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ABSTRACT

The pressures of globalization, rising ecological footprint and shrinking biocapacity and concomitant global value change will contribute towards an increase of the importance of environmental issues in the Arab world in the coming years. Without question, already the time series data from available indices – like the KOF-Index of Globalization (2015) and Ecological Footprint Network data on ecological footprint and biocapicity - all point in the direction that in objective terms the Arab World will be confronted by a synchronous increase of these phenomena in the coming years. In addition, the newly available opinion data from the recently released *World Values Survey (6)* for twelve members of the Arab League (Algeria, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Palestinian Territories, Qatar, Tunisia, and Yemen), containing almost 70% of the population of the countries of the Arab League show to us that membership rate environmental organizations, participation in environmental demonstrations and giving priority to protecting the environment over economic growth are already a factor in those countries. Their weight will increase in the years to come, given the general and very robust underlying tendencies.

Our article analyzes the empirical relationship between rising globalization and ecological performance by establishing the global long-term, structural macro-quantitative determinants of environmental performance in the world system with cross-national data. In multiple standard OLS regression models, we test the effects of 26 standard predictor variables, including the ‘four freedoms’ of goods, capital, labor and services, whose weight will all increase in the Arab world in the coming years, on the following indicators of sustainable development

- avoiding net trade of ecological footprint gha per person
- Carbon emissions per million US dollars GDP
- CO2 per capita
- Yale/Columbia Environmental Performance Index (EPI)
- Global footprint per capita
- Happy Life Years
- Happy Planet Index

- ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)

Our research shows that the apprehensions of quantitative research, critical of neo-liberal globalization are fully vindicated by the significant negative environmental effects of the foreign savings rate. High foreign savings are indeed a driver of global footprint, and are a blockade against a satisfactory Happy Planet Index performance. The new international division of labor is one of the prime drivers of high CO2 per capita emissions. The penetration of economies by foreign direct investments by transnational corporations, which is the master variable of most quantitative dependency theories (MNC penetration), blocks environmental performance (EPI-Index) and several other socially important processes. Worker remittances have a significant positive effect on the Happy Planet Index, and Happy Life Years.

In attempting to draw some cautious predictions for the Arab World, the article then evaluates the performance of the Arab countries in this context with our cross-national data and with our analysis of *World Values Survey (6)* data for the region. While the documented data for the region from the Yale/Columbia EPI Index, which is the best single-shot available global environmental quality indicator today, and the Ecological Footprint Network time series data about rising ecological footprint and shrinking biocapacity in the Arab countries clearly indicate the sharply mounting and pressing environmental policy priorities in the region, the "greening" of Arab civil societies towards a higher degree of environmental consciousness and activism already is also becoming a considerable factor. The overall publics in Qatar and Libya are in the lead, while in the other Arab countries, environmental policy issues will gain considerably in importance in the public mindset as well. Decision makers would be well advised to channel already now these future environmental debates and movements to be expected in a way compatible with the overall well-being, prosperity, democratization and stability of the region.

Keywords: International Relations and International Political Economy; International Migration; Agricultural and Natural Resource Economics - General

JEL Classification Numbers: F5, F22, Q00

1. Introduction

The issues under empirical scrutiny here have an enormous importance for the future of policy-making on a global scale, and also for the decision makers in the Arab World. With the United Nations environmental conference Rio + 20 having ended in Rio de Janeiro, [1] the substantial issues remain on the table: what are the real drivers and bottlenecks of environmental performance, and what is the role of neo-liberal globalization in the process? And can there be any tendency towards an improvement in environmental trends as long as the global order is being based on neo-liberal globalization? Without question, the major world religions are already developing a high profile in global environmental questions. [2] The world religion of Islam, too, highlights the importance of the ecological agenda. [3] For a number of years now, also Western mainstream media talk about the "greening of Islam". [4]

Also for the European partner countries of what is now being called the *"Union for the Mediterranean",* the questions under scrutiny here have a special significance. The Arab/European partnership in the framework of the EU's Euro-Mediterranean strategy *(Union for the Mediterranean)* [5] is planned to promote economic integration and democratic reform across 16 neighbors to the EU's south in North Africa and the Middle East. Formerly known as the Barcelona Process, cooperation agreements were re-launched in 2008 as the Union for the Mediterranean (UfM). Projects address areas are now the economy, the environment, energy, health, migration and culture. Along with the current 28 EU member states, 15 Southern Mediterranean, African and Middle Eastern countries are members of the Union for the Mediterranean: Albania, Algeria, Bosnia and Herzegovina, Egypt, Israel, Jordan, Lebanon, Mauritania, Monaco, Montenegro, Morocco, Palestine, Syria (suspended), Tunisia and Turkey.

Let us recall here that this particular region of the world economy set out to make the EU to become a 'smart, sustainable and inclusive economy'. The EU-2020 strategy, which now substitutes the now defunct 'Lisbon agenda', which was the main policy strategy of the European Union from 2000 to 2010, [6] aims to make Europe a lot 'greener' by 2020. Europe must acquire, so the reasoning of Commission ex-President José Manuel Durao Barroso (*http://ec.europa.eu/commission_2010-2014/president/about/political/index_en.htm*), global leadership on climate change and developing new sources of sustainable growth and social cohesion. Europe should become a low emission economy, and should move in particular towards decarbonizing our electricity supply and the transport sector and should develop clean and electric cars. [7] Critics might say at this point that Europe better should mend its own, decaying common currency, the €, first, and that it is presumptuous to talk about the future until 2020, when entire countries, like Portugal, Ireland, Italy, Greece, and Spain (the so-called P-I-I-G-S) are on the verge of financial collapse. But let us look more into the

[1] http://www.uncsd2012.org/ (download: May 20, 2015) and http://www.unep.org/rio20/
[2] http://fore.yale.edu/www.ifees.org
[3] http://fore.yale.edu/religion/islam/
[4] http://blogs.vancouversun.com/2011/09/29/the-gradual-greening-of-islam/
[5] http://eeas.europa.eu/euromed/index_en.htm
[6] to make the EU "the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion", by 2010 (see: *http://www.europarl.europa.eu/summits/lis1_en.htm*)
[7] *http://ec.europa.eu/europe2020/index_en.htm*

details. EU-Commission ex-President Barroso underlined his unmistaken belief in globalization and 'world economic openness' as a driver of Europe's future strategy:

'Openness is critical to Europe's future competitiveness. This is not just a question of political preference. It is in our self-interest as the world's leading exporter.' (http://ec.europa.eu/commission_2010-2014/president/about/political/index_en.htm)

The question how to make Europe a lot 'greener' by 2020, how to acquire global leadership on climate change and developing new sources of sustainable growth and social cohesion, how to become a low emission economy, how to move in particular towards decarbonizing our electricity supply and the transport sector and how develop clean and electric cars has a universal message, not just a European one, and has implications especially also for the other highly-developed Western democracies, such as Australia, Canada, Israel, Japan, New Zealand and the United States of America.

In this quantitative research paper, we will first re-analyze the solid and accumulating macro-political and macro-sociological evidence on a global scale, published in the world's leading peer-reviewed social science journals, which all seems to indicate that there are indeed serious contradictions between unfettered globalization and unfettered world economic openness on the one hand and sustainable development for all the countries of the world system on the other hand.

For the first time, we evaluate the combined evidence about the effects of various manifestations of ultra-liberal globalization (and not just one process alone) on an entire variety of environmental indicators, such as the country performance measured by: avoiding net trade of ecological footprint gha per person; avoiding high carbon emissions per capita; avoiding high carbon emissions per million US dollars GDP; avoiding high ecological footprint (g ha /cap); a good Environmental Performance Index (EPI); a good performance on the Happy life years scale; a good performance on the Happy Planet Index, HPI; and avoiding becoming victim of natural disasters. We thus present a new empirical synthesis about peculiar tendencies, already studied by a number of researchers, most notably Jorgenson, 2003; 2004, 2005, 2006 in all detail, who suggested that there indeed seems to be a strong interaction between 'transnational capitalist penetration' and single measures of 'environmental degradation'. Notably enough, not one of these studies used the combined Yale/Columbia indices of the environmental situation, the 'Environmental Sustainability Index (ESI)' and the 'Environmental Performance Index (EPI)', available today for a very wide range of countries, and they relied instead on a startling variety of approximately eighteen single major environmental indicators, ranging from carbon dioxide emissions; deforestation; ecological footprint; emission of organic water pollutants; energy use; environmental protection efforts; fertilizer and pesticide consumption; greenhouse gas emissions; growth of ecological footprint; industrial organic water pollution, infant mortality; nitrogen oxides, volatile organic compounds, carbon monoxide and carbon dioxide gas; nitrous oxide emissions; organic water pollution; pesticide consumption; pesticide and fertilizer use; threatened mammal species; total carbon dioxide emissions and emissions per unit of production to water pollution, and infant mortality, often available for only a limited number of developing nations, and often excluding the experience of the countries of East and Central Europe and the former USSR, and other post-communist nations and the Arab World. But none of these studies looked at the effects of the entire variety of globalization processes on the entire variety of environmental indicators.

Precisely this is the aim of the present study. The rest of this study is organized as follows. In section 2, and due to limitations of space, we only very briefly sketch the main critical theories and earlier major studies on the subject. Section 3 presents the data and the research design. The main results are presented in Section 4, while Section 5 presents the environmental performance scales and environmental consciousness of the Arab World by global comparison, and Section 6 finally summarizes the study. The appendices should document our results and should be an invitation for the Arab research community to further use and test our explanations. [8]

2. Environmental development theory

Due to the usual limitations of space in international social science journals, our sketch of the relevant theories under scrutiny here is very brief indeed. In this survey, we concentrate on mainstream and "critical" theories in global social science, as evidenced in the leading global peer-reviewed journals. As it is too well known and even if one risks stating the obvious, the neo-classical/neo-liberal approach, culminating in the **Washington Consensus,** wants open markets and no barriers, and thinks that the private sector is much better equipped than the public sector, and intends to reduce public deficits (see Rodrik, 2006; Rodrik, Subramanian and Trebbi, 2004; Tausch/Ghymers, 2006). Indicators of 'economic freedom' will be dramatically and positively associated with economic, social and even environmental performance according to such a reading of realities (Gwartney, Lawson and Holcombe, 1999). Declining and restructured public sectors, deregulation and privatization, higher labor market flexibility, higher savings, international competition for locations of productions, international tax competition, price stability and budget consolidation will be the main drivers of efficiency, economic growth, investment, and a cleaner environment.

The omnipresent neo-liberal approach would stress that 'market methods' for pollution control are the best alternative available to the world. Economists should care about the determination of fee schedules, issues of spatial and temporal variation in fees or allowable emissions under permits, the life of permits and their treatment for tax purposes, rules governing the transfer of pollution rights, procedures for the monitoring and enforcement of emissions limitations, and so on. In the neo-liberal flagship article on environmental economics, Cropper and Oates welcome the *'growing receptiveness to incentive-based approaches to environmental management'* (Cropper and Oates, 1992: 728-731).

One very consistent counter-perspective to this neo-liberal **Washington Consensus,** and increasingly also ***'European Commission approach'*** is the **Kalecki/Steindl-paradigm** (see Guger/Marterbauer/Walterskirchen, 2004), based on the works of the political economists Michal Kalecki (June 22nd 1899 – April 17th 1970) and Josef Steindl (April 14th 1912 – March 7th 1993), emphasizing the factors of anti-cyclical policy (cycle and trend have the same determinants), demand, international cooperation, lower household savings, a rise of the public sector, a rising wage share, tax coordination, technology and educational policy as promoters of economic growth and employment (Kalecki, 1971; Steindl, 1952, 1990). The contrast with the contemporary neo-liberal agenda could not be starker:

Table 1: The counter-perspective of the Kalecki-Steindl-paradigm, compared to the

[8] For the debate in Europe, see: http://ec.europa.eu/europe2020/index_en.htm

current global neo-liberal agenda

Differences in growth strategies	
Steindl–Kaleckian growth policy	**Current mainstream on growth**
Full employment as main political concerns	Price stability and budget consolidation as main political concerns
Demand as growth driver	Supply as growth driver
Higher effective demand to raise employment	Higher labor market flexibility to raise economic growth
Technology and educational policy	Deregulation and privatization
Lower household savings	Higher savings (for investment)
Stable or rising wage share	Falling wage share (real unit labor costs)
Anti-cyclical policy (cycle and trend have the same determinants)	No active anti-cyclical policy (irrelevant for growth path)
Rise of public sector promotes growth (through effective demand)	Decline and restructuring of the public sector (efficiency)
Tax coordination	International tax competition
International cooperation	International competition (location)

Source: Guger/Marterbauer/Walterskirchen, 2004

Dependency and world systems theories, which start from a similar general outlook as the Kalecki/Steindl paradigm, in turn culminate in predicting, with Cardoso, [9]1979 the following processes to happen:

- There is a financial and technological penetration by the developed capitalist centers of the countries of the periphery and semi-periphery,
- This produces an unbalanced economic structure both within the peripheral societies and between them and the centers,
- This leads to limitations on self-sustained growth in the periphery,
- This favors the appearance of specific patterns of class relations, and
- These require modifications in the role of the state to guarantee both the functioning of the economy and the political articulation of a society, which contains, within itself, foci of inarticulateness and structural imbalance (Cardoso, 1979).

For these approaches, low comparative price levels, high foreign savings, the openings of the national economies to free production zones, a low MNC outward investment presence on the world markets (MNC headquarter status) and a high MNC PEN - stock of Inward FDI per GDP, as well as a high world economic openness, measured by the export-share per GDP + import-share per GDP, all could constitute possible negative (sustainable) development bottlenecks.

[9] Fernando Henrique Cardoso, the social scientist and former President of Brazil, is an especially important name to mention here for Arab audiences; see the website of his Think-Tank Instituto Fernando Henrique Cardoso at http://www.ifhc.org.br/ (currently best available in Portuguese). Cardoso the social scientist and Cardoso the President combined a sharp awareness of the problems of dependency in the periphery countries of the world with a clear commitment to initiate measures to save the Amazon region of Brazil from extinction.

The relatively coherent tendency of these studies suggests that there seems to be a strong interaction between transnational capitalist penetration and environmental degradation, especially in third world countries. [10] To date, the most important neo-liberal counter-study to this fledging scientific tradition was the essay by Ehrhardt-Martinez, Crenshaw, and Jenkins, 2002, which analyzed deforestation rates, 1980-1995 in the developing countries.

In this article, we will duly take into account several indicators of globalization and dependency, which are being measured by the following different variables of '(in)/dependent development' (for a more through debate on globalization and inequality, see also: Herkenrath and Bornschier, 2003; Herkenrath, Koenig, Scholtz, and Volken, 2005; Heshmati and Tausch, 2007; Tausch and Heshmati, 2011):

- **MNC penetration** (MNC PEN) measures the different degrees of weight that foreign capital investments have in the host countries, i.e. the UNCTAD percentages of the stocks of multinational corporation investments per total host country GDP. This research tradition has been especially developed, as we already mentioned, by the Swiss sociologist Volker Bornschier and his school. Bornschier and his school predicted a strong negative determination of development by a high MNC penetration, due to the negative consequences, monopolies have on the long term development trajectory of countries

- We also ascertain the **growth of MNC penetration over time (DYN MNC PEN)**, from 1995 to 2005. The Bornschier school expected short-term dynamic effects from such MNC penetration increases

- Equally, Bornschier and his school already developed a high theoretical and empirical awareness about the long-term consequences of the presence or absence of **'MNC headquarter status' (MNC HEADQU),** measured in our analysis by the indicator MNC outward investments (stock) per GDP. Bornschier and his school expected that a high headquarter status mitigates against the long-term negative effects of MNC penetration

- **FPZ (free production zones)** employment as % of total population is the indicator, best suited to measure the new international division of labor (NIDL). Froebel/Heinrichs and Kreye, 1980 already predicted the unfettered rise of this model ('export processing zones'), especially in China and Southeast Asia. Froebel/Heinrichs/Kreye, 1980 was followed, among others, by the studies Rondinelli, 1987; Ross, 2004; and Singa-Boyenge, 2007. Export Processing Zones (EPZ) – or ***'Free Production Zones'*** already account for some 80 percent of the merchandise exports of countries like China, Kenya, the Philippines, Malaysia, Mauritius, Mexico, Senegal, Tunisia, Vietnam. 3500 EPZs in 130 countries of the world now employ 66 Million people, among these 40 million employees in China.

- **'low comparative price levels'** or 'unequal exchange/unequal transfer' (Kohler/Tausch, 2001) is operationalized here simply by ERD or ERDI, the exchange

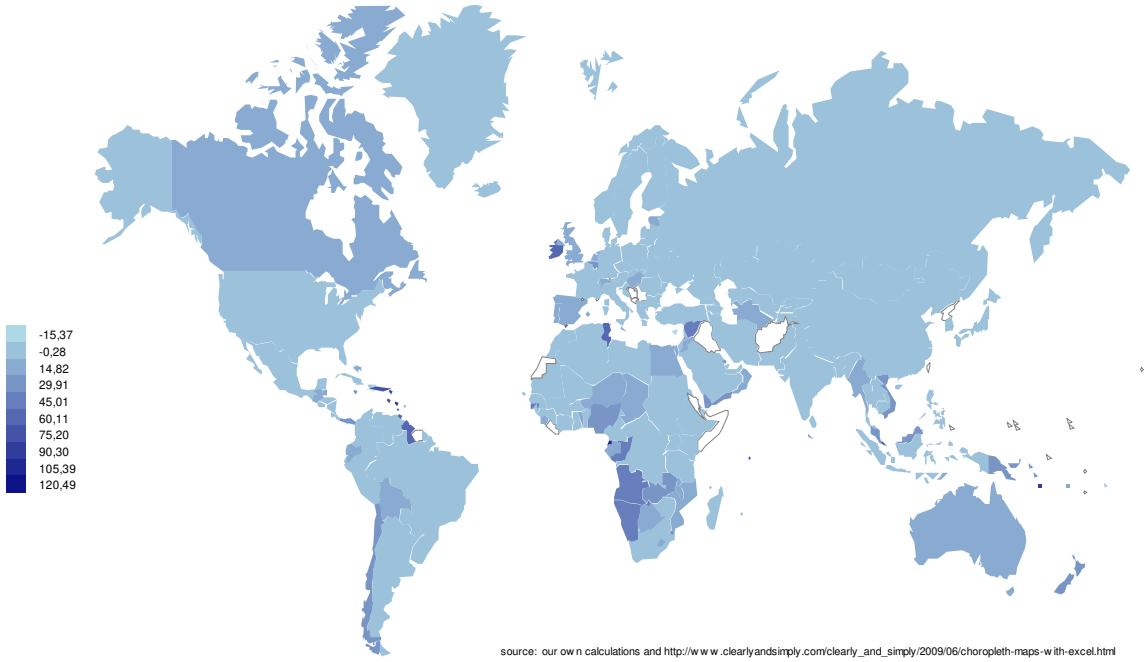
[10] most notably Jorgenson, 2003; 2004a, 2004b; 2005; 2006a, 2006b; 2007a, 2007b; 2008; 2009a, 2009b; 2009c, 2009d; Jorgenson, and Burns, 2004, 2007; Jorgenson and Clark, 2009; Jorgenson and Kuykendall, 2008; Jorgenson, Austin and Dick, 2009; Jorgenson, Dick and Mahutga, 2007.

rate deviation index, which measures the degree, to which globalization has contributed to lowering the international price level of a country; i.e. it is an indicator about the openness of the price system *vis-à-vis* the pressures of dependent insertion into the global economy. Ever since Balassa, 1964 and Samuelson, 1964, economists have linked the comparative price level to the price relationship between tradables and non-tradables. Neoliberals assume that globalization will lead towards a lowering of comparative price levels around the globe. ERD is calculated by the ratio between GDP at purchasing power parities, divided by GDP at current exchange rates (Kohler/Tausch, 2001).

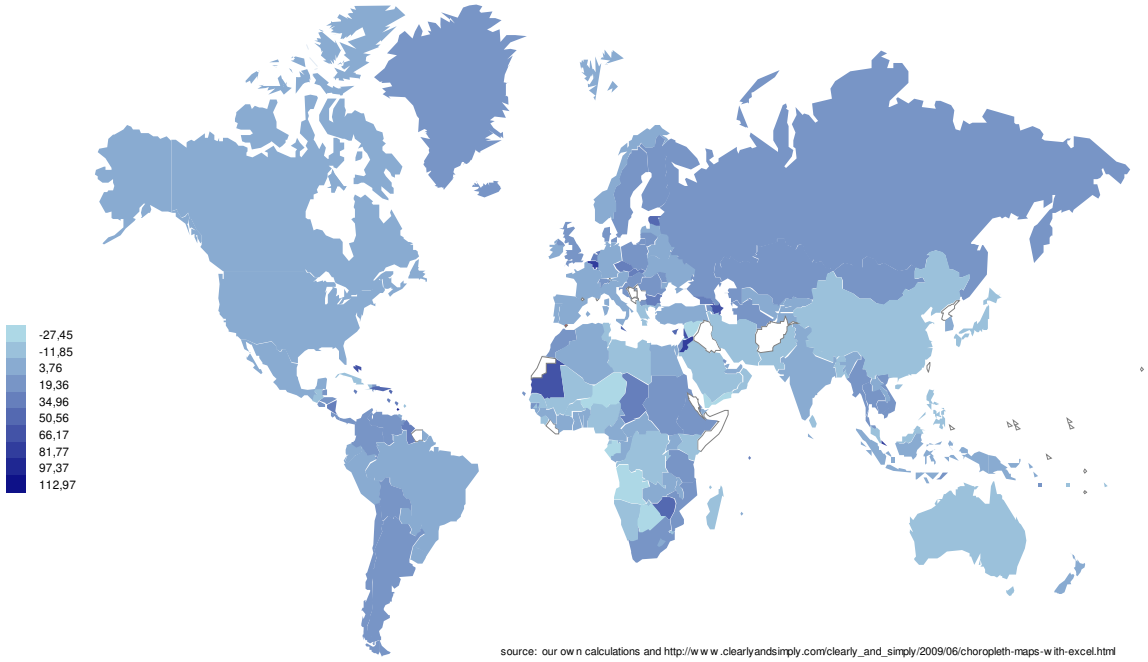
- For dependency authors, **foreign savings** show the weight that foreign savings, mostly from the centers and richer semi-peripheries, have in the accumulation process of the host countries in the periphery and semi-periphery. It is calculated by the difference between the share of investments per GDP and the share of savings per GDP.

Choropleth Map 1 – to Map 6 all summarize the available evidence about these variables on a global scale. The data and their definitions and sources are freely available from http://www.social-sciences-and-humanities.com/journal/?p=3402 and http://www.social-sciences-and-humanities.com/journal/?p=2017.

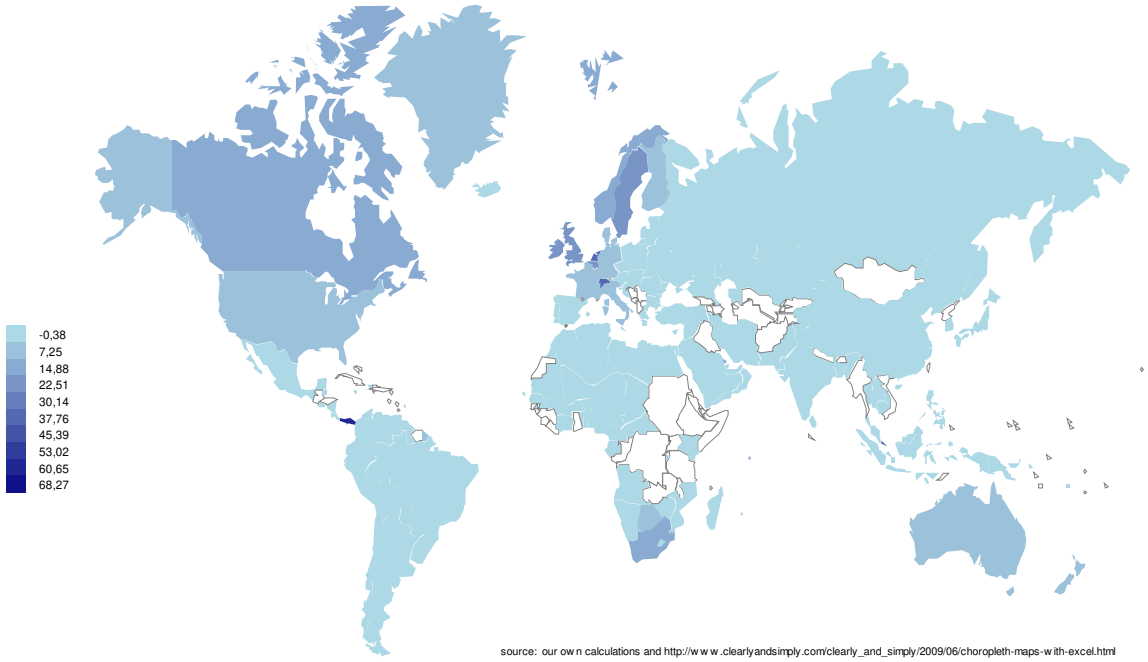
Choropleth Map 1: MNC penetration



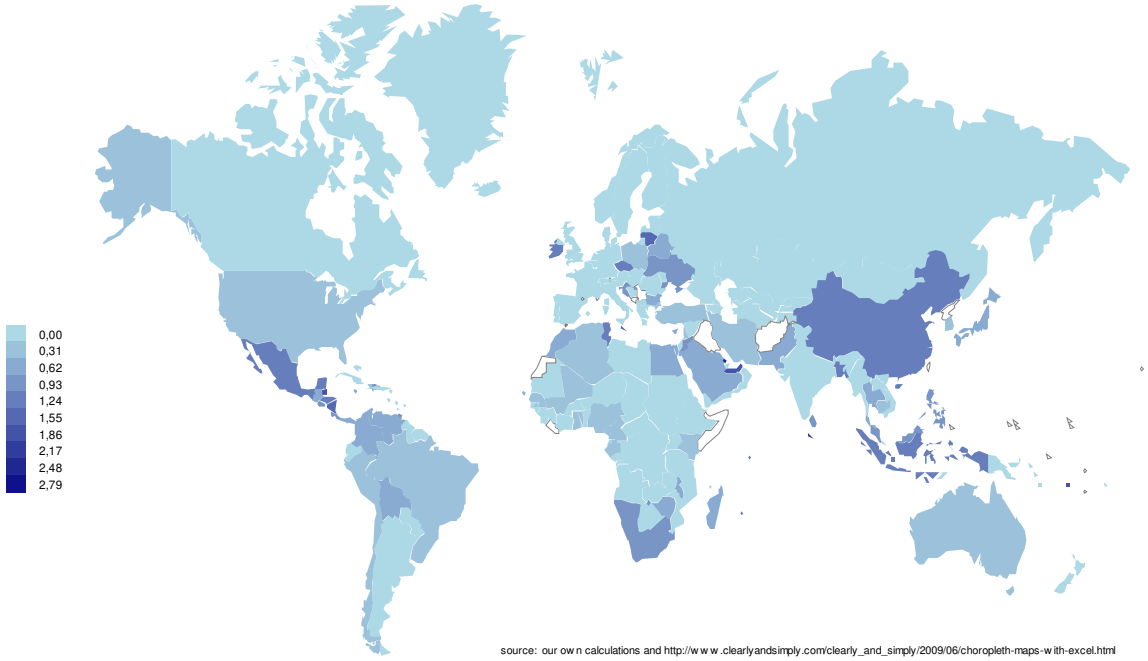
Choropleth Map 2: Increase of MNC penetration over time - DYN MNC PEN



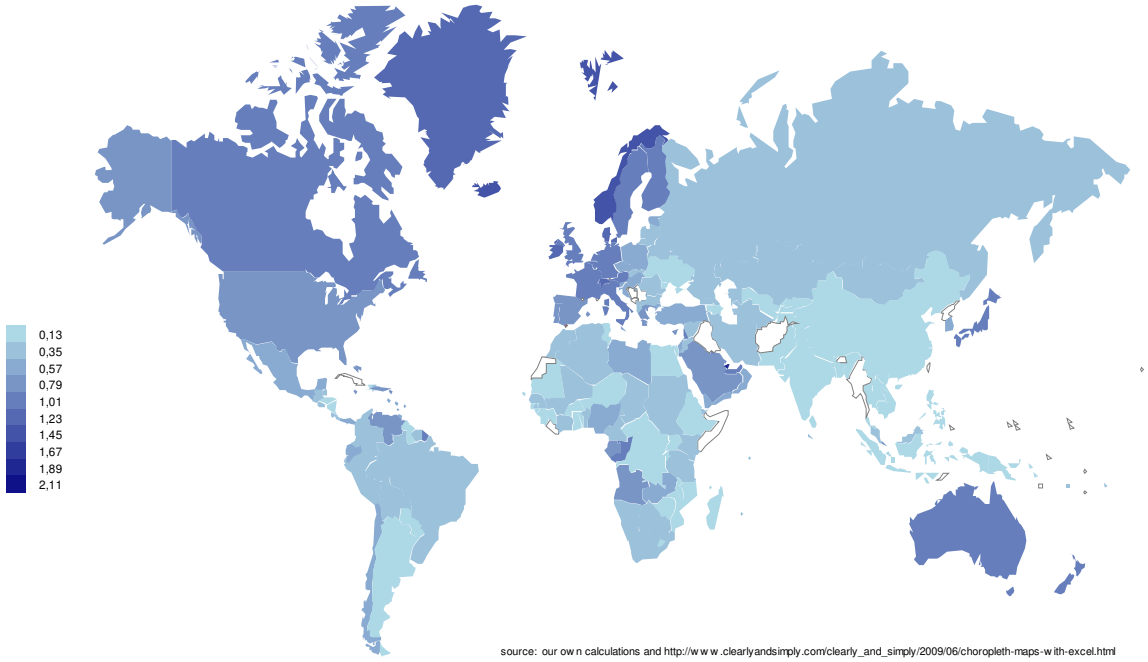
Choropleth Map 3: MNC headquarter status' (MNC HEADQU)



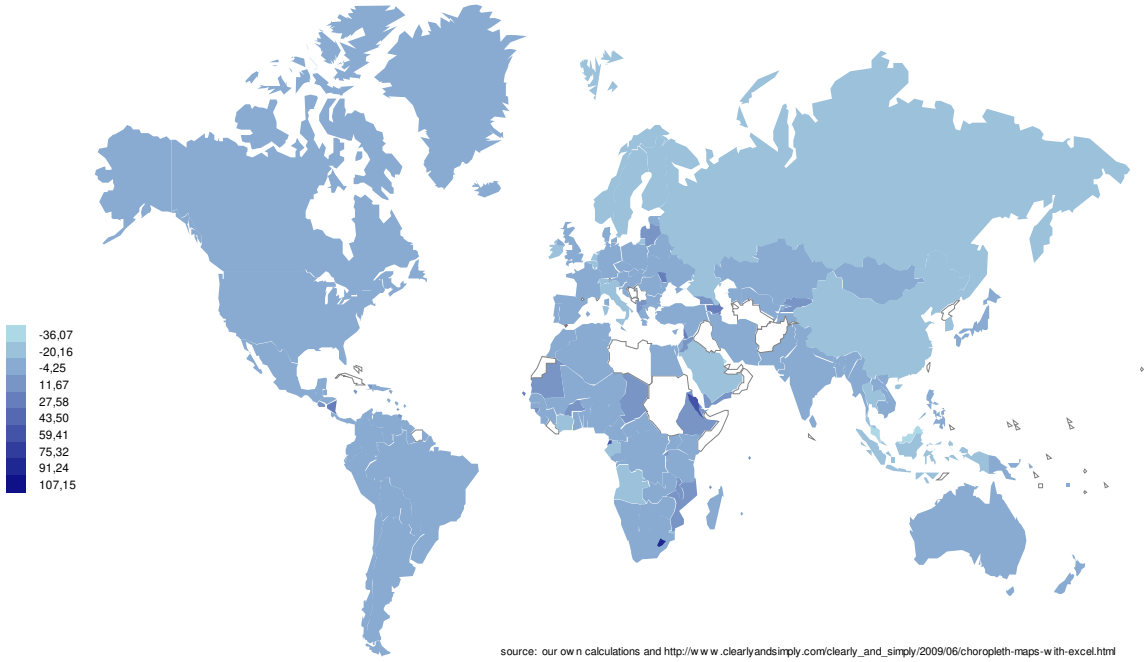
Choropleth Map 4: FPZ (free production zones) employment as % of total population (fourth root)



Choropleth Map 5: low comparative price levels



Choropleth Map 6: foreign savings



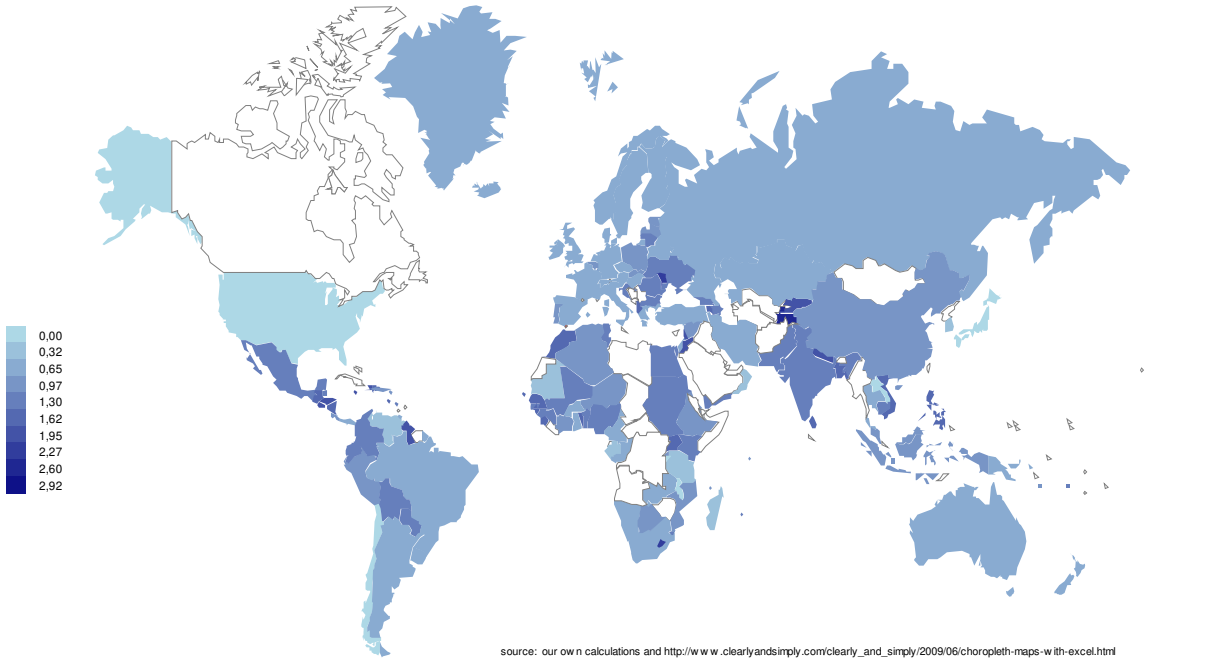
These three theoretical positions – the neo-liberal approach, the 'neo-Keynesian' Kalecki/Steindl-paradigm, and the dependency/world systems research, inspired a great number of empirical studies not only on economic growth, but also on sustainable development.

The cross-national analysis of the effects of **migration** patterns on the development of the countries of the world system is only of a more recent date (Hatton and Williamson, 2009;

Sanderson, 2010). Considering the enormous quantity of migration-related human transport and its environmental impacts around the globe, to our knowledge, there is as yet not a single essay available on the relationship between the freedom of movement and the environment. The divisive issue of migration policy divides opinions around the globe, and it also divides opinions among the global social science research community. In dealing with the issue of migration, we first might notice that there is hardly any solid cross-national evidence available about the macro-societal effects of migration on national development.

Most liberal and left of the center-oriented global political discourse would expect that **worker remittances** have very general, beneficial general and also environmental effects for the sending countries, and that they amount to a very huge transfer machine of wealth from the rich, migration recipient countries to the poor, migration sending countries (Ziesemer, 2009). **Migration is thus seen as a win-win situation** (Taylor, 1999, 2006; UNDP HDR, 2009). UNDP HDR 2009 maintains that financial remittances are vital in improving the livelihoods of millions of people in developing countries. There is a positive contribution of international remittances to household welfare, nutrition, food, health and living conditions in places of origin. Even those whose movement was driven by conflict can be net remitters, as illustrated in history in Bosnia and Herzegovina, Guinea- Bissau, Nicaragua, Tajikistan and Uganda, where remittances helped entire war-affected communities to survive. In some international migration corridors, money transfer costs have tended to fall over time, with obvious benefits for those sending and receiving remittances. An important function of remittances is to diversify sources of income and to cushion families against setbacks such as illness or larger shocks caused by economic downturns, political conflicts or climatic vagaries (UNDP HDR, 2009: 72).

Choropleth Map 7: worker remittances as % of GDP (fourth root)



Similarly, the UNDP also maintains that there should be significant aggregate gains from movement, both to movers and to destination countries. The destination countries will capture about one-fifth of the gains from a 5 percent increase in the number of migrants in developed countries, amounting to US$190 billion dollars. Immigration increases employment, with no evidence of crowding out of locals, and investment also responds vigorously to immigration.

Population growth due to migration increases real GDP per capita in the short run, one-for-one (meaning that a 1 percent increase in population due to migration increases GDP by 1 percent). However, not all of the optimistic forecasts of the liberal migration policy school of thought can be maintained on a 1:1 basis. It cannot be excluded out of hand that inward migration increases – *ceteris paribus* – the environmental strain variables in the migration recipient countries due to the direct, mostly transport related effects a society based on large-scale immigration implies, but also because of the priorities in favor of economic growth and not the environment, which are observable in the majority of the migration sending countries in international value surveys (protecting environment vs. economic growth – data from the latest wave of the *World Values Survey*, 2004-2007; *World Values Survey*, September 20th 2010, online data analysis from *http://www.wvsevsdb.com/wvs/WVSAnalize.jsp*).

3. Developing the research design

The data and their definitions and sources are freely available from http://www.social-sciences-and-humanities.com/journal/?p=3402 and http://www.social-sciences-and-humanities.com/journal/?p=2017. Our investigation duly acknowledges many of the key determinants of economic growth, mentioned in the economic literature (see also de Haan, Lundstrom and Sturm, 2006; Dollar, 1992a, 1992b; Hamid, 2007; Laver and Shepsle, 1999; Levine and Renelt, 1992; Sala-i-Martin, 2007; Sala-i-Martin, Doppelhofer and Miller, 2004; Tausch/Heshmati, 2011), like current shares of the country's inhabitants in total world population, calculated from UNDP data; the famous Heritage Foundation 2000 Economic Freedom Score; absolute geographical latitude, adapted from Easterly's growth theory; the UNDP figures for long-term annual population growth rate, 1975-2005 (%); the trade-off between development level and development performance, otherwise also known in economics as 'conditional convergence' (ln GDP per capita; ln GDP per capita ^2); the simple Huntingtonian fact of whether a country is Muslim country, to be measured by the Organization of Islamic Conference (now Organization of Islamic Cooperation) (OIC) Membership or by Muslim population share (Nationmaster); UNDP data on the simple geographical fact of population density (based on the CIA's World Factbook); UNDP data on public education expenditure per GDP; and the UNDP education index, combining the enrolment rates at the primary, secondary and tertiary education level. We also take into account UNDP figures on military expenditures per GDP and the openly available CIA data on military personnel rate, which are key variables of contemporary political science international relations theory and peace research. In our analysis, we also show the theoretical and practical (political) potential of the following drivers of development, which are somewhat a *'terra incognita Australis'* in the hitherto existing macro-sociological debate, like migration and European (Monetary) Union membership[11].

The choice of a country to be included in the final analysis (175 countries) was determined by the availability of fairly good data series for these independent variables (if not mentioned otherwise, UNDP data for the middle of the first decade of the new millenium, contained in the dataset Tausch, 2011). In the final regressions, we applied the 'listwise delition of missing values' routine. The statistical design of our study is thus based on the usual, SPSS-XXII ordinary least square standard regression (SPSS, 2007) of the **'kitchen sink type'** (Durlauf *et al.,* 2008; Laver and Shepsle, 1999) of economic growth and economic, social and political

[11] For an extensive list on the usage of these control variables in recent literature, see Tausch and Heshmati, 2011: 34-36.

performance in the research tradition of Barro, 2003. Prior stepwise regression procedures selected the significant among the total list of 26 available predictors. Surveying the vast econometric literature on the subject of the possible drivers and bottlenecks of development of a given country, one also finds support for the inclusion of geographic and demographic variables in the comparative analysis of development success or failure (Barro and Sala-i-Martin, 2003, Barro 1991, 1996, 1998).

4. The main results: beyond the pro-globalist environment approach

We will now briefly present the results of our standard OLS multiple regression analyses. In our view, the regression results, presented in the Appendix 3 of this work, present the best available choice of variables from both the theoretical as well as statistical perspective. In testing the implications of the competing paradigms, we arrive at the following list of multiple regressions with very significant statistical results:

Table 2: the final results from multiple regression analysis: The properties of the statistical investigations

	adj R^2	**df**	**F**	**error probability of the entire equation**
Global footprint	81.200	135	117.592	.000
Environmental Performance Index (EPI)	78.900	140	88.259	.000
Happy Life Years	77.100	102	86.653	.000
CO2 per capita	72.700	159	71.594	.000
avoiding net trade of ecological footprint gha per person	40.900	138	20.111	.000
Happy Planet Index	38.000	119	19.217	.000
Carbon emissions per million US dollars GDP	35.000	144	16.535	.000
ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)	14.400	159	7.713	.000

So let us now see the results in detail. First we concentrate on the effects of the variables, measuring the four economic freedoms of trade, capital, services and labor. Our first analysis deals with the impact of **world economic openness** on the main indicators of the environment. It emerges that the impact of liberal policies on the quality of environmental policy is not necessarily and generally negative. In the world system, some of the most persistent sinners in terms of CO2 and SO2 output, poisoning lands, rivers and woodland were the Communist dictatorships, which ruled East-Central Europe until 1989/90. Thus it is no surprise that world economic openness does not increase, but decreases – *ceteris paribus* – CO2 emissions per capita.

The significant influence of **comparative price levels,** measuring the level of services, on our

chosen indicators is equally clear. Neo-liberal theories start from the assumption that low comparative price levels will be an advantage for the development process, and high comparative price levels will impede the development trajectory. Our empirical results confirm the fact that a liberal framework does not **necessarily** impede a good ecological performance. It can be shown that high comparative price levels indeed lead necessarily towards a higher involvement in the net trade of ecological footprint gha per person.

Now let us measure the effects of the freedom of capital. The main thrust of the serious apprehensions of research, critical of neo-liberal globalization is fully vindicated by the significant effects of the **foreign savings rate**. High foreign savings are indeed a driver of global footprint, and are a blockade against a satisfactory Happy Planet Index performance.

The New International Division of Labor (NIDL)-model, based on free production zones or export processing zones, featured in the critical theories of globalization since the 1970s, most prominently in the works of Froebel, Heinrichs, and Kreye, and which best can be measured by the indicator **free production zones employment as % of total population**, is one of the prime drivers of high CO2 per capita emissions.

MNC penetration, the master variable of most quantitative dependency theories, blocks environmental performance (EPI-Index) and several other socially important processes

MNC PEN - stock of Inward FDI per GDP	quintile share income difference between richest and poorest 20%	0.221	0.013
	Infant mortality 2005	0.160	0.000
	democracy measure	-0.147	0.011
	Environmental Performance Index (EPI)	-0.113	0.005
	rule of law	-0.090	0.168

Now let us measure the effects of the freedom of labor. **Worker remittances** have a significant effect on the environment. They have a positive effect on the Happy Planet Index, and Happy Life Years. We can assume that the export of labor to the world economy indeed has beneficial effects on life quality (Happy Planet Index, Happy Life Years). We can also assume that the **import of labor** to the world economy has – *ceteris paribus* - **detrimental effects on life quality (Happy Planet Index, Happy Life Years).**

The consensus of a large and ever-growing tradition of research would tend to see the effects of international migration on the recipient countries in very positive terms, the political noise from migra-phobic politicians to the contrary. **However, not all of the optimistic forecasts of this liberal school of thought can be maintained empirically or at least on a 1:1 basis. Why should the globalization of three freedoms - capital, goods and services - be so socially and environmentally destructive in its consequences – as the critical public in Western countries thinks, while freedom number four – labor – should have only positive effects, fully described by neo-liberal economics?** Why should one be a globalization critic in the case of the freedom of trade, capital and services, and be neo-liberal at the same time concerning the effects of freedom number four, labor? We already hinted above at the fact that we can assume from the effects of worker remittances that the **import** of labor to the world economy has – *ceteris paribus* - **detrimental** effects on life quality (Happy Planet Index, Happy Life Years).

Also, the percentage of the population with what today is called an ***'immigration background'*** has – *ceteris paribus* – a **negative** effect on some other key indicators of the environment. **Immigration, and all the transport activities it causes**, increases without question the **CO2 output of a given society**, and it also increases the ratio of **carbon emissions per GDP**.

But there are not only clear-cut detrimental effects. Also, there are positive ones. Interestingly enough, a large share of people with migration background per total population also is significantly associated with a **lower** number of people per million inhabitants 1980-2000 killed by natural disasters per year, but this ratio might also reflect **past migration patterns** from disaster prone regions to safer places with less disasters over the earlier decades, reflected in higher ratios of people with migration background per total population decades later.

Now let us analyze the effects of the other, controlling variables. In accordance with neo-liberal approaches, and in discord with the mainstream of globalization-critical research, **Economic Freedom as such has** a significant positive impact on indicators of the environment. The environmental variable, affected by economic freedom in a good direction, is carbon emissions per GDP.

The **UNDP education index** as the chosen predictor for the long-standing UNDP **human capital propelled development approach** has the predicted significant and beneficial effects on

Environmental Performance Index (EPI)
ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1) (reduction of disaster risk)

The significant effects of **military expenditures per GDP** on the environment are rather limited in comparison to the other drivers and bottlenecks of international development, under investigation here. They significantly diminish the number of Happy Life Years, indicating a *ceteris paribus* negative trade-off **not** with life expectancy, but with **life quality as such**, as measured by the Happy Life Years Indicator. The burden of the military effort thus has a limited negative effect on life quality.

Our research results suggest that – *ceteris paribus* – **high military personnel rates are** a bottleneck of the environmental performance, as measured by the Yale/Columbia EPI Index.

The best single measure on the control, which women exercise over the structures of national government, arguably is the indicator **'% women in government, all levels',** which goes much beyond the ministerial level and looks at different layers of government, i.e. the top political and administrative sphere, where the real decisions on the day-to-day running of a given country are being taken. It is the globally leading indicator of established feminist power. However, there is also a darker side to the whole story, although the effects are only significant at the 7.4% and the 5.2% level. *Ceteris paribus* it holds that structures, where *'real existing feminism'* plays an important role, are tending towards a higher involvement in the international trade of ecological footprint, the most visible sign of globalization, affecting the environment either as net exporters or net importers of ecological footprint. The result indicate that real existing, established feminist power – under the conditions of 'real existing globalization' has not come to terms positively with all the environmental indicators under scrutiny here.

Our empirical investigations also show that **European Union** and or **European Monetary Union membership** have rather small beneficial effects. There are only two significant positive effects to be reported in this context, and both concern a comparable dimension of environmental policy. The member countries of the European Monetary Union are good at reducing ecological footprint. Likewise, years of EU-membership coincide with avoiding net trade of ecological footprint.

We will now look closer at the significant effects of the geographical, demographical and historical determinants of development performance, which cannot be influenced by short-term or, in many cases, even long-term actions of governments, and which have to be interpreted as 'givens', which a country faces today.

Let us start with the effects of **absolute latitude,** a variable, which often appears in the econometrical literature on drivers and bottlenecks of development performance, but which is outside the domain of interest of the mainstream of empirical dependency and world-systems research. Predictably, and due to climatic reasons, latitude has a very strong and significant effect on carbon emissions per million US dollars GDP, and has a considerable negative effect on life satisfaction.

Population density seems to affect the ecological costs of infrastructure, and significantly reduces CO2 emissions per capita and global footprint.

The **percentage share of a given country in current world population** today, and hence, population size, has an independent and *ceteris paribus* negative development effect on the EPI Environmental Performance Index.

Our empirical results also suggest a new perspective on the curve-linear relationships between development level and environmental development performance. Let us clearly distinguish here between the old *'Kuznets hypothesis'* of first deteriorating, and then improving income inequalities, and the *'Matthews effect'* of rising, and then shrinking (economic) growth rates. In our research, we could establish that, after taking care of the direction of the indicators, there is a wide array of first **improving and then deteriorating environmental performances.** They all concern the environment and the health/basic human needs dimensions:

avoiding CO2 per capita
avoiding global footprint
avoiding net trade of ecological footprint gha per person
Environmental Performance Index (EPI)
Happy Planet Index

The **pessimistic essence of the Kuznets curve** with rapidly increasing societal problems and very deficient development performances at middle stages of development holds for the following phenomena of the ecological efficiency of the economy, and avoiding disaster risk. All these effects suggest that *'things get worse before they get better':*

avoiding carbon emissions per million US dollars GDP
avoiding ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)

The following variables wield no significant effects: for the globalization critical paradigm of Volker Bornschier, an important control variable was **MNC headquarter status**. But it has no significant effect on any of our environmental variables. **Increases in MNC penetration over time** had no significant effect on the environment. **Net international migration rates**, 2005-2010, which is a typical migration flow measure, do **not** affect significantly any of our environment development indicators. Also, the *ceteris paribus* effects of membership in the **Islamic Conference** and **Muslim population shares** cannot be reduced to a simplistic reasoning. They do not affect any of our chosen environmental indicators in a significant way. Also, the share of **public education expenditures per GDP** has no significant effects on any of our environmental indicators. **Annual population growth** also has no significant effect on any of the environmental development indicators.

5. Implications for the Arab countries

Globalization increased rapidly the world over and also in the twenty-two Arab countries throughout much of the 1970s, 1980s, and beyond right to the onset of the global economic crisis in 2008, when we observe a certain anti-globalization backlash. This robust overall tendency is documented in the time series graph of Appendix 1 of this article for the nineteen Arab countries and the Palestinian Territories with available data from the ETH Zurich KOF Globalization Index data archive. [12]

Appendix 2 documents for sixteen members of the Arab League the relevant Global Footprint Network data on environmental strains from 1961 onwards. [13] Almost the entire Arab World – with the exception of Mauretania and Somalia - seems now to be running ecological deficits, with Footprints larger than their own biological capacity. The Global Footprint Network is correct in emphasizing that the implications of ecological deficits can be devastating, leading to resource loss, ecosystem collapse, debt, poverty, famine and war.

The pressures of globalization (Appendix 1), rising ecological footprint and shrinking biocapacity (Appendix 2) and concomitant global value change (Appendix 4) will contribute towards an increase of the importance of environmental issues in the Arab world in the coming years. Without question, already the time series data from available indices – like the KOF-Index of Globalization (2015) and Ecological Footprint Network data on ecological footprint and biocapicity - all point in the direction that in objective terms the Arab World will be confronted by a synchronous increase of these phenomena in the coming years. In addition, the newly available opinion data from the recently released *World Values Survey (6)* for twelve members of the Arab League (Algeria, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Palestinian Territories, Qatar, Tunisia, and Yemen), containing almost 70% of the population of the countries of the Arab League show to us that membership rate environmental organizations, participation in environmental demonstrations and giving priority to protecting the environment over economic growth are already a factor in those countries. Their weight will increase in the years to come, given the general and very robust underlying tendencies.

Appendix 4 makes available these new opinion data on environmental activism and environmental consciousness in the Arab World. Given that the tendencies of globalization

[12] http://globalization.kof.ethz.ch/
[13] http://www.footprintnetwork.org/en/index.php/GFN/

are omnipresent, that the ecological situation in much of the region is precarious and that environmental consciousness and also protest movements are on the rise, we cannot but speak about an inescapable tendency towards the “greening of Arab politics”.

The most comprehensive state of the global environment index in the countries of the world is the Yale/Columbia University Environmental Performance Index. [14] It measures the performance of 178 countries on 20 indicators reflecting national-level environmental data. These indicators are combined into nine issue categories, each of which fit under one of two overarching objectives: Environmental Health and Ecosystem Vitality.

Environmental Health measures the protection of human health from environmental harm. Ecosystem Vitality measures ecosystem protection and resource management.

These two objectives are further divided into nine issue categories that span high-priority environmental policy issues, including air quality, forests, fisheries, and climate and energy, among others. The twenty key indicators are:

1) Probability of dying between a child's first and fifth birthdays (between age 1 and 5)
2) Percentage of the population using solid fuels as primary cooking fuel.
3) Population weighted exposure to PM2.5 (three- year average).
4) Proportion of the population whose exposure is above WHO thresholds (10, 15, 25, 35 micrograms/m3).
5) Percentage of population with access to improved drinking water source.
6) Percentage of population with access to improved sanitation.
7) Wastewater treatment level weighted by connection to wastewater treatment rate.
8) Subsidies are expressed in price of their product in the domestic market (plus any direct output subsidy) less its price at the border, expressed as a percentage of the border price (adjusting for transport costs and quality differences).
9) Scoring of whether countries have signed on to the Stockholm Convention and allow, restrict, or ban the "dirty dozen" POPs that are common agricultural pesticides.
10) Forest loss - Forest gain in > 50% tree cover, as compared to 2000 levels.
11) Catch in metric tons from trawling and dredging gears (mostly bottom trawls) divided by EEZ area.
12) Percentage of fishing stocks overexploited and collapsed from EEZ.
13) Percentage of terrestrial biome area that is protected, weighted by domestic biome area.
14) Percentage of terrestrial biome area that is protected, weighted by global biome area.
15) Marine protected areas as a percent of EEZ.
16) Percent of critical habitat sites as designed by the Alliance for Zero Extinction protected.
17) Change in CO2 emissions per unit GDP from 1990 to 2010.
18) Change in Trend of CO2 emissions per unit GDP from 1990 to 2000; 2000 to 2010.
19) Change in CO2 emissions from electricity and heat production.
20) Percent of population with access to electricity.

Table 3 and Choropleth Map 8 list the performance of the countries of the world and the Arab countries in particular on the Yale/Columbia EPI indicator. While Kuwait, Qatar, Saudi Arabia, and United Arab Emirates belong to the top 25% of the countries of world society according to the EPI Index, Comoros, Djibouti, Iraq, Mauritania, Somalia, Sudan, and Yemen

[14] http://epi.yale.edu/

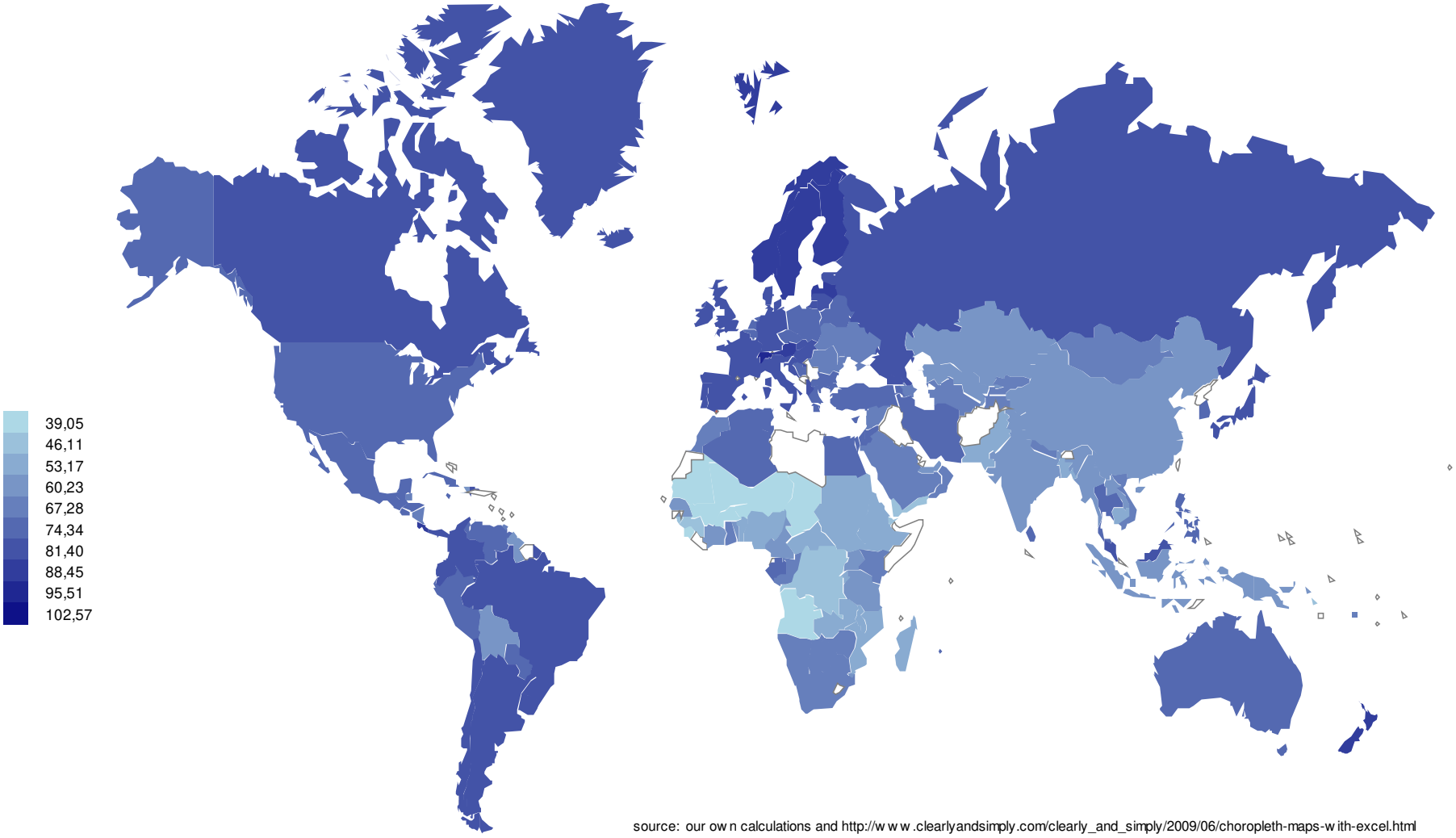
belong to the bottom 25% performers in world society and must be categorized as the ecological problem areas of the Arab world in the years to come.

By contrast, Table 4 and Appendix 4 show to us that consciousness and activism in environmental areas is most developed in the relatively richer countries of Qatar and Libya, while in the other Arab countries with available *World Values Survey* data, environmental activism as yet did not materialize in a way as suggested by the data on the already existing objective environmental conditions.

Table 3: Environmental Performance Index (Yale Columbia) in the Arab World

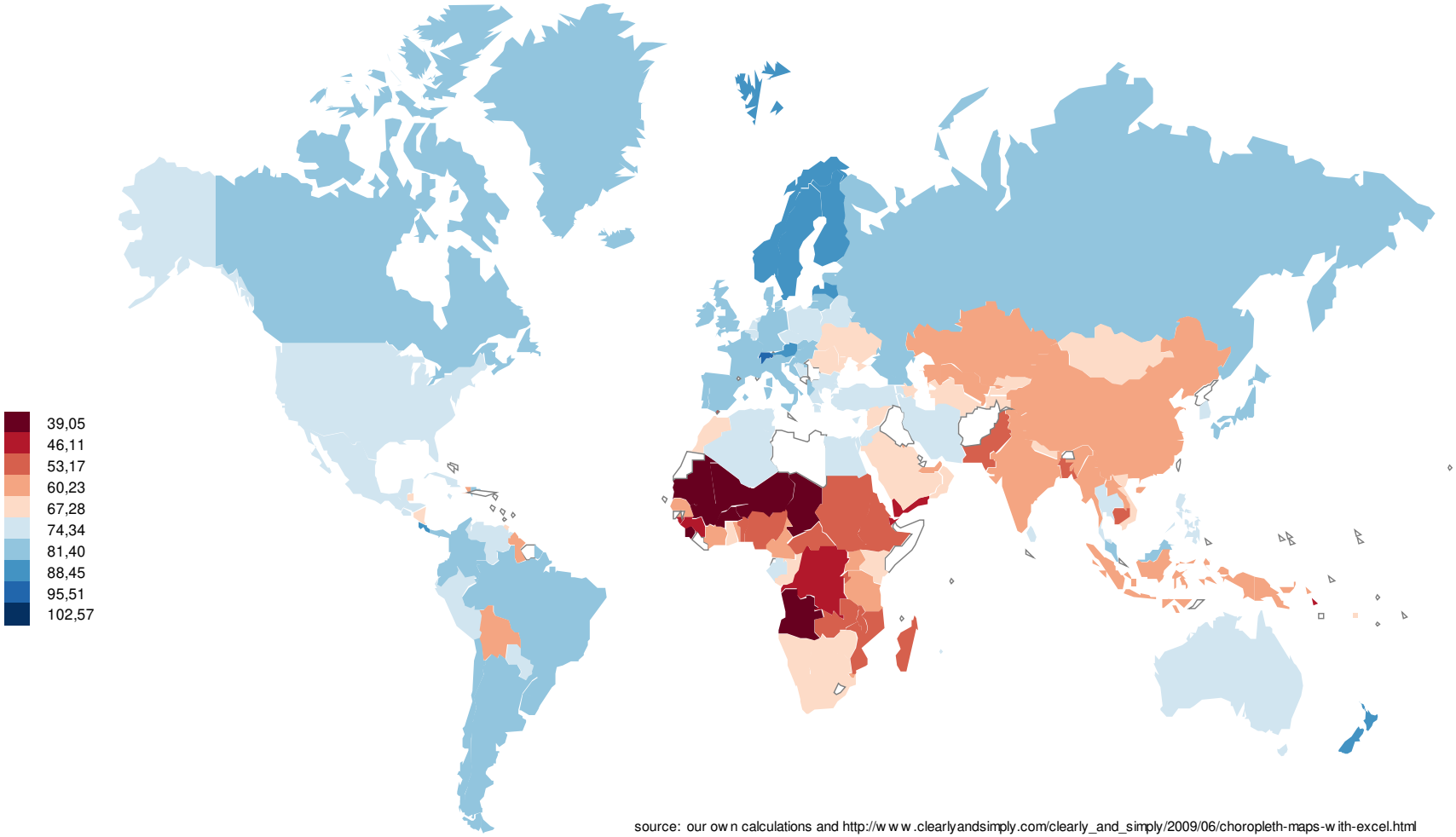
	EPI Score	**Global rank**	**percentile performance EPI Score (178 countries)**
United Arab Emirates	72,91	25	14,04
Saudi Arabia	66,66	35	19,66
Kuwait	63,94	42	23,60
Qatar	63,03	44	24,72
Egypt	61,11	50	28,09
Tunisia	58,99	52	29,21
Jordan	55,78	60	33,71
Syria	54,50	68	38,20
Morocco	51,89	81	45,51
Bahrain	51,83	82	46,07
Lebanon	50,15	91	51,12
Algeria	50,08	92	51,69
Oman	47,75	99	55,62
Libya	42,72	120	67,42
Iraq	33,39	149	83,71
Comoros	31,39	153	85,96
Yemen	30,16	157	88,20
Djibouti	28,52	161	90,45
Mauritania	27,19	165	92,70
Sudan	24,64	171	96,07
Somalia	15,47	178	100,00

Choropleth Map 8: Yale Columbia Environmental Performance Index



source: our own calculations and http://www.clearlyandsimply.com/clearly_and_simply/2009/06/choropleth-maps-with-excel.html

Choropleth Map 8: Yale Columbia Environmental Performance Index (color version)



source: our own calculations and http://www.clearlyandsimply.com/clearly_and_simply/2009/06/choropleth-maps-with-excel.html

Table 4: the growing environmental activism among Arab publics (comparison on a global scale among 57 countries[15] with complete data from the *World Values Survey*, Wave 6)

	membership rate environmental organizations	% participated in environmental demonstrations	% saying: protecting environment priority	global rank environmental organizations	global rank environmental demonstrations	global rank environment priority	average global rank
Qatar	5,50	11,70	63,10	12	9	6	9,00
Libya	3,40	10,00	54,50	21	11	21	17,67
Lebanon	5,80	15,80	39,90	11	5	41	19,00
global average	3,40	6,90	47,50	20	25	32	25,67
Kuwait	2,60	10,70	27,20	24	10	56	30,00
Palestinian Territories	1,50	5,10	46,80	34	34	34	34,00
Morocco	0,50	3,20	53,20	49	42	24	38,33
Iraq	0,80	3,00	43,00	44	44	37	41,67
Algeria	0,90	3,90	31,20	41	38	53	44,00
Jordan	0,70	2,80	35,80	46	45	47	46,00
Yemen	0,90	2,40	33,00	43	47	51	47,00
Tunisia	0,20	2,10	32,00	58	50	52	53,33
Egypt	0,30	1,20	30,50	54	54	55	54,33

[15] The global average is counted as the imaginary country number 58 in the percentile performance scales in Appendix 4 of this essay

5. Conclusions and prospects

Our macro-quantitative results should be seen in the framework of the recent tendency of cross-national research to focus on the effects of 'smart development' and 'environmental cross-national economics' (Dietz, Rosa and York, 2007, 2009; Sanderson, 2010; Tausch and Heshmati, 2011; Veenhoven, 1996; York, Rosa and Dietz, 2003). For the countries of the world system, we should state first of all that not all liberal approaches to environmental policies are falsified. In accordance with neo-liberal approaches, and in discord with the mainstream of globalization-critical research, Economic Freedom has a significant positive impact on indicators of the environment. It also emerges that world economic openness does not increase, but decreases – *ceteris paribus* – CO2 emissions per capita. The significant influence of lowering comparative price levels, i.e. the globalization of services, on our chosen indicators is equally clear. Our empirical results confirm the fact that a liberal framework does not necessarily impede a good ecological performance. It can be shown that high comparative price levels indeed lead necessarily towards a higher involvement in the net trade of ecological footprint gha per person. Reducing the net trade of ecological footprint gha per person is intrinsically linked to the globalization of services.

What are then the effects of the globalization of goods, labor and capital on the environment? Only a part of the main thrust of research, sympathizing with globalization critical movements, which is so prominent today in the literature, is fully vindicated by the significant effects of the foreign savings rate. High foreign savings, and hence, a reliance on foreign sources of savings, are indeed a driver of global footprint, and are a blockade against a satisfactory Happy Planet Index performance. The New International Division of Labor (NIDL)-model, emerges one of the prime drivers of high CO2 per capita emissions. MNC penetration, the master variable of most quantitative dependency theories, blocks environmental performance (EPI-Index). Worker remittances have a significant positive effect on the Happy Planet Index, and Happy Life Years. The percentage of the population with an 'immigration background' has – *ceteris paribus* – a negative effect on some other key indicators of the environment. Immigration, and all the transport activities it causes, increases the CO2 output of a given society, and it also increases the ratio of carbon emissions per GDP.

The most comprehensive state of the global environment index in the countries of the world is the Yale/Columbia University Environmental Performance Index. [16] While Kuwait, Qatar, Saudi Arabia, and United Arab Emirates (just as, by the way, the State of Israel) belong to the top 25% of the countries of world society according to the EPI Index, Comoros, Djibouti, Iraq, Mauritania, Somalia, Sudan, and Yemen belong to the bottom 25% performers in world society and must be categorized as the ecological problem areas of the Arab world in the years to come.

We also established that consciousness and activism in environmental areas is most developed in the relatively richer countries of Qatar and Libya, while in the other Arab countries with available *World Values Survey* data, environmental activism as yet did not materialize in a way as suggested by the data on the already existing objective environmental conditions.

[16] http://epi.yale.edu/

To arrive at a concluding perspective for the region's democratization process, we might say here that in this article we re-analyzed the solid macro-political and macro-sociological evidence on a global scale, published in the world's leading peer-reviewed social science journals, which seems to indicate that there are contradictions between unfettered globalization and unfettered world economic openness and sustainable development. Like several recent studies, most notably Jorgenson, 2003; 2004, 2005, 2006 we suggest that there seems to be a strong interaction between 'transnational capitalist penetration' and 'environmental degradation'. Global, European and also Arab policy-making finally should dare to take the globalization-critical organizations of 'civil society' seriously (Brand *et al.*, 2008).

Appendix 1: The KOF Index of Globalization in the Arab World from 1970 onwards – the overall Index

2015 KOF Index of Globalization

	Indices and Variables	Weights
A.	**Economic Globalization**	**[36%]**
	i) Actual Flows	***(50%)***
	Trade (percent of GDP)	(22%)
	Foreign Direct Investment, stocks (percent of GDP)	(27%)
	Portfolio Investment (percent of GDP)	(24%)
	Income Payments to Foreign Nationals (percent of GDP)	(27%)
	ii) Restrictions	***(50%)***
	Hidden Import Barriers	(24%)
	Mean Tariff Rate	(28%)
	Taxes on International Trade (percent of current revenue)	(26%)
	Capital Account Restrictions	(23%)
B.	**Social Globalization**	**[38%]**
	i) Data on Personal Contact	***(33%)***
	Telephone Traffic	(25%)
	Transfers (percent of GDP)	(3%)
	International Tourism	(26%)
	Foreign Population (percent of total population)	(21%)
	International letters (per capita)	(25%)
	ii) Data on Information Flows	***(35%)***
	Internet Users (per 1000 people)	(36%)
	Television (per 1000 people)	(38%)

Trade in Newspapers (percent of GDP) (26%)

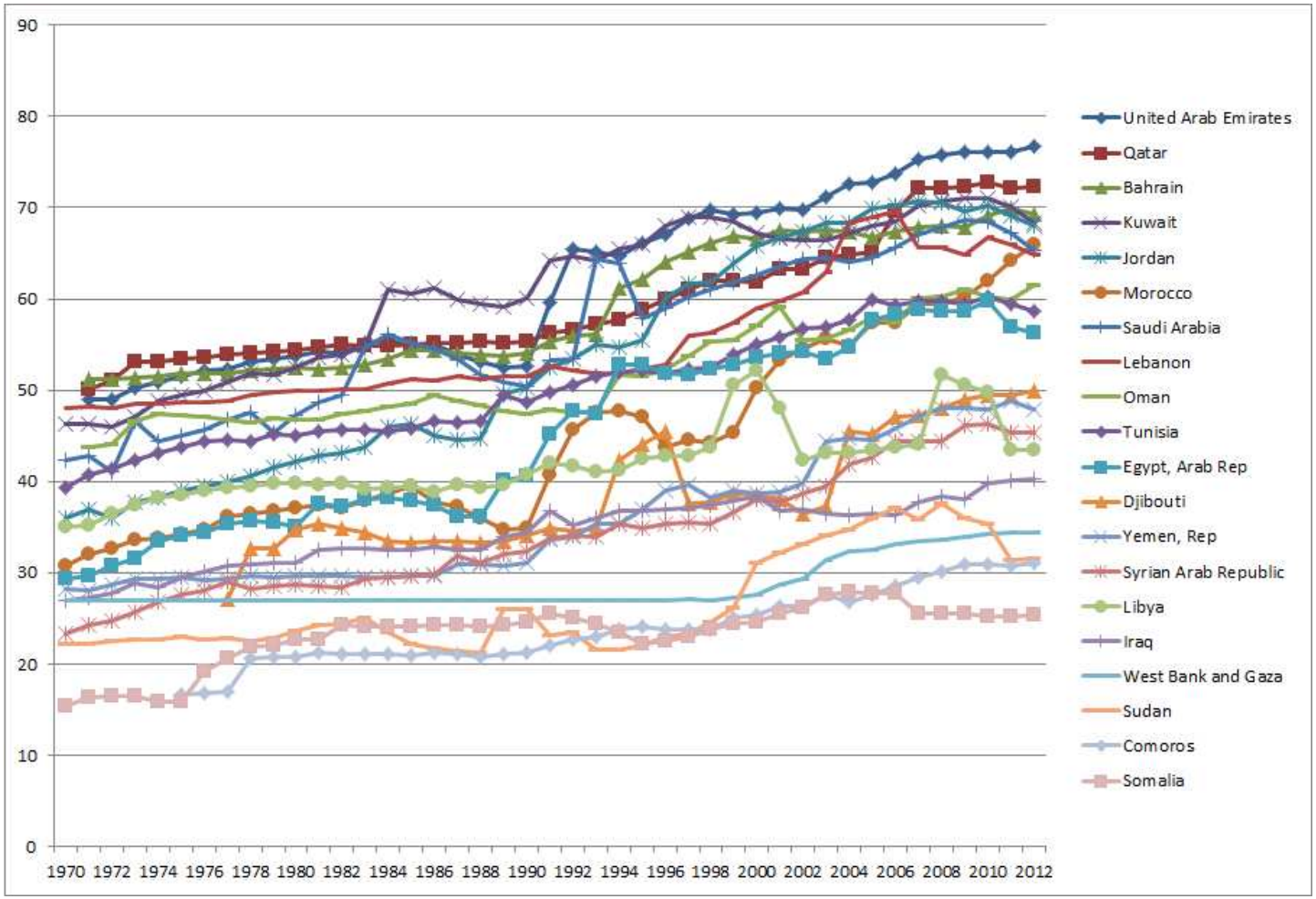
iii) Data on Cultural Proximity (32%)

Number of McDonald's Restaurants (per capita) (44%)
Number of Ikea (per capita) (44%)
Trade in books (percent of GDP) (11%)

C. Political Globalization [26%]

Embassies in Country (25%)
Membership in International Organizations (27%)
Participation in U.N. Security Council Missions (22%)
International Treaties (26%)

The overall KOF-Globalization Index for the Arab World



Appendix 2: Global Footprint Network data on environmental strains in the Arab World from 1961 onwards

http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_for_nations/

Each country has its own ecological risk profile: Many are running ecological deficits, with Footprints larger than their own biological capacity. Others depend heavily on resources from elsewhere, which are under increasing pressure.

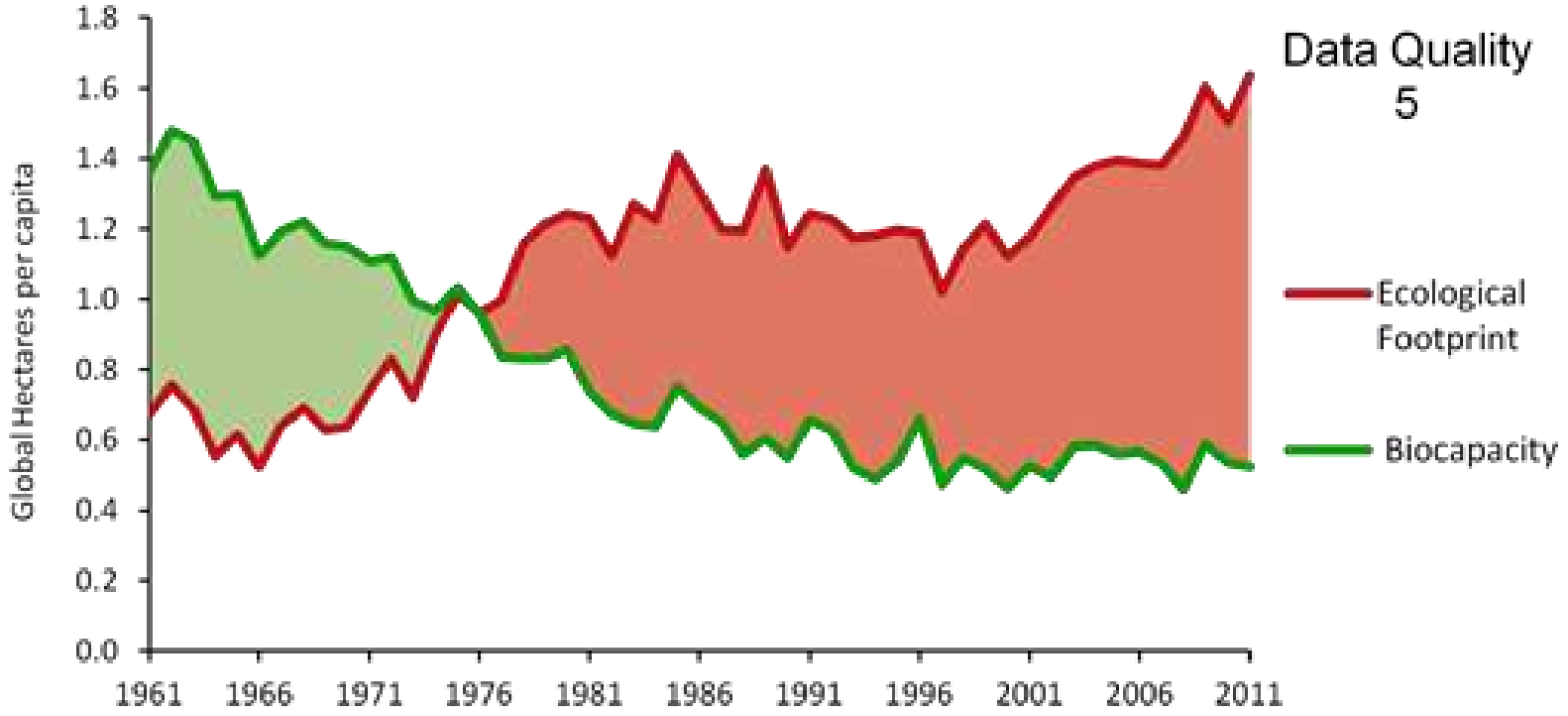
In some areas of the world, the implications of ecological deficits can be devastating, leading to resource loss, ecosystem collapse, debt, poverty, famine and war.

The Ecological Footprint is a resource accounting tool that helps countries understand their ecological balance sheet and gives them the data necessary to manage their resources and secure their future.

National governments using the Footprint are able to:
1.Assess the value of their country's ecological assets
2.Monitor and manage their assets
3.Identify the risks associated with ecological deficits
4.Set policy that is informed by ecological reality and makes safeguarding resources a top priority
5.Measure progress toward their goals

The graphs track the per-person Ecological Footprint and biocapacity in the Arab world since 1961. Both are measured in global hectares. Biocapacity per person varies each year with ecosystem management, agricultural practices (such as fertilizer use and irrigation), ecosystem degradation, and weather, and population size. Footprint per person varies with consumption amounts and production efficiency. Where a dotted line is shown, interpolation estimates have been used by the Global Footprint Network in place of highly unlikely outliers in the results. While most input data for the Footprint accounts come from UN statistical sources, the quality of country results varies. The quality of the assessment is scored on a 1-6 scale, and is provided for the Arab world in the upper-right corner of the graph.

ALGERIA


Global Hectares per capita
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1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
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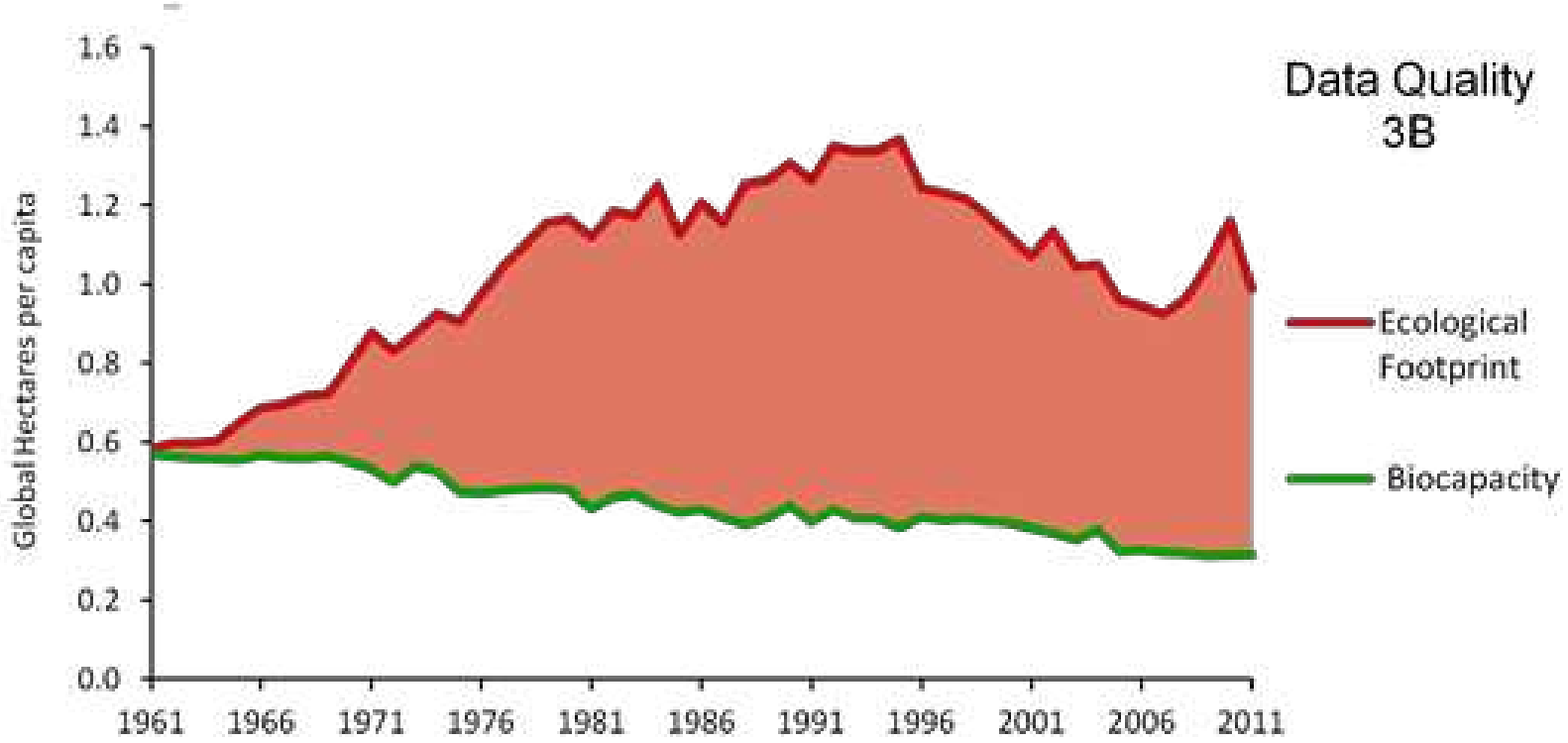
1961
1966
1971
1976
1981
1986
1991
1996
2001
2006
2011
Data Quality
5
Ecological Footprint
Biocapacity

COMOROS


Global Hectares per capita
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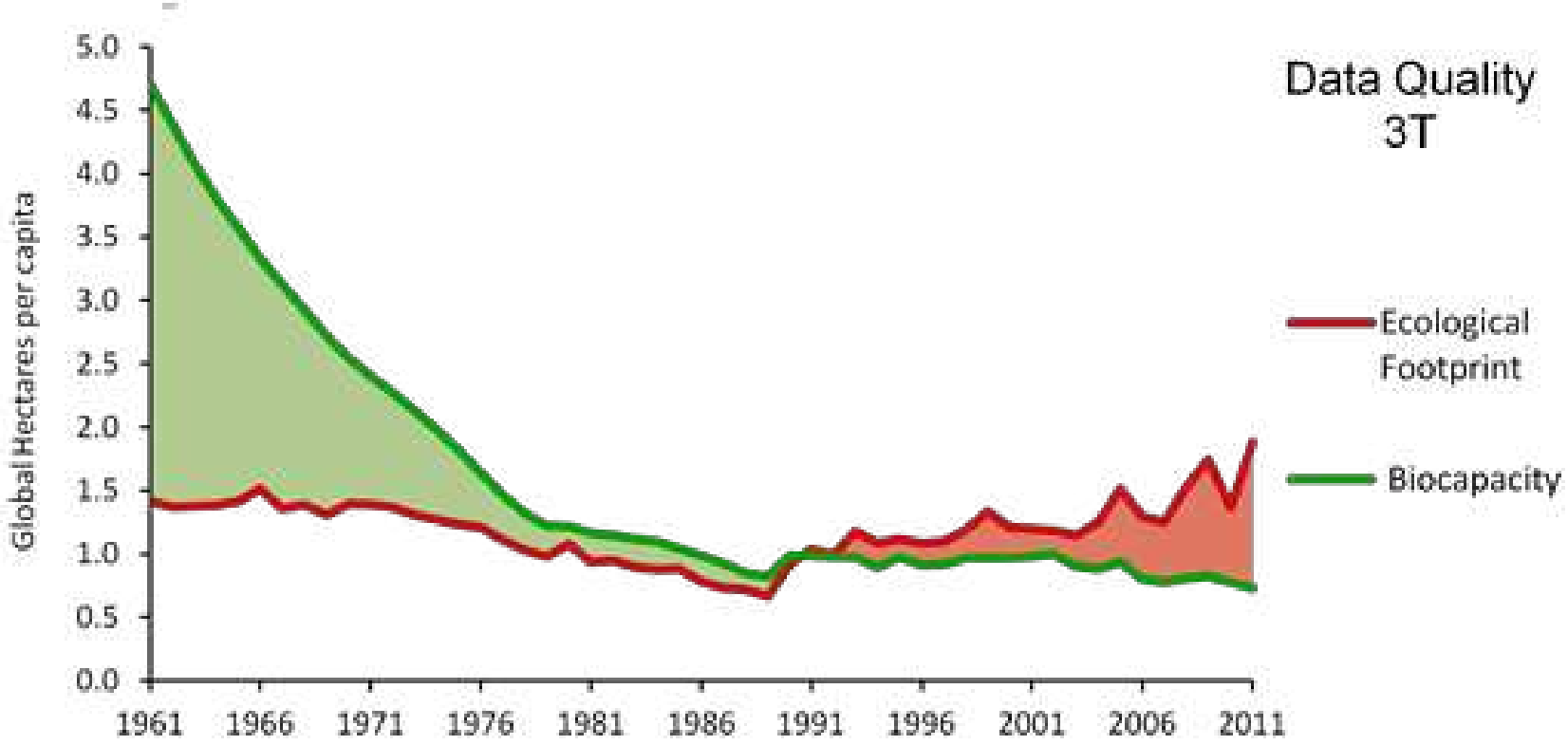
Data Quality
3T
Global Hectares per capita
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4.0
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3.0
2.5
2.0
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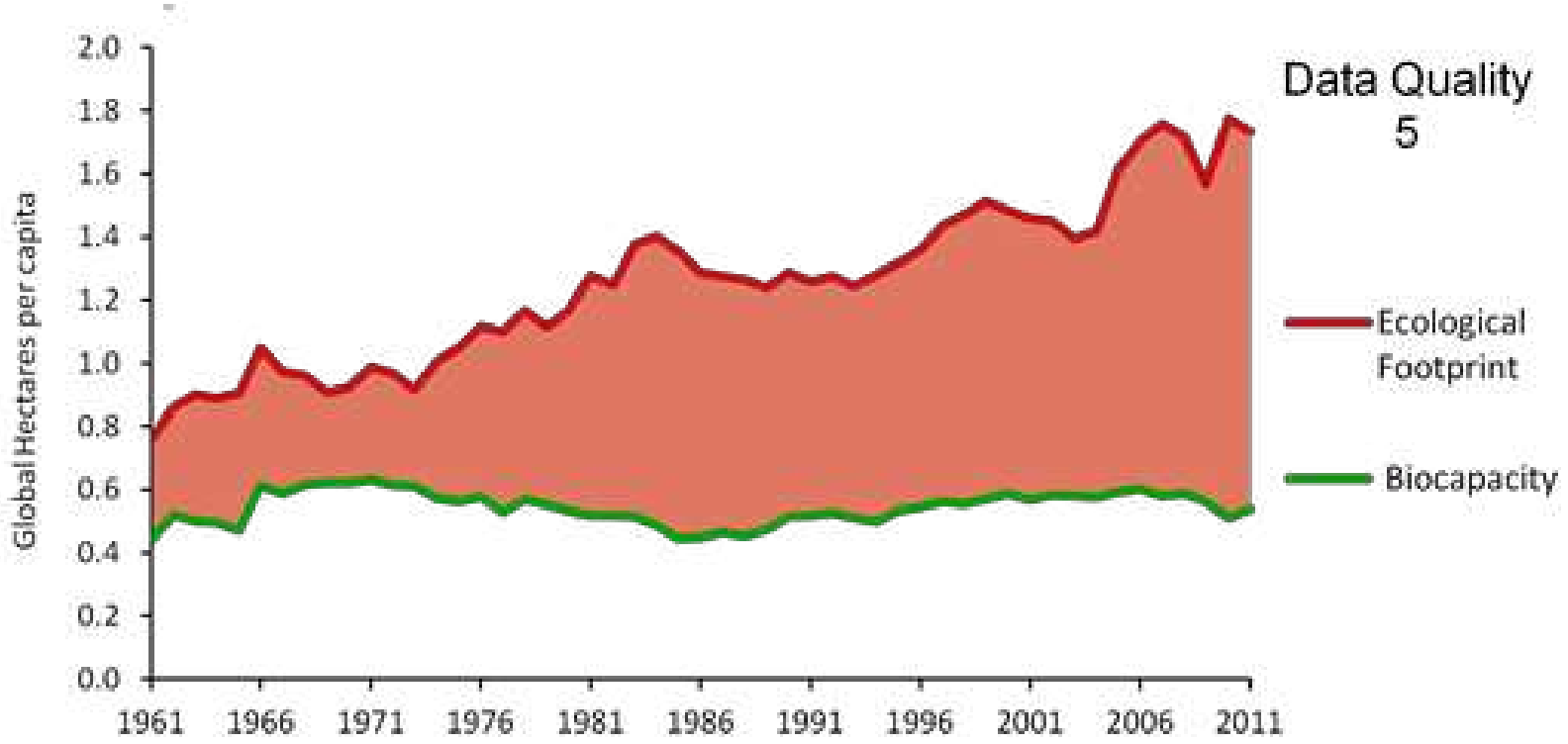
Ecological Footprint
Biocapacity

EGYPT


Global Hectares per capita
2.0
1.8
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1.4
1.2
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1961
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Data Quality
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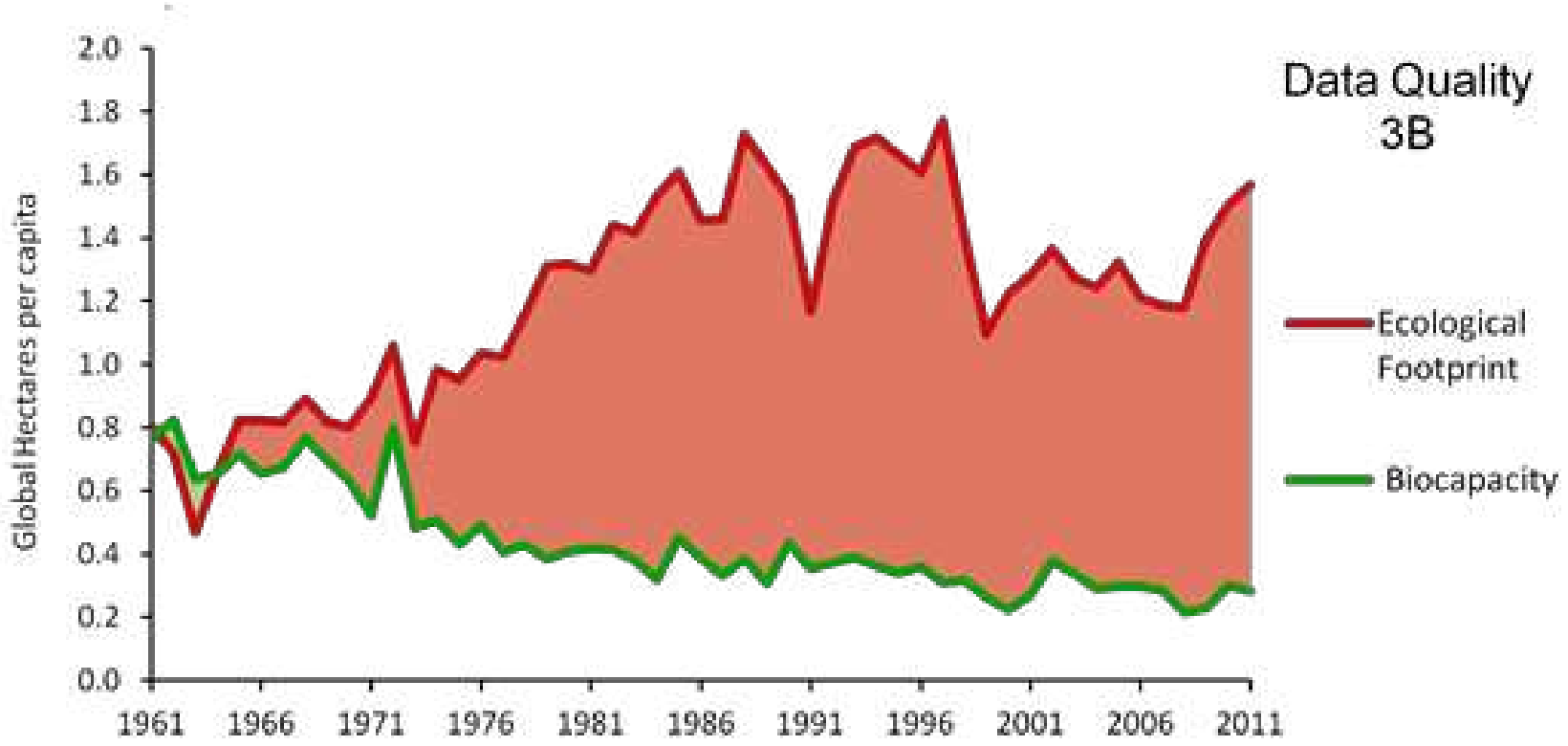
Ecological Footprint
Biocapacity

IRAQ


Global Hectares per capita
2.0
1.8
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1.0
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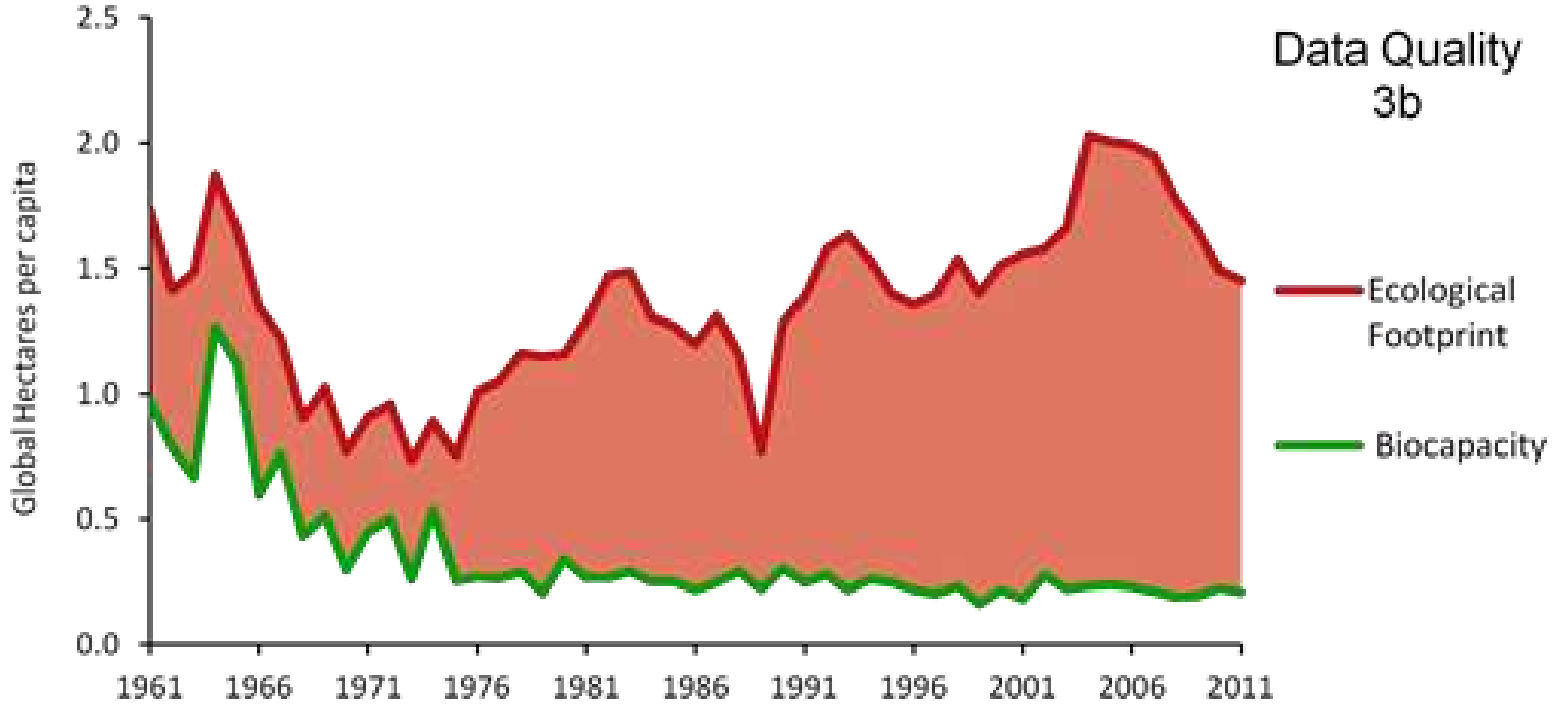
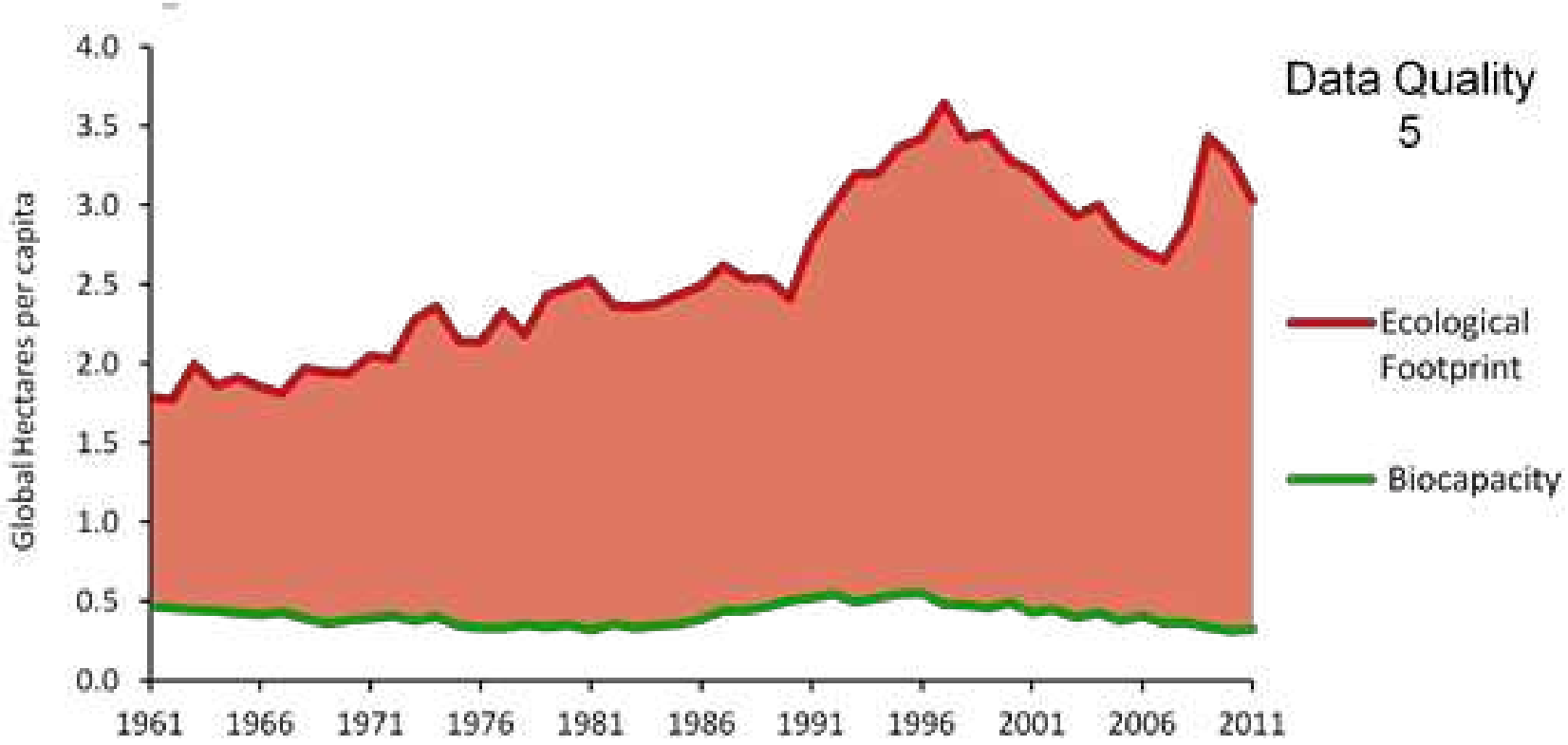
Data Quality
3B
Ecological Footprint
Biocapacity

JORDAN


Global Hectares per capita
2.5
2.0
1.5
1.0
0.5
0.0
1961
1966
1971
1976
1981
1986
1991
1996
2001
2006
2011
Data Quality
3b
Ecological Footprint
Biocapacity

LEBANON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3.5
3.0
2.5
2.0
1.5
1.0
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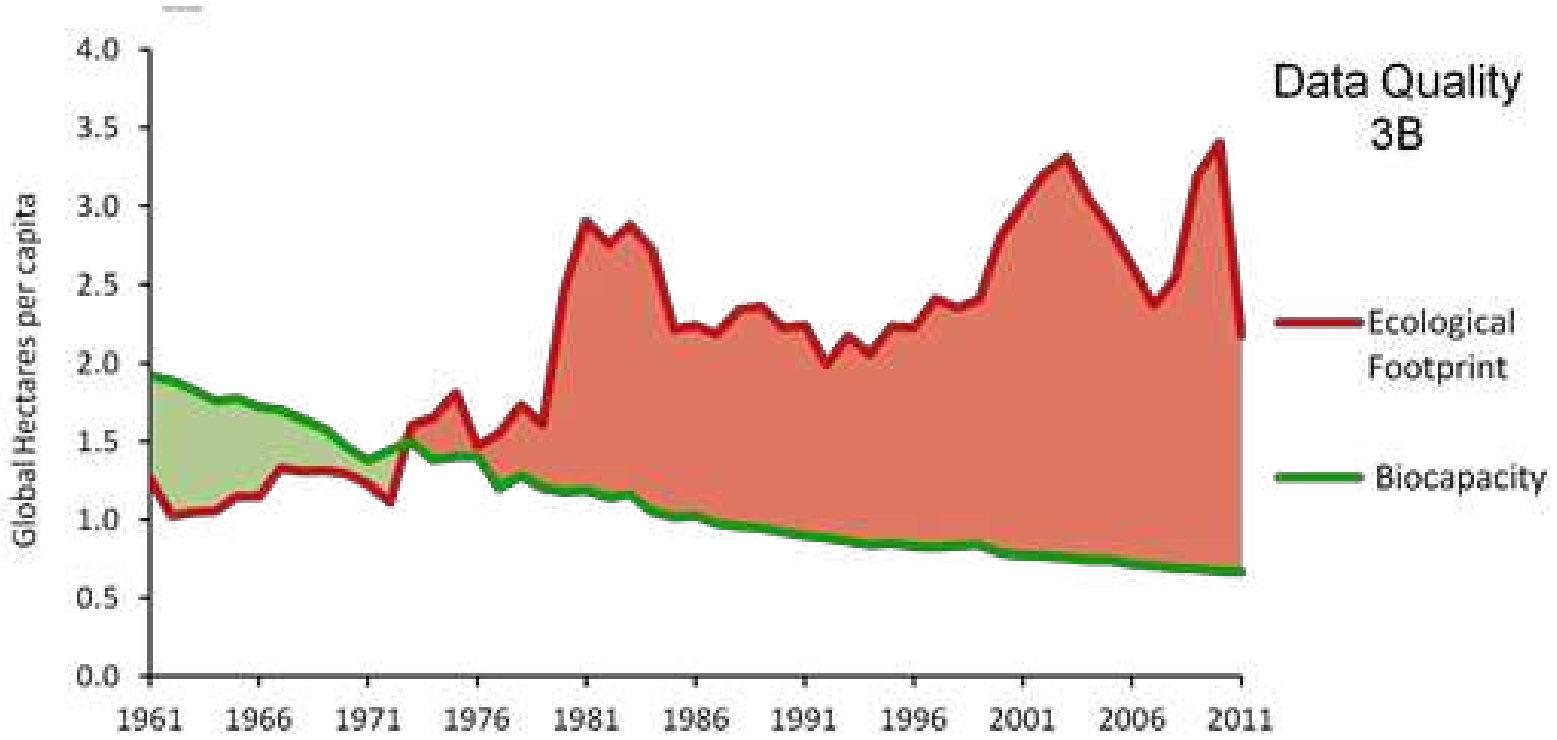
1961
1966
1971
1976
1981
1986
1991
1996
2001
2006
2011
Data Quality
5
Ecological Footprint
Biocapacity

LIBYA


Global Hectares per capita
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3.5
3.0
2.5
2.0
1.5
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1966
1971
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1981
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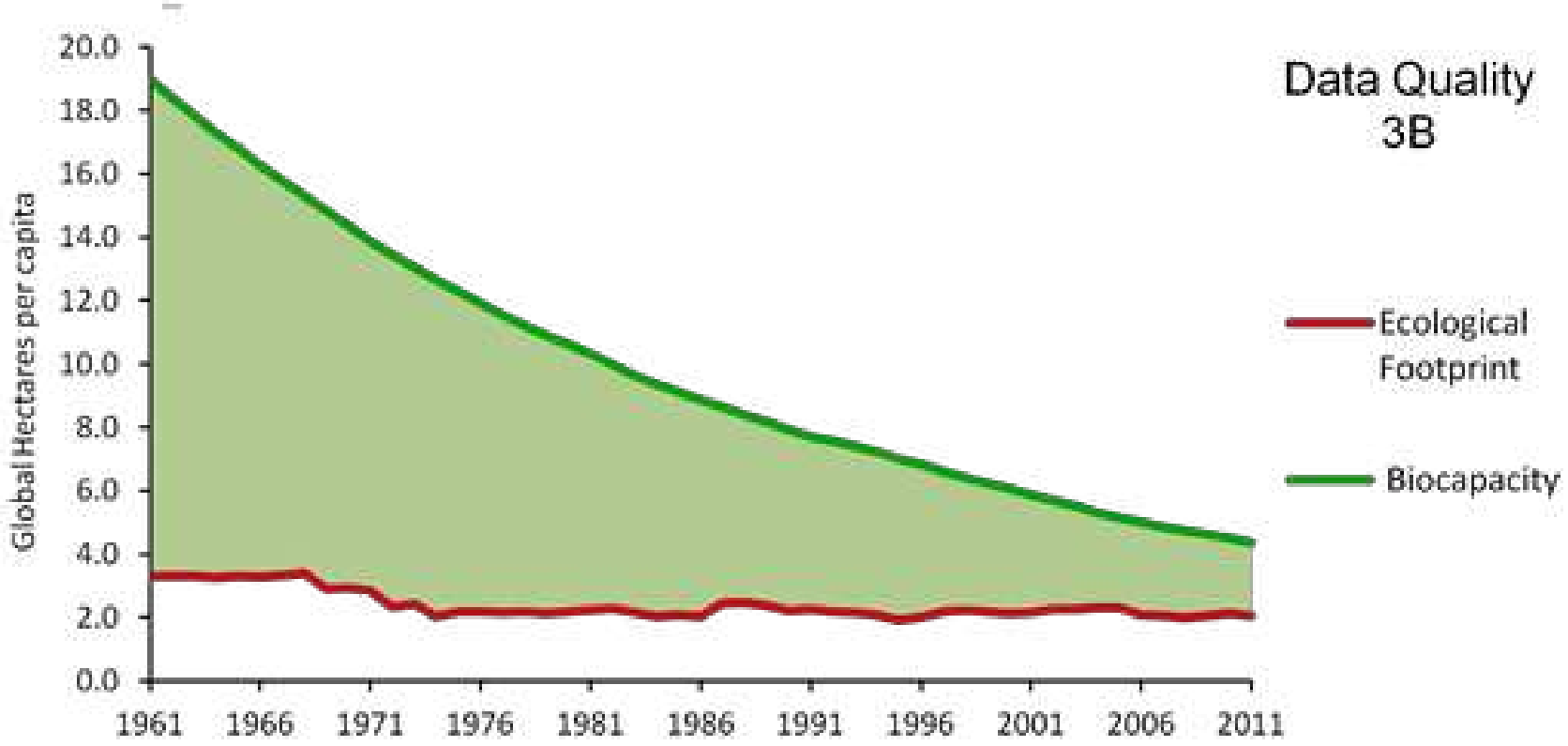
2011
Data Quality
3B
Ecological Footprint
Biocapacity

MAURITANIA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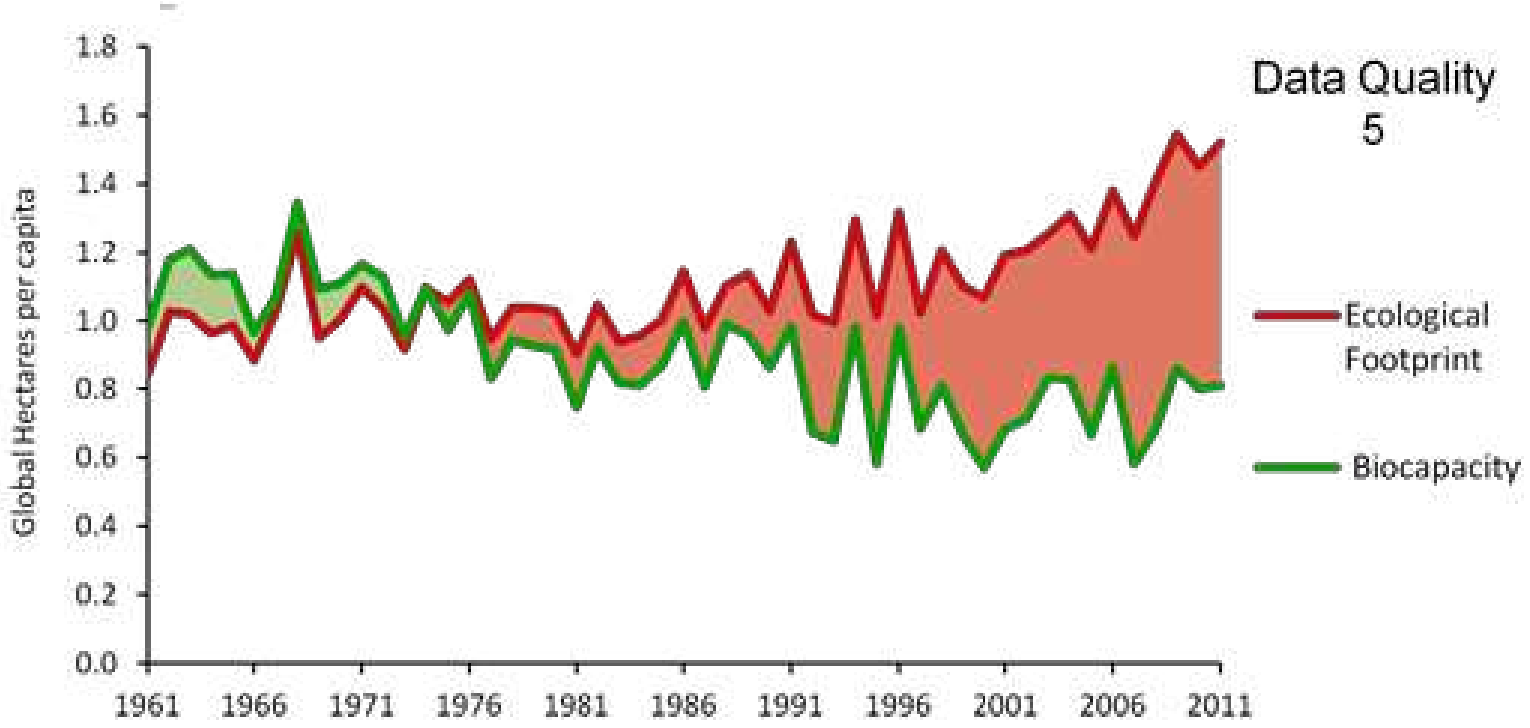
0.0
1961
1966
1971
1976
1981
1986
1991
1996
2001
2006
2011
Data Quality
3B
Ecological Footprint
Biocapacity

MOROCCO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1.6
1.4
1.2
1.0
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0.6
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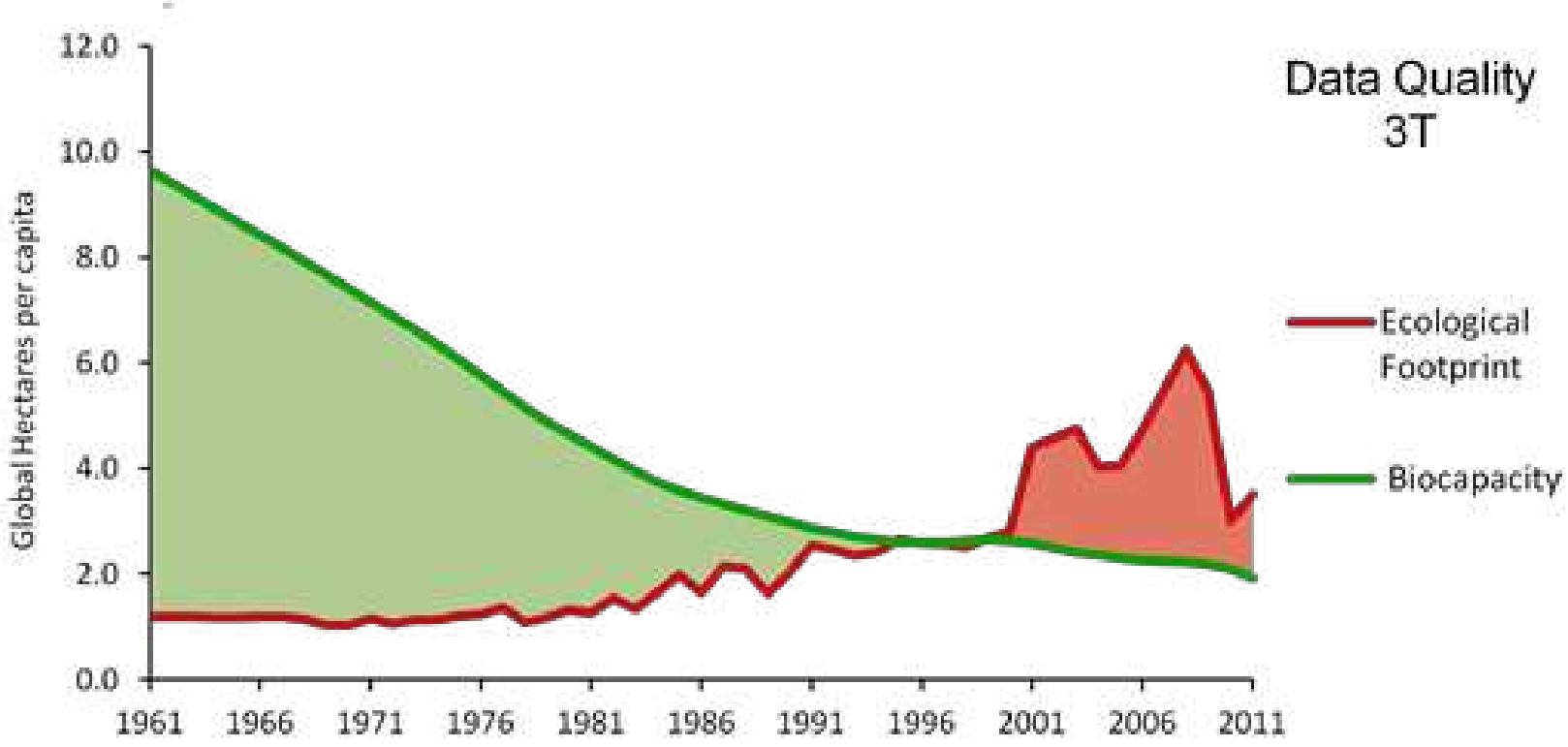
Data Quality
5
Ecological Footprint
Biocapacity

OMAN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4.0
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1971
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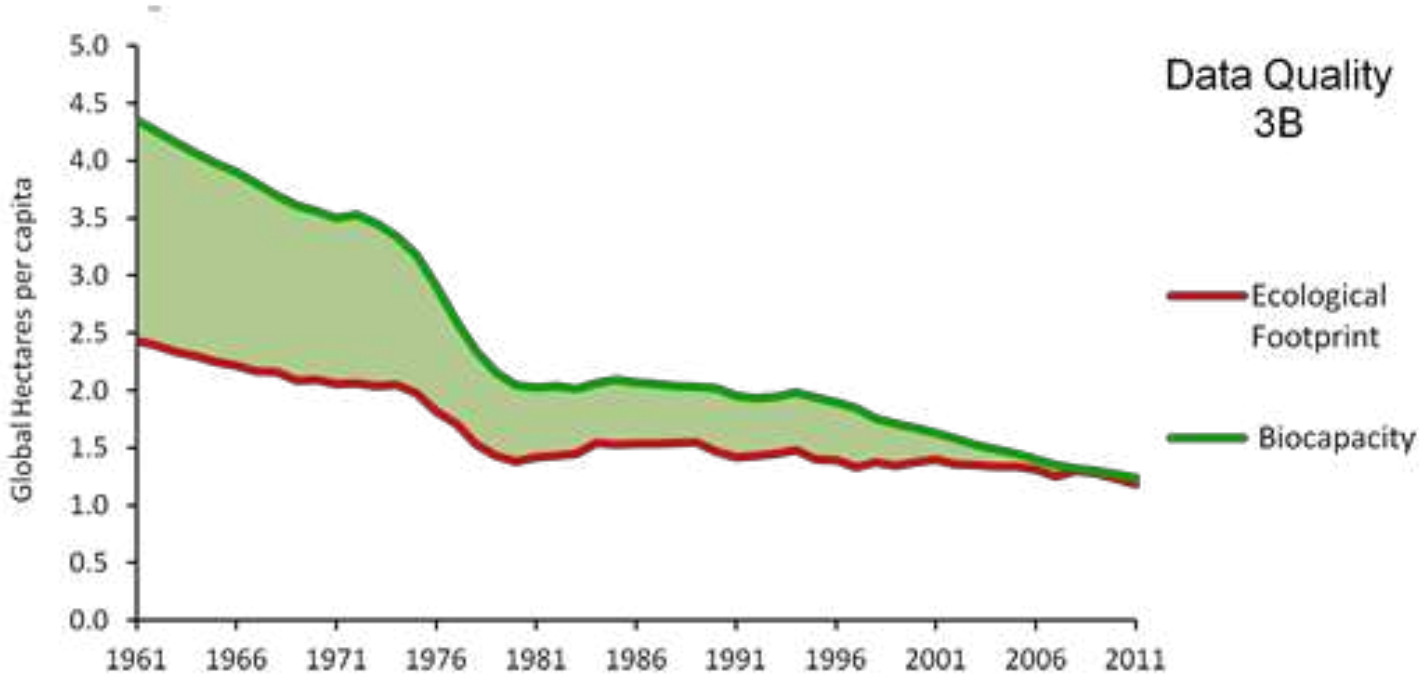
2001
2006
2011
Ecological Footprint
Biocapacity

SOMALIA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3.0
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2.0
1.5
1.0
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1961
1966
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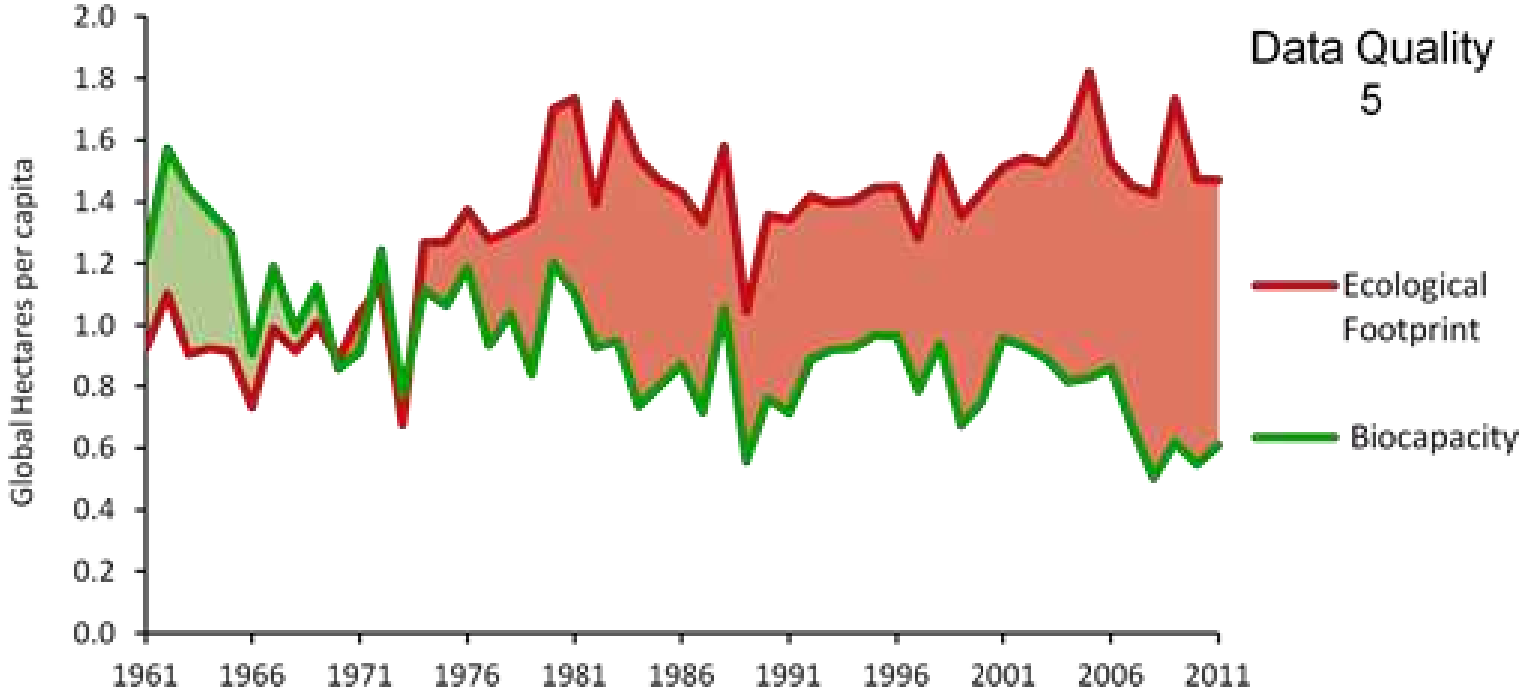
2011
Data Quality
3B
Ecological Footprint
Biocapacity

SYRIA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1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1961
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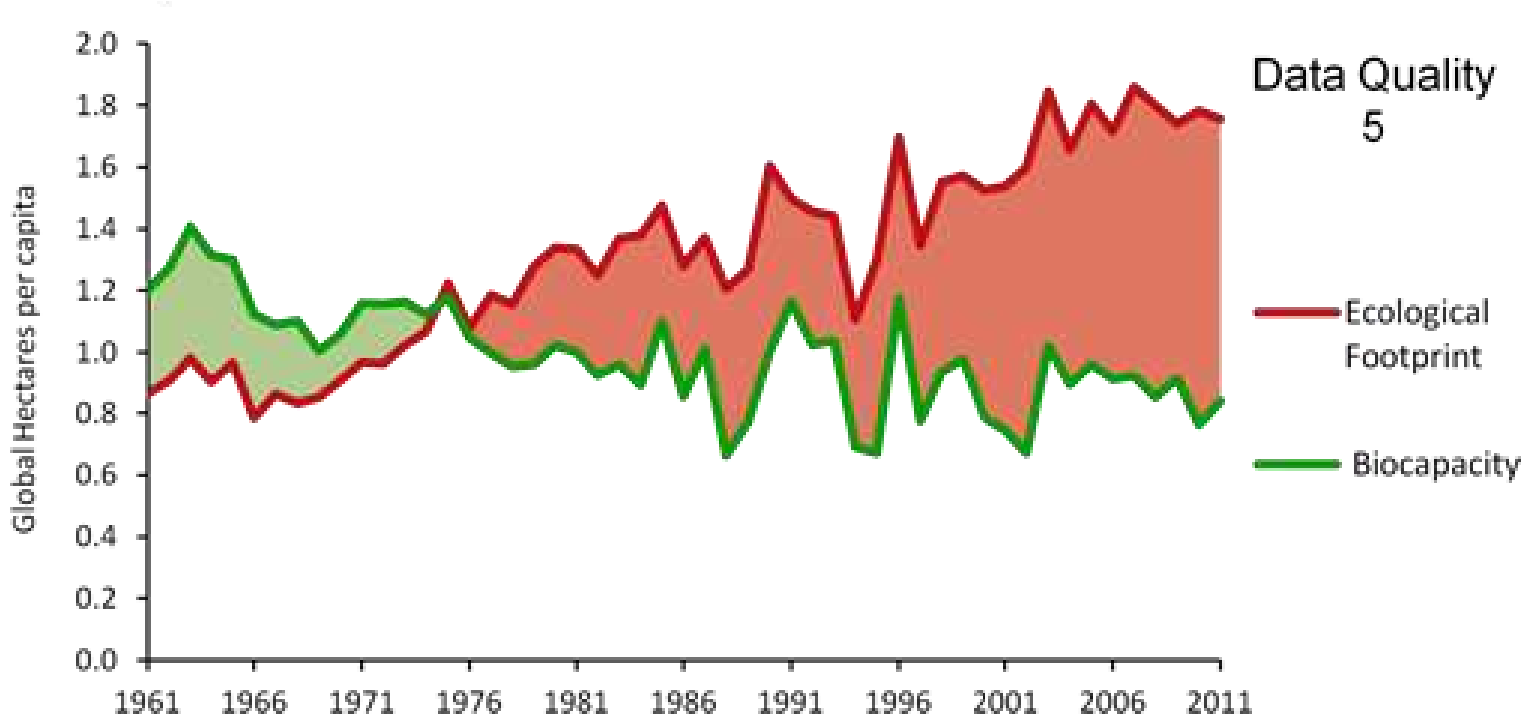
Data Quality
5
Ecological Footprint
Biocapacity

TUNISIA


Global Hectares per capita
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1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1961
1966
1971
1976
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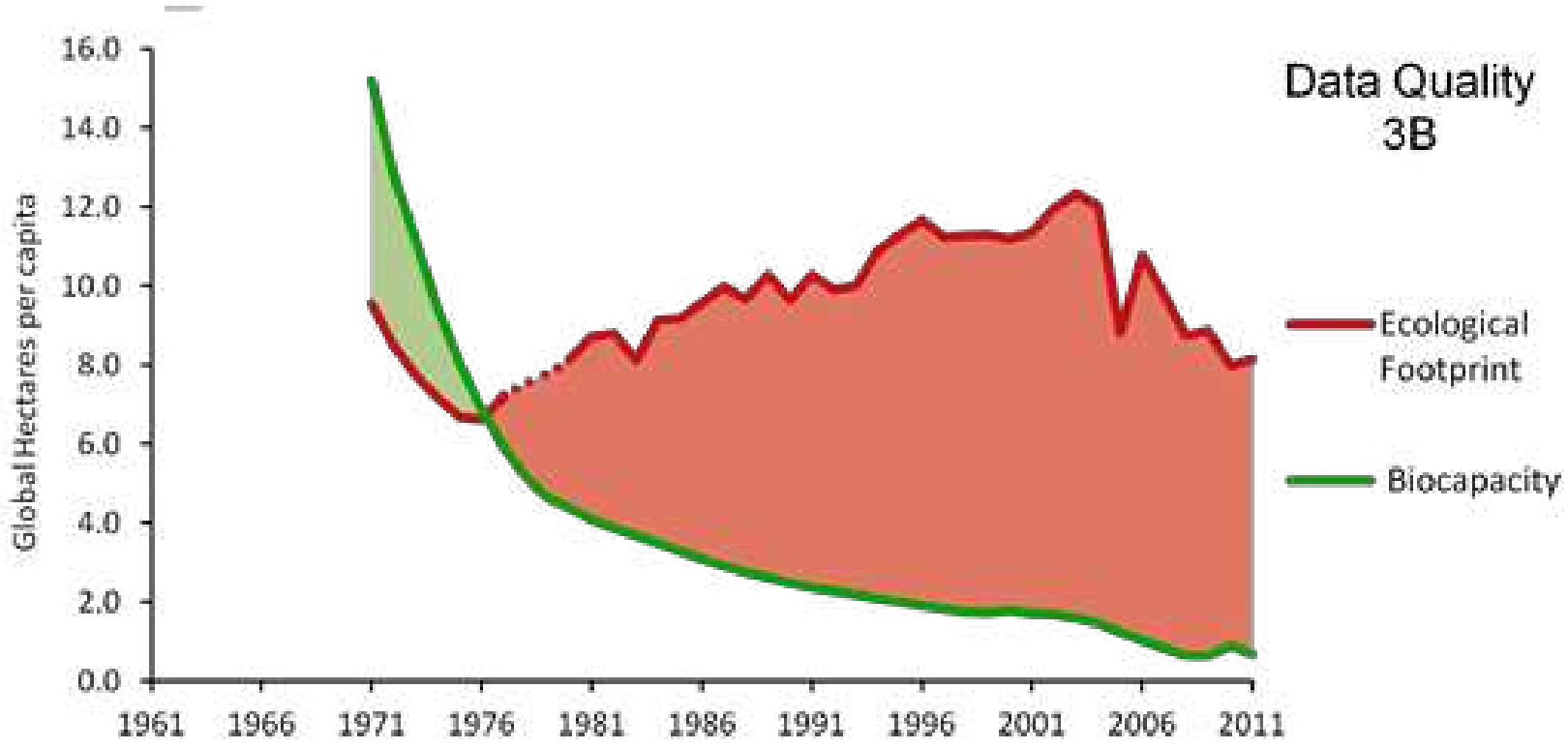
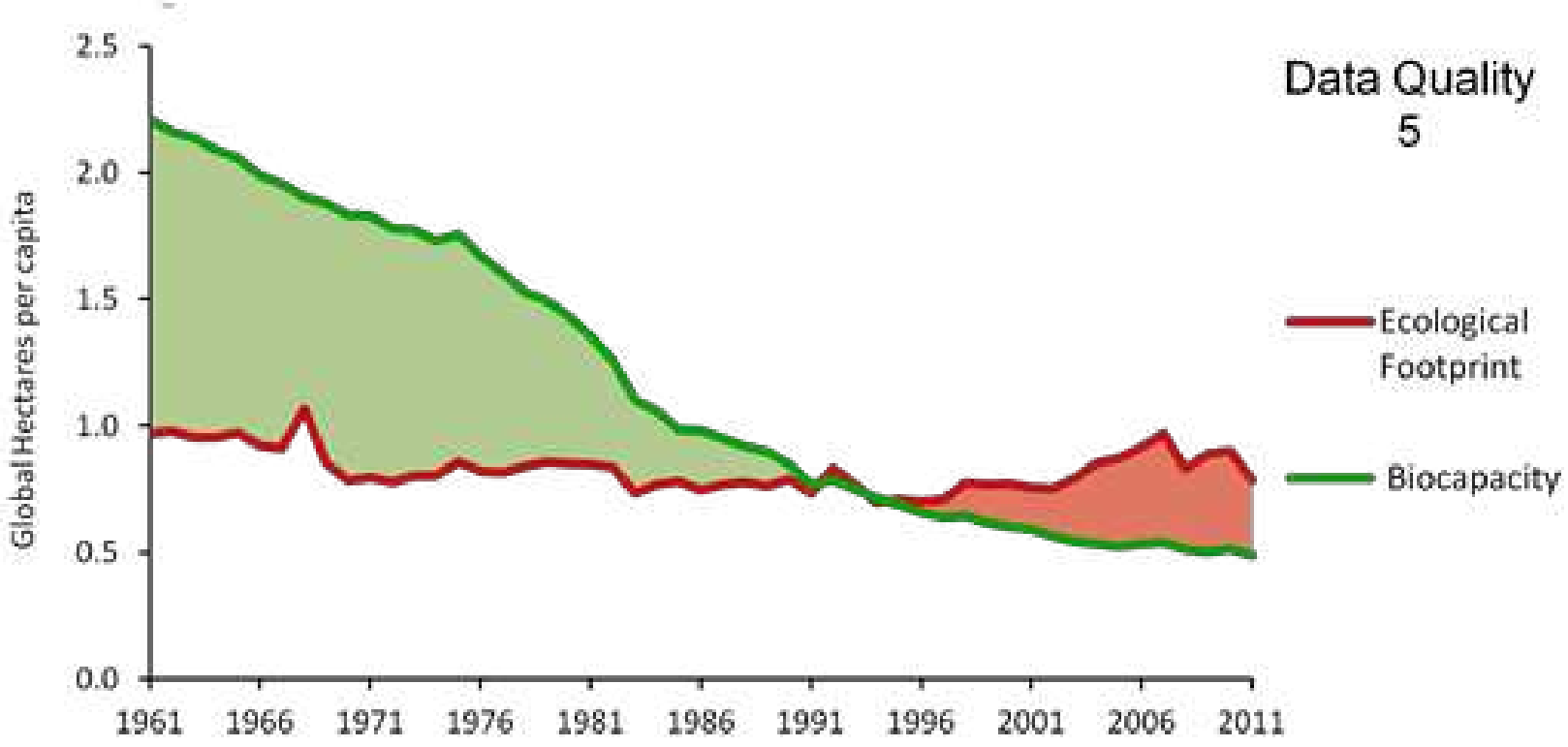
1996
2001
2006
2011
Data Quality
5
Ecological Footprint
Biocapacity

UNITED ARAB EMIRATES



YEMEN


Data Quality
5
Ecological Footprint
Biocapacity
Global Hectares per capita
2.5
2.0
1.5
1.0
0.5
0.0
1961
1966
1971
1976
1981
1986
1991
1996
2001
2006
2011

Appendix 3: multiple regressions – the dependency model, tested against feminist, demographic, neoliberal, geographic, cultural, peace research, human capital policy predictors, migration theories and integration theories

Predictors (pre-selection of the significant predictors by prior selection, using stepwise regression)

% women in government, all levels
% world population
2000 Economic Freedom Score
Absolute latitude
Annual population growth rate, 1975-2005 %)
comparative price levels (US=1.00)
foreign savings rate
FPZ (free production zones) employment as % of total population
ln GDP per capita
ln GDP per capita ^2
Membership in the Islamic Conference
military expenditures per GDP
military personnel rate ln (MPR+1)
MNC outward investments (stock) per GDP
MNC PEN - stock of Inward FDI per GDP
MNC PEN: DYN MNC PEN 1995-2005
Openness-Index, 1990 (export-share per GDP + import-share per GDP)
population density
public education expenditure per GNP
UNDP education index
worker remittance inflows as % of GDP
Immigration - Share of population 2005 (%)
Muslim population share per total population
net international migration rate, 2005-2010

Years of membership in the EU, 2010
years of membership in EMU, 2010

The reported equations were chosen from the following dependent variables:

ecological footprint (g ha /cap)
Environmental Performance Index (EPI)
Happy life years
Happy Planet Index, HPI
avoiding net trade of ecological footprint gha per person
ln (number of people per mill inhabitants 1980-2000 killed by natural disasters per year+1)
Carbon emissions per million US dollars GDP
Carbon emissions per capita

Dependent variable	**results from stepwise regression**	**statistical properties**	**statistical properties**	**statistical properties**	**statistical properties**	**statistical properties**	**Development dimension**
Environmental Performance Index (EPI)	**Independent Variable**	**B**	**standard error**	**Beta**	**t-value**	**error probability**	**environment**
	Constant	-66.751	27.623		-2.417	0.017	
	% world population	-0.548	0.216	-0.100	-2.536	0.012	
	ln GDP per capita	23.041	6.605	2.158	3.489	0.001	
	ln GDP per capita ^2	-1.084	0.374	-1.750	-2.898	0.004	
	military personnel rate ln (MPR+1)	**-3.298**	**0.806**	**-0.174**	**-4.091**	**0.000**	
	MNC PEN - stock of Inward FDI per GDP	**-0.094**	**0.033**	**-0.113**	**-2.871**	**0.005**	
	UNDP education index	36.930	4.216	0.560	8.760	0.000	
	memorandum item: statistical properties of the equation	adj R^2	df	F	error probability of the entire equation		
		78.900	140.000	88.259	.000		
Global footprint	**Independent Variable**	**B**	**standard error**	**Beta**	**t-value**	**error probability**	**environment**
Global footprint	Constant	31.026	4.440		6.988	0.000	
	foreign savings rate	**0.017**	**0.009**	**0.082**	**1.872**	**0.063**	
	ln GDP per capita	-8.365	1.065	-4.870	-7.851	0.000	
	ln GDP per capita ^2	0.580	0.063	5.838	9.203	0.000	
	population density	0.000	0.000	-0.089	-2.283	0.024	
	years of membership in EMU, 2010	-0.128	0.042	-0.141	-3.037	0.003	
	memorandum item: statistical properties of the equation	adj R^2	df	F	error probability of the entire equation		
		81.200	135.000	117.592	.000		
ln (number of people per mill inhabitants 1980-	**Independent Variable**	**B**	**standard error**	**Beta**	**t-value**	**error probability**	**environment**

2000 killed by natural disasters per year+1)							
	Constant	-15.273	5.398		-2.830	0.005	
	ln GDP per capita	4.262	1.287	3.751	3.312	0.001	
	ln GDP per capita ^2	-0.247	0.074	-3.741	-3.355	0.001	
	UNDP education index	-2.011	0.839	-0.289	-2.397	0.018	
	Immigration - Share of population 2005 (%)	**-0.018**	**0.012**	**-0.124**	**-1.497**	**0.136**	
	memorandum item: statistical properties of the equation	adj R^2	df	F	error probability of the entire equation		
		14.400	159.000	7.713	.000		
CO2 per capita	**Independent Variable**	**B**	**standard error**	**Beta**	**t-value**	**error probability**	**environment**
	Constant	32.170	12.138		2.650	0.009	
	FPZ (free production zones) employment as % of total population	**0.331**	**0.063**	**0.238**	**5.281**	**0.000**	
	ln GDP per capita	-9.438	2.877	-2.104	-3.281	0.001	
	ln GDP per capita ^2	0.706	0.168	2.713	4.214	0.000	
	Openness-Index, 1990 (export-share per GDP + import-share per GDP)	**-0.020**	**0.006**	**-0.164**	**-3.240**	**0.001**	
	population density	-0.001	0.001	-0.121	-2.710	0.007	
	Immigration - Share of population 2005 (%)	**0.168**	**0.025**	**0.348**	**6.811**	**0.000**	
	memorandum item: statistical properties of the equation	adj R^2	df	F	error probability of the entire equation		
		72.700	159.000	71.594	.000		
Carbon emissions per million US dollars GDP	**Independent Variable**	**B**	**standard error**	**Beta**	**t-value**	**error probability**	**environment**
	Constant	-6595.543	1383.628		-4.767	0.000	
	2000 Economic Freedom Score	-7.988	3.279	-0.236	-2.436	0.016	
	Absolute latitude	12.325	2.012	0.544	6.125	0.000	
	ln GDP per capita	1792.705	325.022	5.614	5.516	0.000	

	ln GDP per capita ^2	-111.407	19.201	-6.024	-5.802	0.000	
	Immigration - Share of population 2005 (%)	**8.903**	**2.615**	**0.267**	**3.404**	**0.001**	
	memorandum item: statistical properties of the equation	adj R^2	df	F	error probability of the entire equation		
		35.000	144.000	16.535	.000		
avoiding net trade of ecological footprint gha per person	**Independent Variable**	**B**	**standard error**	**Beta**	**t-value**	**error probability**	**global ecological justice**
	Constant	-85.394	31.144		-2.742	0.007	
	% women in government, all levels	-0.130	0.072	-0.125	-1.801	0.074	
	comparative price levels (US=1.00)	**-8.056**	**2.312**	**-0.401**	**-3.485**	**0.001**	
	ln GDP per capita	22.761	7.550	3.880	3.015	0.003	
	ln GDP per capita ^2	-1.436	0.462	-4.195	-3.109	0.002	
	Years of membership in the EU, 2010	**0.234**	**0.050**	**0.396**	**4.716**	**0.000**	
	memorandum item: statistical properties of the equation	adj R^2	df	F	error probability of the entire equation		
		40.900	138.000	20.111	.000		
Happy Planet Index	**Independent Variable**	**B**	**standard error**	**Beta**	**t-value**	**error probability**	**happiness**
	Constant	-280.000	46.695		-5.996	0.000	
	foreign savings rate	**-0.236**	**0.112**	**-0.189**	**-2.105**	**0.037**	
	ln GDP per capita	73.912	11.094	7.100	6.662	0.000	
	ln GDP per capita ^2	-4.158	0.649	-6.908	-6.411	0.000	
	worker remittance inflows as % of GDP	**0.587**	**0.135**	**0.356**	**4.346**	**0.000**	
	memorandum item: statistical properties of the equation	adj R^2	df	F	error probability of the entire equation		
		38.000	119.000	19.217	.000		
Happy Life Years	**Independent Variable**	**B**	**standard error**	**Beta**	**t-value**	**error probability**	**happiness**

	Constant	-87.614	35.855		-2.444	0.016	
	ln GDP per capita	19.100	8.451	1.542	2.260	0.026	
	ln GDP per capita ^2	-0.460	0.490	-0.644	-0.938	0.350	
	military expenditures per GDP	**-0.754**	**0.318**	**-0.113**	**-2.370**	**0.020**	
	worker remittance inflows as % of GDP	**0.257**	**0.112**	**0.118**	**2.295**	**0.024**	
	memorandum item: statistical properties of the equation	adj R^2	df	F	error probability of the entire equation		
		77.100	102.000	86.653	.000		

Appendix 4: *World Values Survey* data on environmental activism *(World Values Survey, wave 6)*

- % active membership rate (per total adult population) in environmental organizations
- % of the total adult population already participated in environmental demonstrations
- % of the total adult population saying: protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs
- global rank % active membership rate (per total adult population) in environmental organizations
- global rank % of the total adult population already participated in environmental demonstrations
- global rank % of the total adult population saying: protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs
- average global rank
- percentile performance % active membership rate (per total adult population) in environmental organizations
- percentile performance % of the total adult population already participated in environmental demonstrations
- percentile performance % of the total adult population saying: protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs
- average percentile performance

	membership rate environmental organizations	environmental demonstrations	protecting environment priority	global rank environmental organizations	global rank environmental demonstrations	global rank environment priority	average global rank	percentile performance membership rate	percentile performance environmental demonstrations	percentile performance environment priority	average percentile performance
Colombia	9,50	18,10	67,00	4,00	3,00	2,00	3,00	6,90	5,17	3,45	5,17
Mexico	7,10	14,40	62,80	7,00	6,00	9,00	7,33	12,07	10,34	15,52	12,64
Peru	3,90	21,30	62,90	17,00	2,00	7,00	8,67	29,31	3,45	12,07	14,94
Qatar	5,50	11,70	63,10	12,00	9,00	6,00	9,00	20,69	15,52	10,34	15,52
Philippines	15,50	5,40	64,90	1,00	32,00	4,00	12,33	1,72	55,17	6,90	21,26
Hong Kong	8,00	8,80	58,60	6,00	14,00	17,00	12,33	10,34	24,14	29,31	21,26
Malaysia	3,10	8,40	73,60	23,00	17,00	1,00	13,67	39,66	29,31	1,72	23,56
Chile	1,60	13,70	66,70	32,00	7,00	3,00	14,00	55,17	12,07	5,17	24,14
India	12,90	29,50	38,10	2,00	1,00	43,00	15,33	3,45	1,72	74,14	26,44
Kyrgyzstan	4,30	7,70	59,30	15,00	18,00	14,00	15,67	25,86	31,03	24,14	27,01
Australia	4,20	7,60	59,00	16,00	20,00	16,00	17,33	27,59	34,48	27,59	29,89
Libya	3,40	10,00	54,50	21,00	11,00	21,00	17,67	36,21	18,97	36,21	30,46
Lebanon	5,80	15,80	39,90	11,00	5,00	41,00	19,00	18,97	8,62	70,69	32,76
Taiwan	9,70	3,10	60,60	3,00	43,00	12,00	19,33	5,17	74,14	20,69	33,33
Ecuador	2,20	7,70	61,20	29,00	19,00	11,00	19,67	50,00	32,76	18,97	33,91
Uzbekistan	1,10	8,50	62,10	37,00	15,00	10,00	20,67	63,79	25,86	17,24	35,63
Brazil	2,40	7,40	60,30	27,00	22,00	13,00	20,67	46,55	37,93	22,41	35,63
Nigeria	7,10	17,20	33,80	8,00	4,00	50,00	20,67	13,79	6,90	86,21	35,63
Thailand	6,40	5,00	57,50	10,00	35,00	18,00	21,00	17,24	60,34	31,03	36,21
South Africa	6,60	9,80	38,30	9,00	12,00	42,00	21,00	15,52	20,69	72,41	36,21
Ghana	5,40	5,50	50,30	13,00	30,00	25,00	22,67	22,41	51,72	43,10	39,08
Argentina	2,40	7,30	54,20	26,00	23,00	22,00	23,67	44,83	39,66	37,93	40,80
Uruguay	0,50	7,60	64,20	50,00	21,00	5,00	25,33	86,21	36,21	8,62	43,68

global average	**3,40**	**6,90**	**47,50**	20,00	25,00	32,00	25,67	34,48	43,10	55,17	44,25
Sweden	1,50	5,00	62,90	35,00	36,00	8,00	26,33	60,34	62,07	13,79	45,40
New Zealand	8,30	4,60	42,60	5,00	37,00	38,00	26,67	8,62	63,79	65,52	45,98
South Korea	2,60	6,10	48,20	25,00	29,00	27,00	27,00	43,10	50,00	46,55	46,55
Cyprus	3,10	6,40	47,00	22,00	27,00	33,00	27,33	37,93	46,55	56,90	47,13
Pakistan	0,90	12,60	45,70	42,00	8,00	35,00	28,33	72,41	13,79	60,34	48,85
Zimbabwe	3,60	7,10	37,30	19,00	24,00	45,00	29,33	32,76	41,38	77,59	50,57
United States	4,70	6,20	37,20	14,00	28,00	46,00	29,33	24,14	48,28	79,31	50,57
Kuwait	2,60	10,70	27,20	24,00	10,00	56,00	30,00	41,38	17,24	96,55	51,72
Kazakhstan	1,80	3,40	53,90	31,00	41,00	23,00	31,67	53,45	70,69	39,66	54,60
Germany	2,40	3,50	47,70	28,00	40,00	29,00	32,33	48,28	68,97	50,00	55,75
Georgia	0,20	6,60	59,10	57,00	26,00	15,00	32,67	98,28	44,83	25,86	56,32
Romania	1,30	9,20	34,80	36,00	13,00	49,00	32,67	62,07	22,41	84,48	56,32
Palestinian Territories	1,50	5,10	46,80	34,00	34,00	34,00	34,00	58,62	58,62	58,62	58,62
Turkey	1,00	3,60	48,00	40,00	39,00	28,00	35,67	68,97	67,24	48,28	61,49
Rwanda	3,70	5,50	22,10	18,00	31,00	58,00	35,67	31,03	53,45	100,00	61,49
Morocco	0,50	3,20	53,20	49,00	42,00	24,00	38,33	84,48	72,41	41,38	66,09
Slovenia	1,90	2,20	44,50	30,00	49,00	36,00	38,33	51,72	84,48	62,07	66,09
Spain	0,30	8,50	35,20	55,00	16,00	48,00	39,67	94,83	27,59	82,76	68,39
China	0,50	0,60	56,60	48,00	57,00	19,00	41,33	82,76	98,28	32,76	71,26
Iraq	0,80	3,00	43,00	44,00	44,00	37,00	41,67	75,86	75,86	63,79	71,84
Estonia	0,70	2,00	47,70	45,00	51,00	31,00	42,33	77,59	87,93	53,45	72,99
Belarus	0,30	1,10	56,20	53,00	55,00	20,00	42,67	91,38	94,83	34,48	73,56
Russia	0,40	1,80	50,20	51,00	52,00	26,00	43,00	87,93	89,66	44,83	74,14
Netherlands	1,00	1,50	40,90	39,00	53,00	39,00	43,67	67,24	91,38	67,24	75,29
Ukraine	0,30	2,80	47,70	56,00	46,00	30,00	44,00	96,55	79,31	51,72	75,86
Algeria	0,90	3,90	31,20	41,00	38,00	53,00	44,00	70,69	65,52	91,38	75,86

Poland	1,60	0,90	37,60	33,00	56,00	44,00	44,33	56,90	96,55	75,86	76,44
Armenia	0,50	2,40	40,10	47,00	48,00	40,00	45,00	81,03	82,76	68,97	77,59
Jordan	0,70	2,80	35,80	46,00	45,00	47,00	46,00	79,31	77,59	81,03	79,31
Azerbaijan	0,30	5,20	31,10	52,00	33,00	54,00	46,33	89,66	56,90	93,10	79,89
Yemen	0,90	2,40	33,00	43,00	47,00	51,00	47,00	74,14	81,03	87,93	81,03
Japan	1,00	0,30	22,70	38,00	58,00	57,00	51,00	65,52	100,00	98,28	87,93
Tunisia	0,20	2,10	32,00	58,00	50,00	52,00	53,33	100,00	86,21	89,66	91,95
Egypt	0,30	1,20	30,50	54,00	54,00	55,00	54,33	93,10	93,10	94,83	93,68

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