearson's R, the two most frequently used equations that measure the 'strength' of a correlation.

		Percentage of women in parliament 2017	EPI Score 2018
Percentage of women in parliament 2017	Pearson Correlation	1	.272
	Sig. (2-tailed)		.146
	N	30	30
EPI Score 2018	Pearson Correlation	.272	1
	Sig. (2-tailed)	.146	
	N	30	30

			Percentage of women in parliament 2017	EPI score 2018
Spearman's rho	Percentage of women in parliament 2017	Correlation Coefficient	1.000	.233
		Sig. (2-tailed)	.	.216
		N	30	30
	EPI score 2018	Correlation Coefficient	.233	1.000
		Sig. (2-tailed)	.216	.
		N	30	30

Figure 5 & 6. Pearson's R and Spearman's rho calculated to check for correlation. SPSS

'Pearson's R' compares the number of times two variables intersect, and ideally, to prove a correlation, we would want a number as close to 1 as possible (to prove a perfect correlation). Our number '0.272' = 27%, and is closer to 0 than 1 thus and indicates no statistical correlation. In order to check our answers, we also test for Spearman's Rho, which uses the same scale (-1 to 1) and we see that the correlation according to this method is equally weak

(0.233 = 23%). Comparing our findings to a table of 'critical values for Pearson's r', it states that in a 2-tailed test (such as ours), N = 30 (where 30 is the number of countries chosen, and thus, the amount of data points we have), which means that statistically the margin of error is 0.296 = 29.6%. I.e. if we ran this example 100 times with 30 (different or the same) countries, 29.6 of these examples are likely to produce a correlation larger than ours simply by chance rather than there being an actual correlation. This is a problem of having a small sample group; if we would have made a correlation analysis of more countries, the margin of error would have been a smaller number.
If we look at the coefficient of determination (R squared), the effect size of the correlation is ca 7.4%. This means that with knowledge of one of these variables (e.g. women in parliament), we can predict the other variables (EPI) movement to a 7.4% accuracy, which leaves a large 92.6% unknown.

So, in sum, as it stands we cannot rule out that the correlation presented above has happened because of statistical chance, and potentially shows no actual correlation. However, with more data (i.e. more countries) we could reduce the margin of error. While our current correlation is weak, and shows no statistical significance, there *could* still be statistically significant correlation, given more data.

This result doesn't imply that there is no correlation between e.g. percentage of female politicians and environmental ratifications, or between other gender equality data (such as the GII) and co2-emissions, it simply means that there is no strong correlation between these two specific variables (women in parliament and EPI). Looking at Figure 7, we can see a list of all the variables and at what percentage they affect the final EPI score, when considering that the EPI factors in some 25 different variables within its own score it is not surprising that a single variable such as 'Women in Parliament' doesn't affect the EPI strongly.

Policy Objective	Issue Category	TLA	Wt.	Indicator	TLA	Wt.	Page
Environmental Health HLT (40%)	Air Quality	AIR	65%	Household Solid Fuels	HAD	40%	5
				$PM_{2.5}$ Exposure	PME	30%	6
				$PM_{2.5}$ Exceedance	PMW	30%	7
	Water & Sanitation	H2O	30%	Drinking Water	UWD	50%	9
				Sanitation	USD	50%	10
	Heavy Metals	HMT	5%	Lead Exposure	PBD	100%	11
Ecosystem Vitality ECO (60%)	Biodiversity & Habitat	BDH	25%	Marine Protected Areas	MPA	20%	12
				Biome Protection (National)	TBN	20%	13
				Biome Protection (Global)	TBG	20%	15
				Species Protection Index	SPI	20%	17
				Representativeness Index	PAR	10%	18
				Species Habitat Index	SHI	10%	19
	Forests	FOR	10%	Tree Cover Loss	TCL	100%	20
	Fisheries	FSH	10%	Fish Stock Status	FSS	50%	21
				Regional Marine Trophic Index	MTR	50%	23
	Climate & Energy	CCE	30%	CO_2 Emissions – Total	DCT	50%	29
				CO_2 Emissions – Power	DPT	20%	30
				Methane Emissions	DMT	20%	31
				N_2O Emissions	DNT	5%	32
				Black Carbon Emissions	DBT	5%	33
	Air Pollution	APE	10%	SO_2 Emissions	DST	50%	34
				NO_x Emissions	DXT	50%	35
	Water Resources	WRS	10%	Wastewater Treatment	WWT	100%	36
	Agriculture	AGR	5%	Sustainable Nitrogen Management	SNM	100%	38

Figure 7. A list of all the EPI variables and their percentage 'weight'. Wendling, Z. A., Emerson, J. W. Esty, D. C. Levy, M. A. de Sherbinin, A. et al. (2018).

In fact, I would argue that 7.4% could be seen as a surprisingly high percentage due to the many variables within the EPI. Though we must not forget that with 30 countries the critical value is higher than our correlation, and an analysis such as this needs to be done on more, and/or different countries to see if this correlation holds true or if it is simply a chance accident due to the number of, and which countries that have been chosen. Furthermore, a more effective way of understanding this correlation would be to compare 'women in parliament' individually with all the EPI variables to see where its effect is strongest/weakest. In the following chapter I will argue that while this correlation is small, when seen in a greater context, while it may not be *statistically* significant, it may be *socially and economically* significant.

The reasons for this weak correlation likely has a multitude of reasons. Using Gapminder as a secondary analysis tool we might glean some additional information. The size of the 'bubbles' in the Gapminder charts relates to the population size of the country and the colours relate to the continent where the country is located; light blue is Africa, red is Asia (including the continent of Australia), yellow is Europe (including Russia) and green is North and South America.

The EPI, as mentioned, consists of 25 different indicators that together make up a total score and when calculating its percentage from the whole, a nation's co2 emissions counts as 12.6% of its total EPI score.

Looking at these two datasets from Gapminder (figure 8 & 9), one being a 'timestamp' from 1990 (i.e. data from that particular year), and the other from 2014, they relate to *all* countries where data is available (and not just the 30 countries listed in our above example) and compare countries' co2 emissions with the percentage of women they have in their parliament.

Observing the graphs (Figure 8 & 9) shows us that there is little to no correlation at all between co2 and 'women in parliament', even less than in our previous example. This might actually help us partly explain why the correlation in the previous graph (EPI and 'Women in parliament') is small, despite the theoretical backing.

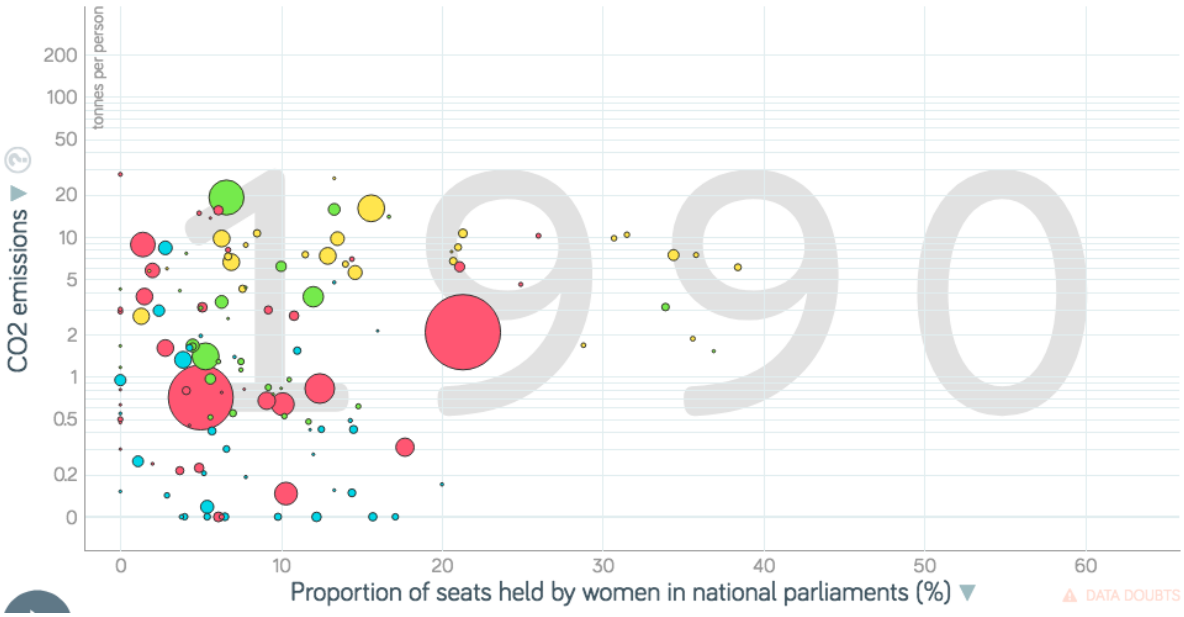

Figure 8. Percentage of women and Co2 emissions globally for the year 1990. *Gapminder.org*

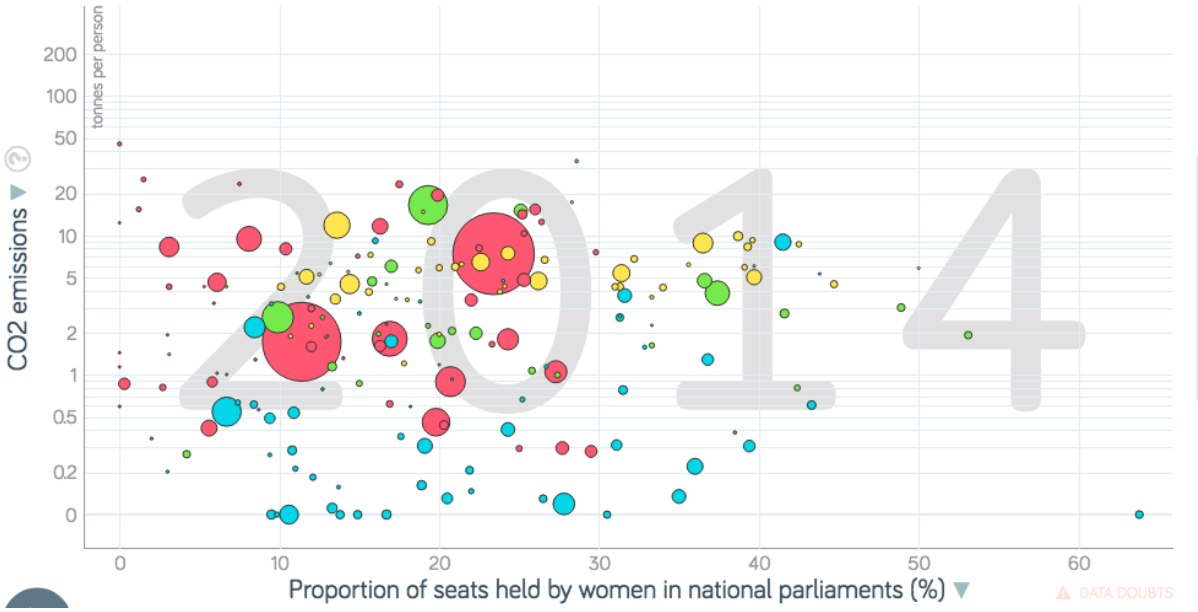

Figure 9. Percentage of women and Co2 emissions globally for the year 2014. *Gapminder.org*

Co2 emissions, the elephant in the room.

Two variables that *do* have a strong, global and significant correlation, however, is individual income (GDP divided by population) and co2 emissions (metric tonnes per person), as can be seen in figure 10. The 'timestamp' is from 2014 and clearly shows that the higher the individual income the population in a country has, the more co2 they emit. Note that this correlation is the same *within* nations, that means, the higher the income of an individual, the higher co2 emissions that person is likely to have (Ourworldindata.org). Looking at these different graphs, one analysis could be that in our globalizing and free market world, co2 emissions have less to do with political policy (and is therefore less affected by gender un/equal parliaments) and has more to do with individual purchasing power. However, we need to look briefly at how co2 emissions are calculated before committing to such an analysis.

Co2 emissions are calculated in a 4-step process; firstly, we look at a country's extraction of non-renewable resources (e.g. coal and oil); secondly, we look at a country's net production of non-renewable resources (i.e. account for imports and exports and look at how much was burned for energy) and finally calculate the co2 emissions based on the 'quality' and type of the resource (ourworldindata.org). Using this method, we can get a fair approximation of a country's co2 emissions. When understanding this process, we might be inclined to re-analyse our above statement and say that political policy actually seems to play the largest role in how

much co2 is produced in a given country, since import and export of non-renewable resources is part of fiscal and environmental policy. Although, it is unclear to what extent free market capitalism would counteract progressive environmental policies in this regard, which would, once again be an argument for looking at individual purchasing power as the main driver of co2 emissions.

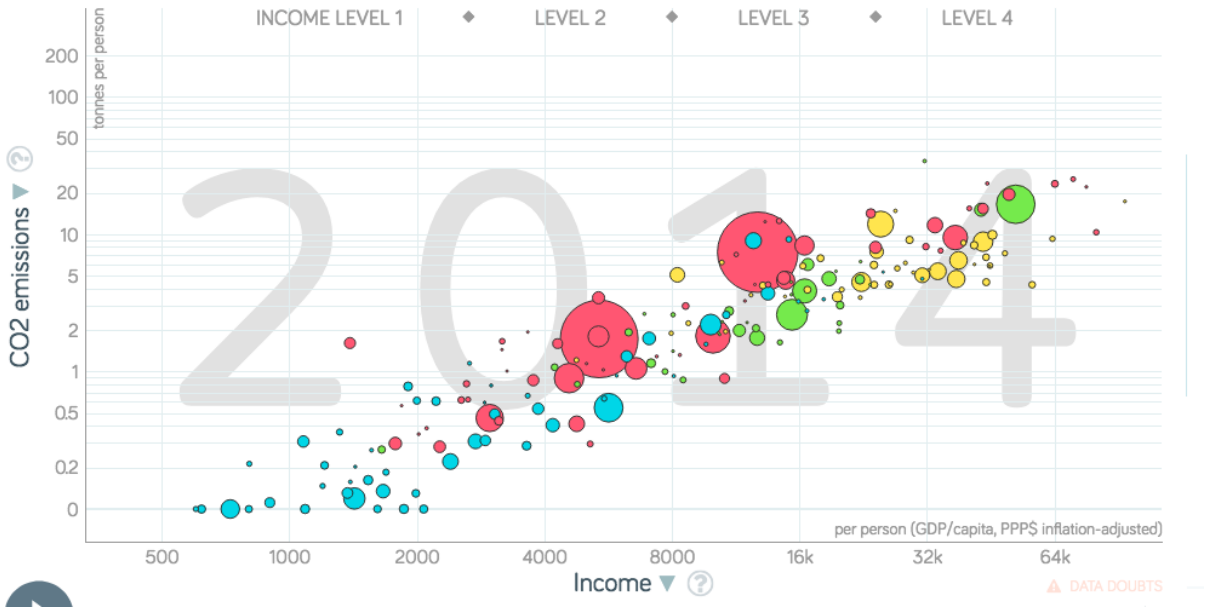

Figure 10. Gapminder.org

In order to test if co2 emissions is related to only certain types of societies we can put another graph together (figure 11), testing for co2 emissions and 'democracy score'/Polity score. This score is "ranging from -10 (hereditary monarchy) to +10 (consolidated democracy). The Polity scores can also be converted into regime categories in a suggested three-part categorization of "autocracies" (-10 to -6), "anocracies" (-5 to +5 and three special values: -66, -77 and -88), and "democracies" (+6 to +10)." (www.systemicpeace.org) Looking at this graph, we can see that there seems to be a U-shape of sorts where highly democratic as well as autocratic nations have the highest co2 emissions, where the highest amounts of co2 emissions per capita belonging to primarily nations in the middle east (Qatar, United Arab Emirates, Bahrain etc) and 'the west' following after. However, there doesn't seem a clear correlation between a specific type of government and co2 emissions. This is hardly surprising concerning the globalization we see in the world today.

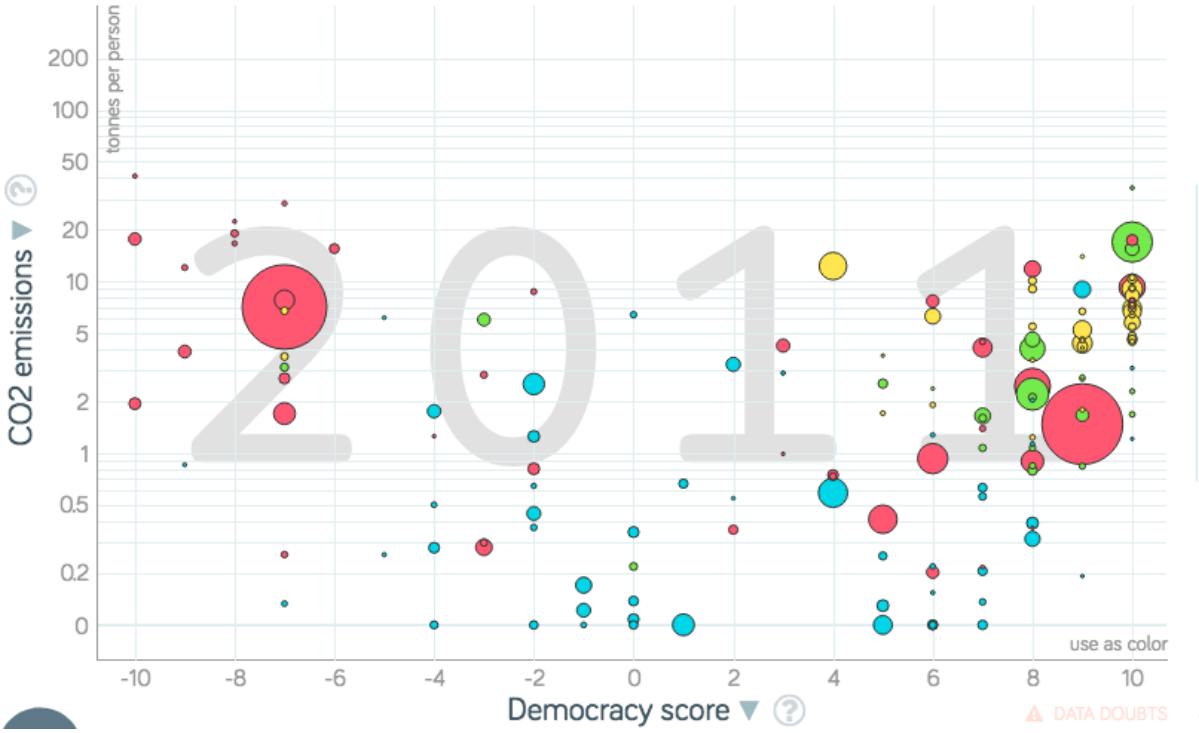

Figure 11, co2 emissions by democracy score year 2011. Gapminder.org

COUNTRY	EPI RANKING	ENVIRONMENTAL PERFORMANCE INDEX	ENVIRONMENTAL HEALTH	ECOSYSTEM VITALITY
Switzerland	1	87.42	93.57	83.32
France	2	83.95	95.71	76.11
Denmark	3	81.60	98.20	70.53
Malta	4	80.90	93.80	72.30
Sweden	5	80.51	94.41	71.24
United Kingdom	6	79.89	96.03	69.13
Luxembourg	7	79.12	95.07	68.48
Austria	8	78.97	86.38	74.03
Ireland	9	78.77	95.92	67.34
Finland	10	78.64	99.35	64.83

Figure 12, EPI top 10. Wendling, Z. A., Emerson, J. W. Esty, D. C. Levy, M. A. de Sherbinin, A. et al. (2018).

Another important factor I would like to highlight is EPI rank when compared to co2 emissions. Looking at figure 12, we can see that the countries with the 10 highest EPI scores are all western European. Looking at figures 8 through 11, we can see that the all of the European countries (yellow) have a co2 emissions value well above the average.
If we draw another chart looking at 'women in parliament' by co2 emissions, but looking at only countries in the top and bottom 10 marked out, we get figure 13 (note that the scale is logarithmic). While the age discrepancy in the data might usually be problematic, data from the European Union shows that co2 emissions from European countries have stayed roughly the same since 2014 (ec.europa.eu), meaning that the numbers used here are relatively fair estimations of 2018.
We should perhaps ask ourselves how big of an environmental problem nations' co2 emissions really are when considering EPI as an estimation of a nation's environmental footprint. When the 10 countries with the highest EPI rank all have the largest co2 footprint (ranging from between 5 to 20 metric tons per person) this warrants criticism. Furthermore, it perhaps follows logically that the 10 nations with the worst EPI score have an extremely small co2 footprint (with the exception of India).

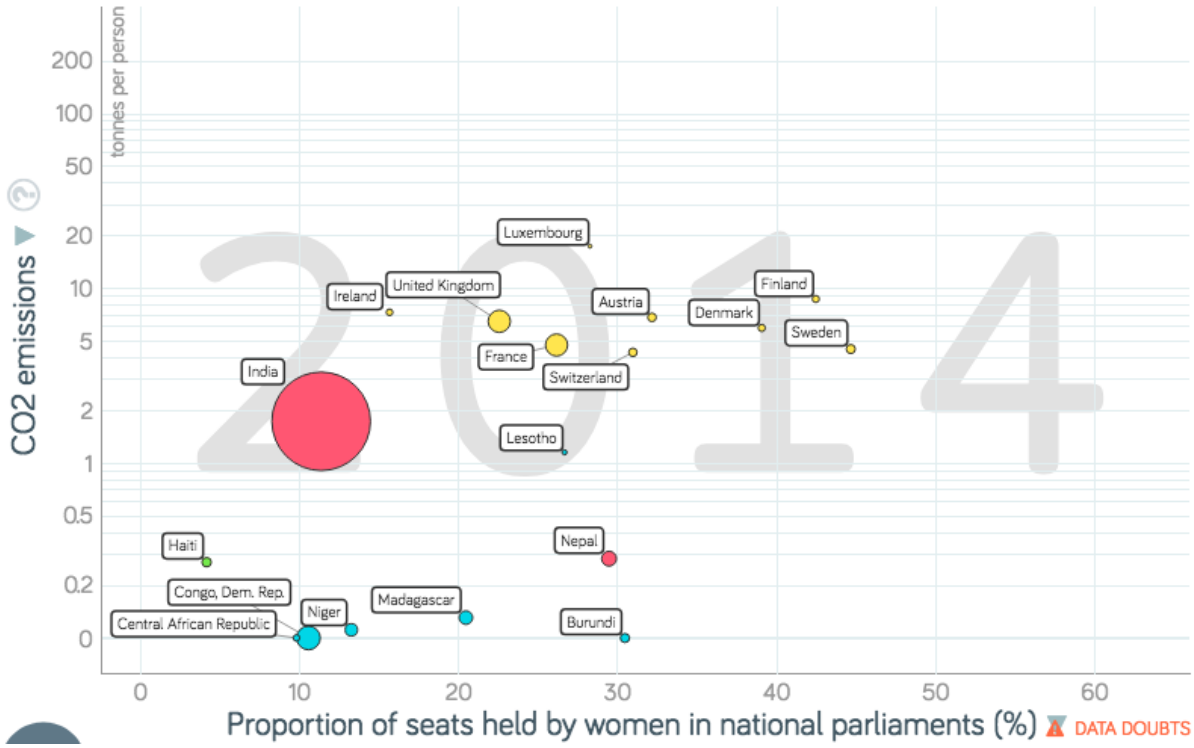

Figure 13. Gapminder.org

The problem is perhaps not the scoring of the EPI, but how the EPI portrays itself as an 'Environmental Performance Index', i.e. an index for how to be as sustainable as possible. On their website, the creators write:

"The EPI thus offers a scorecard that highlights leaders and laggards in environmental performance, gives insight on best practices, and *provides guidance for countries that aspire to be leaders in sustainability.*" (epi.envirocenter.yale.edu/. emphasis added.) This gives the impression that having a high amount of co2 emissions isn't only tolerable, it almost seems to be a precondition for a high EPI score. The take home message from this report then seems to be that all countries should aspire to be like western Europe where co2 emissions are at their highest, and, sub-Saharan African countries where co2 emissions are low have very little to teach us regarding environmental sustainability.

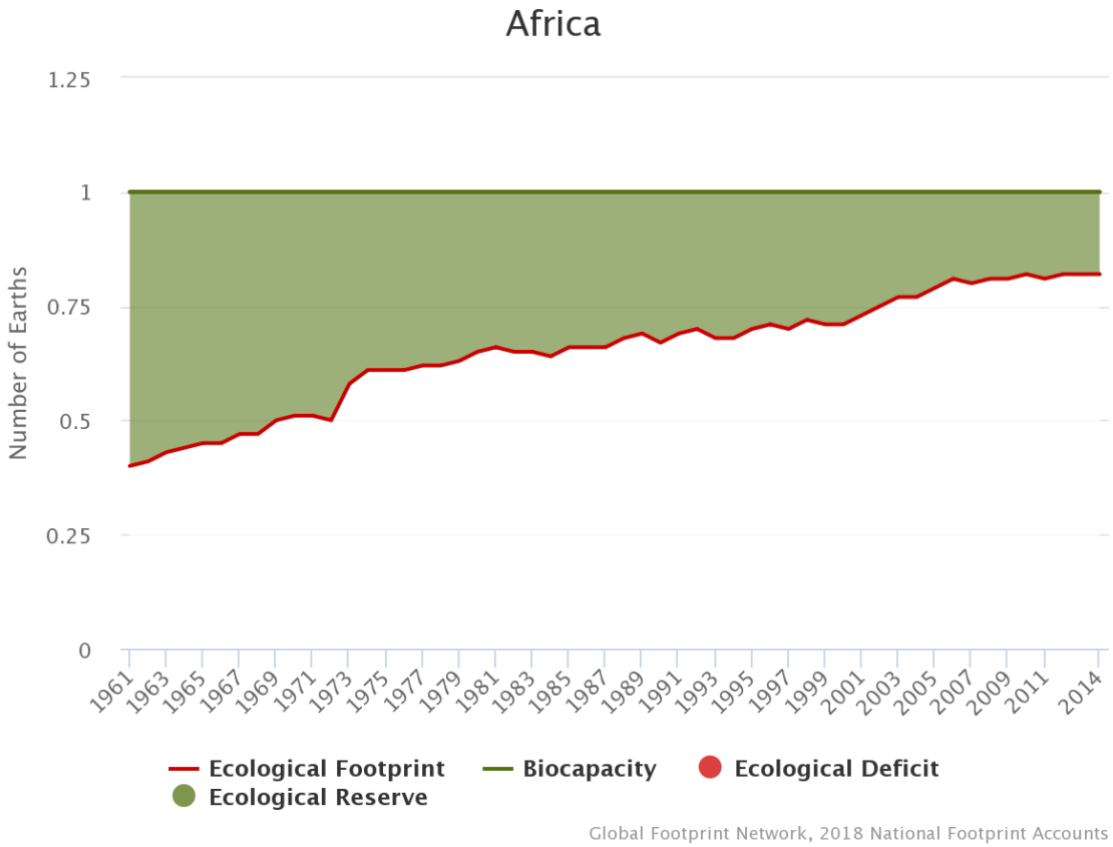

Figure 14, The ecological reserve for the continent of Africa, 2018. data.footprintnetwork.org

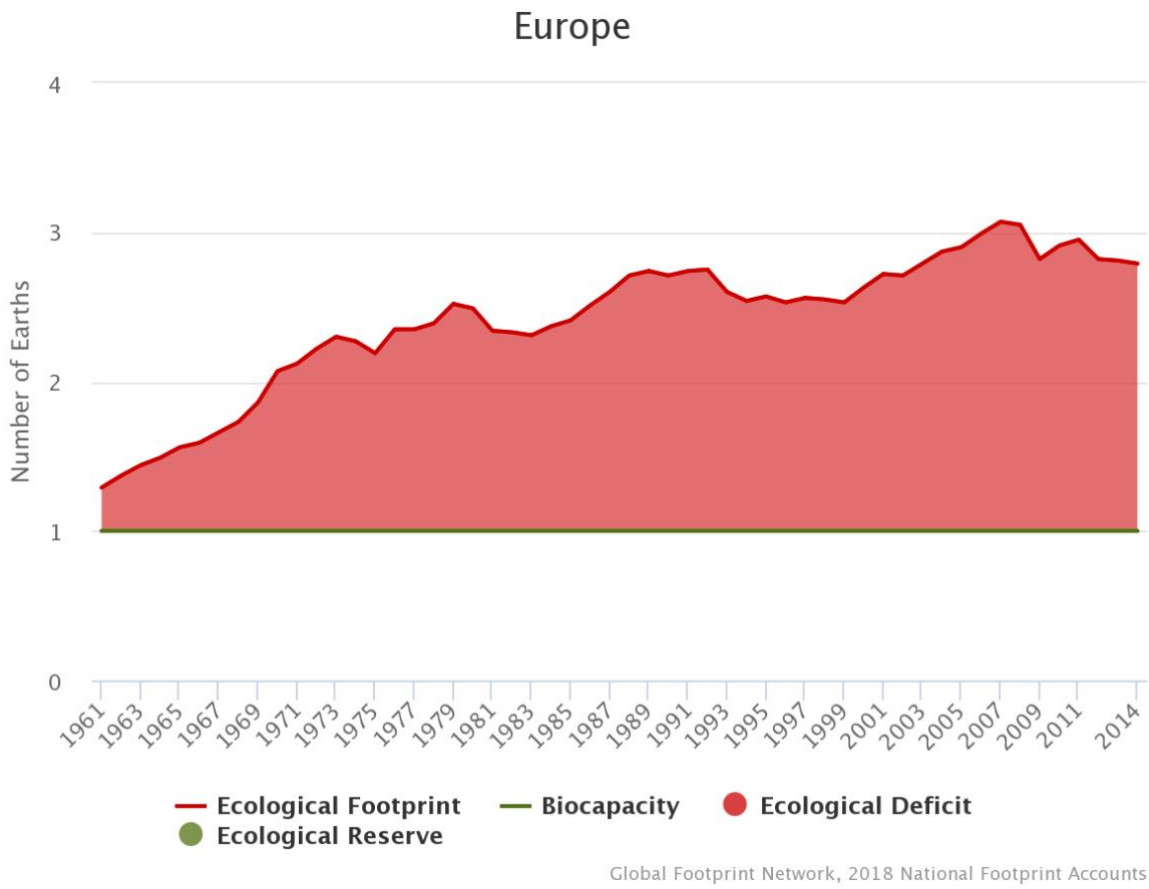

Figure 15, The ecological deficit for the continent of Europe, 2018. data.footprintnetwork.org

To further illustrate this point, two graphs have been taken from the Global Footprint Network which show continents' ecological deficit/reserve (figure 14 & 15). An ecological deficit occurs when the 'Footprint' of a nation's population exceeds the biocapacity of the area available to that population. A 'Footprint' equals "how much area of biologically productive land and water an individual, population, or activity requires to produce all the resources it consumes and to absorb the waste it generates…" (https://data.footprintnetwork.org) Furthermore, a country has an ecological reserve when the biocapacity *exceeds* its population's 'Footprint'. Every nation has a countable biocapacity, and using less than what your country/region can handle means that you have a reserve, and thus will have a 'green' colour in the graph. If there is a deficit (national or regional), on the other hand, the nation/region with said deficit is importing biocapacity through trade or by "liquidating regional ecological assets" (*ibid.)*, meaning they are using up more biocapacity than their region/nation can handle. "Liquidating assets" means that countries are, for example, emitting wastes into the global commons such as the hydrosphere or atmosphere. Note that the scales here, just as in many of the previous graphs are logarithmic and thus not

equal on both sides. The graph shows how Europe has had an environmental deficit since pre-1961 and this deficit seems to be steadily growing, whereas Africa as a continent still has a large reserve of biocapacity. It should be noted that the nations in Africa have an extremely large economic, social and environmental discrepancy and 'lumping' them together to one large body may paint an unfair picture, however, this final graph should not be seen as conclusive evidence, but instead as further critique of how we measure environmentalism. As once again, looking at the EPI which highlights Europe as an environmental leader despite large co2 emissions and a growing biocapacity deficit warrants criticism.

Analysis/Discussion.

Looking at the graphs and at the arguments borrowed from Anshelm/Hultman (saying that high income nations import high-carbon wares and export low-carbon products) it is difficult to understand how the EPI, that places western Europe in the top, contributes to a 'better' understanding of environmental problems. Granted, there are *many* different problems and one might argue that the EPI focuses on some of these and less on others, which would, indeed, be a valid argument. However, the EPI's target is to "highlight leaders and laggards" and "give insight on best practices" (see p. 25, this work), and in that regard, it is hard to agree with the EPI's conclusions. While western Europe may have cleaner industries and better water sanitation, the amount of co2 used per person is barely comparable to the countries of, for example, sub-Saharan Africa. Furthermore, the 'dirty' (i.e. heavily polluting) industries in many of these poorer countries produce wares to be exported to richer European countries. This begs the question, who is really at fault here? To further illustrate "the west's" role in this, these industries are often the result of FDI which - as we saw earlier - is directly and negatively correlated with state environmentalism; meaning that many of the dirty industries are being paid for by FDI money. Thus, we need to look at where this money is coming from, for if I pay you to dig up a resource, but in doing so you pollute your waters and you air, should I or you be held responsible for the pollution?

According to the EPI, the answer seems to be that the country who is *doing* the pollution are the ones that should be held accountable, regardless of who is *causing* it, (i.e. where to money to pay for it is coming from).

So, although Norgaard & York's results show that capitalist nations are more likely to participate in environmental treaties, we should be careful how we chose to analyse this, as there appears to an ironic situation where the nations that cause the largest impacts on the environment, are also the ones that are the most likely to support environmental treaties. And, it appears, the most likely to be causing environmental regress in other countries. With this said, when measuring state environmentalism, we should also consider looking at FDI, both inflow and outflow, and, we should ask ourselves where the blame for heavy-polluting under-developed factories in cheap-labour nations really lie.

Furthermore, looking at figure 10 we can see that there is a near perfect, positive relationship between co2 emissions and income. And as we've seen, the nations with the highest income tend to be the ones that top the EPI; not only does this seem counter-intuitive and needs to be criticised, but, one might be surprised that more emphasis isn't placed on GDP growth when measuring environmentalism because of its strong correlation with co2 emissions. GDP growth isn't considered when looking at a nation's environmental policy, despite it being a *clear* indicator of its future co2 emissions.

If we were to look at the gender equality side of things, the data shows us that nations have generally become more 'equal' over the last decade (Figures 8 & 9), with a substantial increase in female politicians globally. While we haven't seen a quantifiable effect on nation's sustainability, we need to consider time to be a factor. As we stated earlier, "adding women and stirring isn't enough". So, perhaps we should not be too hasty in our conclusions either for or against a correlation. If we compare figures 8 & 9 we can clearly see that a large part of the world's nations has become more gender equal, at least when looking at the number of women in parliament. But perhaps 4 years isn't enough time to affect 200 years of capitalist thought and progression. Perhaps this data should be looked at again in a few years' time in order to see the change that has happened. Hopefully, this is the small beginnings of something large, like a snowball slowly tumbling down the mountainside.

However, perhaps we should consider the opposite. The large increase in female politicians globally may be a result of western ideologies being globally exported as the de facto way to progress as a nation. As we've seen, western nations have the highest points and are hailed as environmental leaders, despite having extremely unsustainable co2-emissions. An interesting argument thus arises, could percentage of women in parliament be seen as an indicator of a nation's 'progressiveness' by *western* ideologies? I.e., the more women in parliament, the more likely the nation will hold western ideologies. Thus, using western Europe as an example to extrapolate from, the percentage of women in parliament could be seen as an indicator of a nation's environmental *degradation*. As argued by ecofeminists and eco-Marxists, capitalism is environmentally unsustainable, if women in parliament is an indicator of progressive/modern capitalist values, then ironically, the percentage of women in parliament may be a precedent of capitalist environmental degradation.

We also asked, in the research questions, if potential correlation could be explained by other factors such as a general progressive state. Looking at the data from Norgaard & York they explicitly state that their data showed correlation even when controlling for GDP, freedom of speech and other values associated with a 'progressive' state. Thus, women in parliament and environmental treaty ratification are correlated regardless of the 'progressiveness' of a nation. Furthermore, the data presented in this thesis agrees with their statement and does not indicate that 'progressiveness' is a causal factor when looking at gender equality and environmentalism. What we have seen is that income is strongly correlated with co2 emissions, and that FDI is correlated with worsened environmentalism. Thus, there are clearly variables that strongly affect a nation's environmental policy but these variables do not appear to affect the gender equality of said nation.

In regards to gender equality and environmentalism, we've seen there is a very small positive correlation between the EPI and Women in Parliament, it is not statistically significant, however. With that said, with the theoretical background and research shown in this thesis, it seems highly unlikely that there is no correlation between gender equality and environmentalism as a whole, and as such, it would be unwise to rule out a connection, despite the quantitative data in this thesis not supporting that conclusion. The theoretical foundation is strong enough to support the idea that these two variables are part of the same problem, and the data from Norgaard & York clearly shows a strong correlation. The reason for why this data doesn't match their conclusion is probably many-fold.

First and foremost, the number of nations observed is too small and the margin of error is too high to make any large generalisations. Norgaard & York's data consisted of all countries where data is available, our first scatter plot features merely 30 nations (Figure 4). Had this experiment been done with all nations, and data had been readily available, the result might well have been different.
Additionally, we may need to critique the way we look at and measure environmental progress and regress; only after we have a better and fairer measurement can we start to apply the idea of how gender equality is related to state environmentalism. As it stands the correlation in this data is insignificant, but *why* is that? It's hard to tell if it is because there is no connection between gender equality and state environmentalism (EPI in this case), or if the way points are distributed within the EPI is contributing to a skewed outlook on what nations

are the most environmentally friendly. With a skewed outlook, it is hard to determine how gender equality correlates.

Let us not forget that the EPI is based on current economic and industrial thought, and therefore certain variables are prioritised higher than others. Looking at figure 7 we can see that nitrogen levels in agriculture as well as SO2 and NOx pollution in the air is ranked with relatively low variable value, despite these emissions being incredibly detrimental to the environment. Perhaps this is because the EPI is built on a capitalist framework that maintains that growth and environmentalism is compatible and can even be mutually beneficial. While this may or may not be the case, it would be an interesting thought experiment if the EPI had been re-designed from an eco-socialist perspective; what variable changes would then have been made within the EPI, and would this, perhaps, affect its correlation with gender equality?

This is a point that should be stressed, these findings are based not on raw data, but on the EPI's *interpretation* of the data. I.e., they have 'decided' the weight to be attributed to each data point. This comparison between women in parliament and the EPI might have been better served if we looked at another environmental representation, however this fact and the limitations of the EPI was known and discussed earlier in this work.
Perhaps looking at a nation's EPI score is the problem to begin with, adopting a more global perspective for a global problem. As we have seen here, western European nations are lauded despite soaring co2 emissions. Looking at the paradoxes mentioned earlier combined with our societal current aim of 'growth at all costs', it seems to validate arguing for a focus on global measurements instead of national ones that are currently on the agenda. It also seems implausible that green growth will indeed offer the solution to this problem, thus further criticising the EPI's ranking and the validity of calling western European nations the most environmentally progressive.
With all this said, I would argue that the reason for the lack of correlation between Women in Parliament and the EPI is that our measurements – in this case the EPI – is not an effective enough tool of measuring state environmentalism, and therefore it needs to complemented by other indexes or ways of measuring that are not gender and culture- 'blind'.

Conclusion.

In conclusion, this thesis has given arguments for why our current ways of measuring state environmentalism are not enough to paint a whole picture of a nations environmental policy, and using for example the EPI as a yardstick can have large political consequences as the wrong 'take-home' message may be sent. The fact that the nations with the lowest co2 emissions are ranked at the bottom and the nations with the highest co2 emissions are ranked at the top should raise some serious questions regarding the veracity of the EPI. This thesis has also tried to give some pointers as to what variables could be included in the future, or that could be used as complementary data to paint a broader and more culturally inclusive picture.

One of the main points this thesis has looked at is gender equality, and questioned its lack of connection to environmentalism. Unfortunately, with the 30 nations chosen for this study, this thesis was unable to provide quantitative evidence of a correlation. However, with the backing shown this is likely due to the way we measure environmentalism and not due to lack of correlation. What is clear is that with 30 nations, the EPI and percentage of women in parliament are not correlated, despite theoretical backing.

This can be seen as saddening news for two reasons. Primarily, empirical and quantifiable evidence that gender equality and environmentalism are interconnected may help us tackle both feminist and environmental problems at once (assuming that there indeed is, a positive correlation). A lack of evidence is likely to lead to 'business-as-usual', which clearly does not seem to be optimal. Secondly, and more importantly, should these results matter? If economists and policy-makers require better results as an argument to invite women to the table of decision-making, what happens if these positive results *don't* materialise? Or if they worsen over time? Are women then disinvited from the decision-making process? Policy-makers should not *need* an economic incentive to invite half the world's population to the table.
As has been stated before, this data should not be interpreted individually, as in 'women are by default more environmentally friendly than men', but instead that a gender equal government tends to be an environmentally friendly one, but where in that chain the causality lies is the important task for future researchers to figure out.

What we *can* say however, is that the link between gender equality and state environmentalism is not due to capitalism or caused by social and/or technological progress (as shown by Norgaard & York. 2005.). Therefore, even if getting more women into politics won't be enough to solve our current crises, it is a vital first step.
Furthermore, strong criticism has been aimed at the EPI, primarily for how it interprets the data available and how the different variables within its points-system are ranked. Arguments have been laid out that show the inherent flaws with the EPI's ranking, these include the questionable notion that western Europe has the majority of the world's most sustainable nations despite their astronomically high co2 emissions, and basing its points system in western ideological thought.

Finally, there seems to be an inherent paradox within the capitalist system where everything seems to be growing; that includes positives as well as negatives. This leads to the paradoxical conclusion that the world is getting simultaneously better and worse.

Further Research suggestions.

If one were to make a similar study again but with all nations where data is available, that would reduce the 'white noise' from the correlation analysis and be able to better prove if there indeed is a statistically significant correlation or not between the EPI and percentage of women. Doing similar studies but with other indexes would also likely yield different results due to the theoretical backing. Further research into the effects of Women in parliament over time would also be highly interesting, as it might give an indicator of gender equality's effect on societal policy, although controlling for other factors I imagine would be very difficult. Also, a close scrutiny of how and why FDI affects state environmentalism negatively would also shine some light on the current environmental debate.

Bibliography.

Almeida, T, A. & García-Sánchez. (2016) 'A Comparative Analysis Between Composite Indexes of Environmental Performance: An Analysis on the CIEP and EPI' in Environmental Science & Policy vol. 64: 59–74 (2016).

Arora-Jonsson S. (2011). 'Virtue and vulnerability: Discourses on women, gender and climate change' in 'Global Environmental Change 11' Found at: www.elsevier.com/locate/gloenvcha pp. 741-755
Arora-Jonsson, S. (2017) 'Gender and Environmental Policy' in MacGregor, S. (ed.) 'Routledge Handbook of Gender and Environment.' (2017) Routledge, New York, NY.

Bord, R, J. & O'Connor, R, E. (1997) The Gender Gap in Environmental Attitudes: The Case of Perceived Vulnerability to Risk. In Social Science Quarterly Vol. 78:4 (1997). University of Texas Press. Austin, Texas.

Bowie, F. (2000). 'Anthropology of Religion' Blackwell Publishers. Oxford. UK

Bryman, A. (2008). 'Social Research Methods, 3rd ed.' Oxford University Press. New York.

Buckingham, S. (2017) 'Gender and Climate Change Politics' in MacGregor, S. (ed.) 'Routledge Handbook of Gender and Environment.' (2017) Routledge, New York, NY.

Chalifour, N. J. (2017). 'How a Gendered Understanding of Climate Change can Help Shape Canadian Climate Policy.' in 'Climate Change and Gender in Rich Countries. Work, Public Policy and Action' by Griffin Cohen, M. Routledge, New York, NY. pp. 233-250

Daly, H, E. & Farley, J. (2010). 'Ecological Economics: Principles and Applications' (2nd ed.). Washington, DC: Island Press. ISBN 9781597266819.

Foster, J, B; Clark, B. & York, R. (2010) 'The Ecological Rift: Capitalism's War on the Earth' NYU Press. New York.

Gapminder.org (2018). www.gapminder.org (2019/01/09)

Grimes, P. & Kentor, J. (2003). 'Exporting the Greenhouse: Foreign Capital Penetration and CO2 Emissions 1980 1996.' Journal of World-Systems Research, 9(2), pp. 261-275.

Hultman, M. & Anshelm, J. 'Masculinities of Global Climate Change. Exploring ecomodern, industrial and ecological masculinity' in 'Climate Change and Gender in Rich Countries. Work, Public Policy and Action' by Griffin Cohen, M. Routledge, New York, NY. Chapter. 2

Jorgenson, K.A (2007) 'Does Foreign Investment Harm the Air We Breathe and the Water We Drink? A Cross-National Study of Carbon Dioxide Emissions and Organic Water Pollution in Less-Developed Countries, 1975 to 2000' Organization & Environment vol. 20. 2nd ed. pp. 137-156. Sage Publications. Doi: 10.1177/1086026607302153

MacGregor, S. (2010). 'A stranger silence still: the need for feminist social research on climate change.'The Editorial Board of the Sociological Review. Published by Wiley-Blackwell Publishing Ltd, Oxford, UK.

Marshall, M, N. (1996) 'Sampling for Qualitative Research.' Oxford University Press. Retrieved 2018/11/02 from: https://www.scribd.com/document/90452817/Qualitative-Sampling

Matthews, F. (1994). 'The Ecological Self'. Routledge. London, UK.

McAfee, K. (1998). 'Selling Nature to Save It? Biodiversity and Green Environmentalism' in Environment and Planning, Society and Space 1999, vol. 17. Pp. 133-154

Merchant, C. (1980) 'The Scientific Revolution and the Death of Nature' New York: Harper and Row.

Mies, M. & Shiva, V. (1993). Ecofeminism. London: Zed.

Norgaard, K. & York, R. (2005) 'Gender Equality and State Environmentalism' in Gender and Society, Vol. 19, No. 4. Pp. 506-522. Sage Publications, Inc.

O'Connor, J. (1998). 'Natural causes: Essays in ecological Marxism.' New York: Guilford.

Ritchie, H. & Roser, M. (2017). 'CO_2 and other Greenhouse Gas Emissions' https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions
Rowman and Littlefield Publishers, Inc. Oxford, Uk.

Schalk, M; Gunnarsson-Östling, U. & Bradley, K. (2017) 'Feminist Futures and 'Other Worlds', Ecologies of Critical Spatial Practice' in MacGregor, S. (ed.) 'Routledge Handbook of Gender and Environment.' (2017) Routledge, New York, NY.

Schnaiberg, A. & Gould, K, A. (1994).' Environment and society: The enduring conflict.' New York: St. Martin's.

Seager, J. (1993) 'Earth follies: Coming to Feminist Terms with the Global Environmental Crisis' New York: Routledge.

Tol. R.S.J. (2007). 'Europe's long-term climate target: A critical evaluation' in 'Energy Policy' vol. 35. Pp. 424-432. DOI: 10.1016/j.enpol.2005.12.003

Umweltbundesamt. 'Analysis of the Yale Environmental Performance Index (EPI)'. (2008) Retrieved, 2018/10/31
from: https://www.umweltbundesamt.de/sites/default/files/medien/publikation/long/3429.pdf

Unknown Author (2018). https://data.footprintnetwork.org/#/abouttheData

Unknown Author. (2018). 'The Polity Project'. Retrieved
from: https://www.systemicpeace.org/polityproject.html (2019/01/09)

Unknown Author. (2018). Greenhouse gas emission statistics - emission inventories. Retrieved from: https://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics_-_emission_inventories (2019/01/09)

Sellen, A. J & Harper, R. H. R (2002). 'The Myth of the Paperless Office'. MIT Press. Cambridge, Massachusetts. USA.

Stern, I. (2003). 'The Environmental Kuznets Curve'. Department of Economics, Rensselaer Polytechnic Institute, Troy, NY 12180, USA

Warren, K. (2000). 'Ecofeminist Philosophy: A Western Perspective on what it is and why it Matters'. Rowman & Littlefield Publ.

Wendling, Z. A., Emerson, J. W. Esty, D. C. Levy, M. A. de Sherbinin, A. *et al*. (2018). *2018 Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law & Policy. https://epi.yale.edu/

Xiao, C. & McCright, A, M. (2017) 'Gender Differences in Environmental Concern: Sociological Explanations' in MacGregor, S. (ed.) 'Routledge Handbook of Gender and Environment.' (2017) Routledge, New York, NY.

York, R; Rosa, E, A. & Dietz, T. (2003). 'Footprints on the earth: The environmental consequences of modernity.' American Sociological Review 68 (2): pp. 279-300.

York, R. (2006). 'Ecological Paradoxes: William Stanley Jevons and the Paperless Office' in Human Ecology Review, Vol. 13, No. 2. Pp. 143-147.