



# PHD THESIS

Why does mainstream economics ignore ecology?

## SUBJECT

This PhD thesis is an inquiry about:

- (a) Why does the mainstream (neoclassical) theory of economics ignore ecology?
- (b) What is the place of ecology in the undergraduate level education in economics?  
Case in three European countries (UK, Germany and Switzerland)



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## PhD Thesis: Why does mainstream economics ignore ecology?

Official PhD topic: The place of ecology in undergraduate economics education; the case in three European countries (La place de l'écologie dans l'enseignement de premier cycle en Science Economique: le cas de trois pays européens) - Ecole Doctorale, Università di Corsica

In my own words:

(a) Why does the mainstream (neoclassical) theory of economics ignore ecology?  
(b) What is the place of ecology in the undergraduate level education in economics, in three European countries? (UK, Germany and Switzerland)

(a) is the more philosophical part of my PhD that requires qualitative and historical analysis. (b) is the more empirical part which is based at least partially on some surveys and fact tables. I haven't done any surveys myself; I did only unstructured and structured interviews at the beginning of my PhD work. This thesis includes information about existing survey reports, plus, content and keyword analysis of some popular economics textbooks. However, part (a) represents the primary inquiry of this thesis: Why does neoclassical economics ignore ecology? What are the historical, ideological, political and economic reasons of this ignorance? What are the most important barriers to overcome this ignorance?

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*Downloadable PhD documents (pdf files):*

1. [Description of PhD Project \(in French\)](#)
2. [Description of PhD Project \(English translation\)](#)
3. [First Poster Presentation \(June 2019 in Corte\)](#)
4. [2nd Progress Report \(May 2019\)](#)
5. [3rd Progress Report \(August 2019\)](#)
6. [4th Progress Report \(February 2020\)](#)
7. [5th Progress Report \(September 2020\)](#)
8. [Second Poster Presentation \(September 2020\)](#)

*About my language and writing style:*

I try to explain all ideas and concepts with a readable, clear and understandable language. I refrain from using hardly understandable field-specific and esoteric jargon (without definition and explanation wherever necessary), or premature mathematics and statistics in order to create a superficial impression of "respectable science". I think, this attitude is especially important for multi-disciplinary studies like my PhD which covers fields like ecology, philosophy, economy, history, sociology and anthropology. In the "Conclusions" of this thesis, I present also other reasons why the language of economics should be understandable by everyone.

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## A. INTRODUCTION

### A.1. Important activities and publications since beginning of my PhD in December 2018

1) Paper: Misconceptions of Neoclassical Economics and Their Possible Causes (October 2020)

[https://www.mediafire.com/file/1gf0tpi89bmvc7/Misconceptions\\_of\\_Neoclassical\\_Economics\\_and\\_Their\\_Possible\\_Causes\\_20201010.pdf/file](https://www.mediafire.com/file/1gf0tpi89bmvc7/Misconceptions_of_Neoclassical_Economics_and_Their_Possible_Causes_20201010.pdf/file)

I submitted this article to "International Journal of Pluralism and Economics Education" edited by Dr Jack Reardon in October 2020. Having passed the initial screening process with a very positive feedback, this article is now in the routine review process. I hope, it will be published soon.

This article is important because it summarizes the main findings of my PhD in a structured way (see table-1 on page 7).

I talked about this article at the "International Symposium on Economic Thought" (www.repect.org, 28-30 November 2020):

<https://www.youtube.com/watch?v=NEh-FsM5ncI>

2) My symposium article: What is economics and what is it for? (www.repect.org, Virtual International Symposium on Economic Thought, 28-30 November 2020)

[https://www.mediafire.com/file/i4vd105328h3v56/WhatIsEconomicsAndWhatIsItFor\\_20201107.pdf/file](https://www.mediafire.com/file/i4vd105328h3v56/WhatIsEconomicsAndWhatIsItFor_20201107.pdf/file)

This article is also important, because it is an introductory article for my PhD work, explaining how "political economy" of the 19. century has become first "neoclassical economics", and then "neoliberal economics" in the 20. century.

I also talked about this article at the symposium:

[https://www.youtube.com/watch?v=vRs3r\\_uYVCg](https://www.youtube.com/watch?v=vRs3r_uYVCg)

3) Presentation with a discussion session at the University of Akdeniz in Antalya-Turkey on the 14. November, 2019: Rethinking Economics (→ [presentation slides](#))

4) I attended another seminary about *Rethinking Economics* in Bern organized by WWF Switzerland, on the 25. September 2019. There was an interesting workshop about the *power of words* in economic teaching (→ [my comments twitter@tuncalik](#), → [www.aufzuneuenuefern.org/](http://www.aufzuneuenuefern.org/))

5) Presentation at WWF workshop in Bern-Switzerland: Rethinking Economics (July 2019)

YouTube video: Rethinking Economics workshop organized by WWF (4. July 2019, Bern)

<https://www.youtube.com/watch?v=L6JepCiCSH0>

6) Unstructured and semi-structured interviews with several academicians of economics in Turkey and in Switzerland (from December 2018 to February 2019). See [2nd Progress Report \(May 2019\)](#) for more information.

### A.2. Acknowledgements

I owe many thanks to these persons who have contributed to this thesis with their inputs, critics, comments or suggestions: Dr Mine Kara (Bilkent University), Prof Peter Söderbaum (Mälardalen University), Prof Richard Norgaard (University of California, Berkeley), François Casabianca (INRA Corse), Prof Altuğ Yalçıntaş (Ankara University), Dr Julien-Francois Gerber (International Institute of Social Studies), Dr Başak Karşıyakalı (Dokuz Eylül University), Dr Gül İpek Tunç (Middle East Technical University), Prof Armin Schmutzler (University of Zurich), Dr Suzann-Viola Renninger (University of Zurich), Uğur Tanrıverdi (software engineer), WWF Switzerland, Florian Rommel

(Cusanus Hochschule), Jasmin Rippstein (University of Zurich, Dekanat), Murad Tiryakioğlu (Afyon Kocatepe University)

### A.3. Information Sources and Methods

With my master degree in electrical engineering, with my keen interest in wildlife, evolution, animal behaviour and human history since childhood, and with my many years of hands-on experience in aquarium keeping, I already had a strong background in disciplines like mathematics, physics, linear and nonlinear dynamic systems and ecology as I started to study economics in 2002.

With this broad background, I became aware of many misconceptions like premature mathematisation, inverse fitting and technological optimism quite early, as I began to study conventional economics. I didn't know then, what I was learning was called neoclassical economics. I didn't know much about the history of economic thought either, except for superficial information about famous names like Adam Smith and Karl Marx.

I probably owe my over-average ecological literacy to my many years of experience with aquariums. I needed almost 15 years to make the transition from conventional aquariums (high-tech, industrial, based on artificial intelligence of a factory) to natural aquariums (low-tech, ecological, based on organic intelligence of an ecosystem). I needed 15 years to overcome the mechanistic-reductionist and technology-optimist mentality of my conventional industrial education. I learned most of the principles of ecology (as I outlined in "conclusions") from aquariums; especially the principles related with unexpected long-term consequences of allegedly advanced, new technologies.

I owe a portion of my ecological literacy to my extensive but not very intensive practice in permaculture gardening (i.e. ecological gardening based on harmonious polycultures of preferably perennial plants). Especially the 4<sup>th</sup> and 5<sup>th</sup> principles of ecology (i.e. balanced ecosystem, ecological diversity) that I mentioned below are closely related with ecological gardening.

The rest of the knowledge required for this thesis comes from literature and media research: History of economic thought, critical opinions about mainstream (neoclassical) economics, history of human civilisations, philosophy and history of science, evolution of mechanistic and reductionist worldview during the industrial revolution (i.e. transition from organic world to machine world paradigm), and so on.

Content and keyword analysis of some popular economics textbooks (i.e. principles, microeconomics, macroeconomics) was a part of the literature research (see results in Appendix).

I had unstructured and semi-structured interviews with several academicians of economics at the beginning of my PhD, hoping that I would get valuable information about the current status of economics education. But soon, I realized that there were already some comprehensive survey results and reports like the "The Econocracy" (UK) or "EconPLUS" (Germany) that were much more useful to understand the current status of economics education. Nevertheless, these interviews helped me a lot to formulate new ideas, and find proper reports and literature.

Logical analysis of misconceptions and barriers was a significant part of the work. As shown in Table-1, I tried to link neoclassical misconceptions to their underlying barriers and ecological illiteracy types logically.

### A.4. Back to basics: What is economics, and what is it for?

Before "economics" there was "political economy". All classical economic thinkers like Adam Smith, D. Ricardo, J. Stuart Mills and K. Marx used the term "political economy" for their studies.

Let's see, how **political economy** is defined in [investopedia \(Kenton, 2019\)](#):

"Political economy is an interdisciplinary branch of the social sciences that focuses on the



interrelationships among individuals, governments, and public policy. Those who study political economy seek to understand how history, culture, and customs impact an economic system. Global political economy studies how political forces shape global economic interactions, and how economic theories such as capitalism or communism play out in the real world.”

The term **economics** was coined by the Scottish historian Thomas Carlyle in 1849, and popularized by the pioneers of neoclassical economics like Alfred Marshall at the beginning of the 20<sup>th</sup> century. They began to use “economics” as a synonym for “economic science”.

You may ask, what is then the difference between political economy and economics? Are they simply two different terms for the same thing?

No, considering their scope and content, there are some important differences between political economy and economics. Compared to economics, political economy has a much broader view to economy including social and political realities of life, like economic history, power relations, alienation (from work, product, society, nature), imperialism and exploitation.

Political economy is more about qualitative analysis and verbal explanation like history, whereas quantitative analysis and statistics became quite prevalent in economics.

How did **mathematics**, or in Schumacher’s terms “premature mathematisation” (Schumacher, 1973) become so dominant in economics?

Aside from business interests that preferred to ignore nonmonetary reproduction (i.e. production and recycling) of nature & society as well as nonmonetary costs (i.e. externalities), four features of neoclassical economics played key roles for the **premature mathematisation** of economics:

1. The domination of human-centred, mechanistic and reductionist worldview since industrial revolution (Merchant, 1990; Kütükçüoğlu, 2019, August 1)
2. The fallacious “utility-optimizing, independent (individualistic) rational consumer” assumption (Homo economics)
3. Reduction of wealth and value to exchange value only (i.e. market value or money) ignoring the distinction between use value and exchange value
4. Physics envy; founders of neoclassical economics (e.g. Jevons, Walras, Menger) believed that in order to be a real respectable science, economics must become a mathematical science like Newton physics.

The **rational consumer** assumption was very convenient for mathematisation because it made elegant abstract formulations like “wealth Pareto-optimising market equilibrium” theories possible. The only problem with this assumption was, it was wrong; as modern science shows today, human behaviour is neither rational (in neoclassical sense) nor independent from the social and ecological environment.

The “rational consumer” assumption was constructed on the belief that we call “consumerism” today; human well-being can be improved indefinitely by proper combinations and amounts of market goods and services. Founders of neoclassical economics envisaged humans as “rational utility-maximizing consumers” whose well-being increased continuously as they spent more and more money. Associating well-being directly with money meant underestimating non-monetary and qualitative (social & ecological) factors of well-being as a cognitive side-effect.

Discussions about **use value** (real wealth) and **exchange value** (market value, price) was always a hot topic in the history of economic thought.

For the classical economic thinkers like Smith, Ricardo, Mill and Marx, it was very important to understand the source of real material wealth (i.e. use value of materials). That’s why, they were very careful about differentiating use value from exchange value. They were quite aware of the fact that an

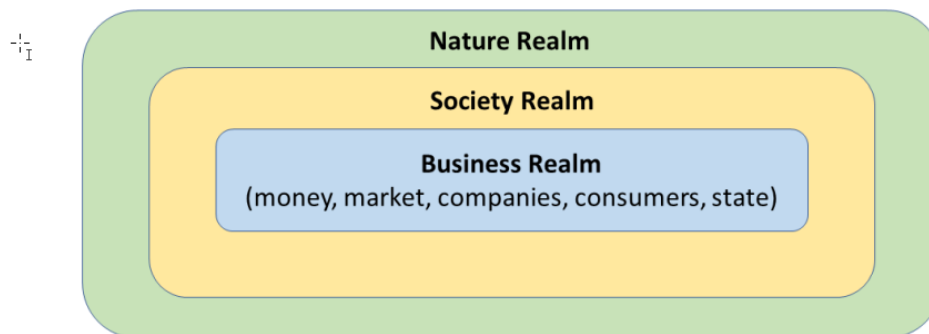
abundant material resource like water, soil or air, that we find in nature for free, may have great use value even if it had no exchange value (i.e. market value) at all (Mazzucato, 2018).

The distinction between use value and exchange value was dropped with the advent of neoclassical economics. Neoclassical economists cared only about exchange value (i.e. price in the market). That is, they equated wealth to money (consciously or not), just like they equated wellbeing to economic growth (consciously or not). This kind of **monetary reductionism** had the consequence that, all the things that we find in nature for free were considered as free (valueless) gift, because value (as well as wealth) meant only exchange value for neoclassical economists. (Foster, Clark, York, 2010)

In “Small is Beautiful” (1973), on page 14, Schumacher wrote: “The illusion of unlimited power, nourished by astonishing scientific and technological achievements, has produced the concurrent illusion of having solved the problem of production. The latter illusion is based on the failure to distinguish between income and capital where this distinction matters most. Every economist or businessman is familiar with the distinction, and applies it conscientiously and with considerable subtlety to all economic affairs – except where it really matters – namely, the irreplaceable capital which man had not made, but simply found, and without which he can do nothing. ... One reason for overlooking this vital fact is that we are estranged from reality and inclined to treat as **valueless** everything that we have not made ourselves.”

Monetary reductionism had many serious consequences. One of them was reducing the whole economy to **business realm** ignoring society and nature: households, firms, state, money, market, and that's all.

**Figure-1** Realms of economic life



Because economy was reduced to business realm, economics has largely become, as Thorstein Veblen said, a **business ideology** which is often used for the legitimization of exploitative earnings (i.e. privatisation of profits, socialisation of costs). Promotion of dirty mining, dirty industry or industrial agriculture with huge social costs as “economic development and growth, modernisation, job creation and technological progress” is a typical example.

65+ student associations from 30+ countries stated in their [Open Letter](#) (ISIPE, 2014), “It is not only the world economy that is in crisis. The teaching of economics is in crisis too, and this crisis has consequences far beyond the university walls.”

Is the mainstream theory of economics taught at most economy departments a *real science* in the service of the whole humanity including future generations, or a mere *business ideology in the cloak* of science, that serve to the narrow interests of a privileged minority (i.e. business people, investors and their stakeholders)?

Conventional economics wants us believe, “if an individual or a company is earning money in legal ways, it must be producing something useful for the society, and creating new jobs”. (Kütükcüoğlu, 2020, July 23)



This claim ignores many legal ways of earning money with huge hidden (social & ecological) costs to society, like dirty mining/industry/energy projects, or industrial agriculture based on ecologically unsustainable mechanistic monocultures (e.g. corn, soja, wheat, cotton) that are artificially maintained with poisonous chemicals (i.e. fertilizers and pesticides).

This is a myth, much inspired by the **invisible hand** argument of Adam Smith, that ignores invisible social and ecological costs (negative externalities) to today's societies and future generations.

This is probably the most central, most popular, and for the short-term financial interests most useful myth that boils down to: "Every medium is right for earning money and power, provided that it has a legal and ideological cloak."

Business interests have today sufficient power over politics and governments to legalize (or criminalize) almost everything they want. Criminalizing organic seeds to enforce GM seeds in many countries through government intervention is a typical example. Industrial agriculture with harmful agrochemicals was often imposed by global organisations like World Bank and World Trade Organisation in the name of "Green Revolution", technological progress, modernisation, economic development and growth, efficiency improvement and job creation. (Shiva, 2016)

In most universities, students learn economics together with its twin department "business administration". Thus, monetary economics (i.e. business realm) is strongly represented but nonmonetary economics (i.e. ecology and anthropology) is totally missing. In some economics departments you can even find offices of neoliberal foundations and powerful investment groups. Have you ever seen an office for ecological or anthropological literacy in an economics department?

Hence, economics as thought today seems more like chrematistics (art of making money) than the "study of economy":

**Chrematistics:** The art of making money, often at all costs to nature and humanity (money justifies everything!)

**Economy** (oikos+nomia): Household or living space (Lebensraum) management; management of livelihood and sustenance (Shiva, 2019).

Whereas chrematistics is about the management of money, economy is about the management of sustenance. Sustenance is not only about monetary goods & services one can buy at the market; sustenance is also about nonmonetary goods & services provided by nature and society for free. In fact, most essential and vital things like clean air, clean water, mild climate, fertile soils, marine and forest products are reproduced by the nature; nature is the primary reproducer. Without the primary reproducer we humans cannot even live, let alone producing anything to drive the economy.

Because conventional economics reduced economy to business realm (households, firms, money, market, state), it has become more chrematistics than the study of economy.

Let's see, how economics is usually defined:

*Economics:* A social science that deals with the production, distribution, consumption of goods and services.

**Recycling** is missing, and the designation of "social science" is an unnecessary limitation that exclude natural sciences like biology, chemistry and physics. A much better definition would look like as follows:

*Economics:* An evolutionary and holistic (social & ecological) human science that deals with human needs along with the reproduction (i.e. production and recycling), distribution and consumption of

goods and services to satisfy human needs. Note: Nature (i.e. living ecosystems like oceans, forests, lakes and rivers) is the primary producer and recycler.

Here is another common definition of economics:

*Economics*: Study of how society uses its limited (scarce) resources.

History tells us, seemingly unlimited resources like clean air, clean water or fertile soils may easily become limited within time, and vice versa. Luxuries of the past may become normalities of today, and vice versa. For example, assets like winter and summer residence sites, stimulating natural and social environment and healthy organic food enjoyed by many traditional societies are luxuries today for the majority of city dwellers. Hence, economics must consider all kinds of resources; limited and non-limited, living and non-living, considering complex (social & ecological) relationships and cycles with a long-term view into the past and future.

This definition of economics with focus on scarce resources is misleading because it might give students (especially to students without sufficient ecological literacy) the impression that there are two fixed categories of resources in life (scarce and abundant) with rigid and impermeable boundaries; a scarce resource remains always scarce; an abundant resource remains always abundant.

In reality, the coverage of these categories may change dynamically within time, depending on many social and economic factors. For example, depending on economic policies (e.g. growth or degrowth economy), clean drinking water may remain (or become) an abundant free good provided by nature (i.e. produced and distributed by nature), or a scarce monetary good provided by companies like Nestle (i.e. produced by nature, controlled and distributed by Nestle).

Imagine a settlement policy that supports sustainable and self-sufficient villages with ecological gardening (e.g. permaculture) as the central concept. Such a policy would shift fresh fruits and vegetables from monetary to nonmonetary realm.

There is another trap in associating economics with scarce goods only. Scarce goods are usually monetary goods that can be controlled and distributed by corporations. Creating artificial scarcity either by ecosystem mutilation (Kütükçüoğlu, 2019, May 5) or by social engineering (e.g. advertisement industry and mainstream media that create artificial needs) is one of the most common ways of transforming nonmonetary goods into monetary goods. Hence, focusing on scarce goods means, in a way, limiting the scope of economics to monetary goods only (i.e. business realm).

Therefore, a much better definition of economics would look like as follows:

*Economics*: Study of how society uses its (limited and unlimited) resources.

Having clarified what economics should study, the next question is:

What is economics for? Why should we study economics? What is the ultimate purpose of economic policies?

I know, many mainstream economists claim, economics is not about political and ethical issues. They say, economics is not a normative science; it is just an objective and analytical science like physics that provide us with mental tools to formulate the policies to we want. What policies and outcomes we want should be determined by ethics and politics; not by economics.

Like many critical-minded students of economics, I don't agree with this claim.

Economics is not a science which is free of ideology or politics as it often pretends to be. As an example, it promotes "economic growth" as the ultimate measure and purpose, and striving for economic growth has many serious political and ethical consequences (Hickel, 2020) like:

- Increasing monetary production at the cost of social and environmental destruction; i.e. increasing monetary production at the cost of massively destroying nonmonetary reproduction
- Stealing wealth from local communities and future generations to make a handful of powerful investors and their stakeholders extremely rich
- Overshooting physical and ecological planetary limits; stealing life from future generations
- Driving the whole economy 180 degrees away from a more equitable distribution of wealth; accumulating wealth into the hands of a powerful minority

Politics, ethics and economics cannot be separated. Economics students must be aware of the political and ethical consequences of economic policies. Highest goals of economics openly must be discussed and stated. Otherwise, they will be hijacked by narrow business interests with misleading proxies like economic growth (Raworth, 2017).

### **A.5. What is ecological literacy and how is it acquired?**

Ecological literacy: Understanding the organisational and functional principles of ecological communities (i.e. ecosystems including humans), and using these principles for creating and maintaining sustainable human communities (Graham, 2018; → [What is Ecoliteracy?](#)).

Here is another definition of ecological literacy:

“Being ecoliterate means understanding the basic principles of ecology and the principles of sustainability, and living accordingly” (Capra & Luisi, 2014; “The Systems View of Life”, page 353).

Ecological literacy requires both theoretical knowledge and practical real-life experience; i.e. observing wildlife and sustainable communities, hands-on experience with ecological gardens, natural garden ponds, natural (low-technology and low-maintenance) aquariums, and so on. Theoretical knowledge alone is not sufficient for deep ecological literacy.

Required theory: Principles of ecology, principles of ecosystems and sustainability, evolutionary (social & biological) history of human societies; i.e. evolutionary anthropology, also including modern societies.

Evolutionary anthropology is necessary to understand the needs of human societies for sustainable well-being, and how these needs may depend on factors like culture, values, climate, environment, time and individual preferences. Understanding the fact that every society can have different values and goals, and accordingly different notions of “good life” is an essential part of pluralist and polycultural thinking.

Evolutionary anthropology is also necessary to understand what makes a society sustainable or unsustainable.

“Free market” (mainly price and product information) does not provide “consumers” with proper information because the social and environmental costs of production, as well as recycling of waste, are not part of current economic models (i.e. externalities are handled very crudely as exceptional cases).

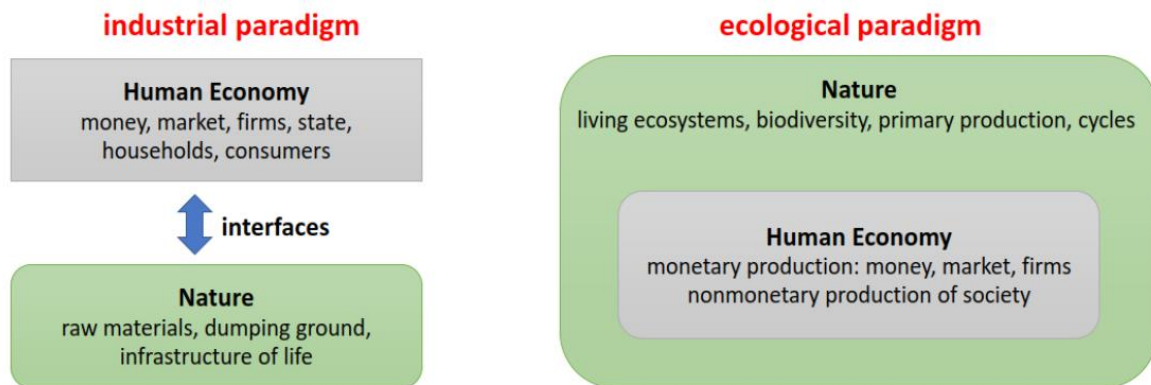
“Corporate economists treat not only the air, water and soil as free commodities [and in most cases as limitless, mechanistic and indestructible resources] but also the delicate web of social relations, which is severely affected by continuing economic expansion.” Private profits are made at the cost of deterioration of the environment and life quality of the big majority, and at the expense of future generations. “The marketplace simply gives us wrong information. There is a lack of feedback [e.g. what happens before, during and after production of goods], and the basic ecological literacy tells us that such a system is not sustainable.” (Capra & Luisi, 2014; page 354)

## A.6. Principles of ecology (in the deep and broad sense)

What does ecology tell us in the context of sustainable economy?

- 1) Everything is **interconnected** in a living ecosystem (web of life); while the success of the whole community (ecosystem, organism) depends on the success of its individual members, the success (survival and health) depends on the community as a whole.
- 2) Complex **network of relationships** is the basic pattern of life. These complex relationships are in most cases nonlinear, and they involve multiple feedback loops for dynamic stability and resilience.
- 3) Most ecological processes are **cyclical**; not linear. This is a major clash between ecology and economics because most industrial systems are linear. “Sustainable patterns of production and consumption need to be cyclical, imitating the cyclical processes in nature” (Capra & Luisi, 2014; page 354).
- 4) Nature is the primary producer and recycler (i.e. **primary reproducer**); human economy is only a part of the big picture (nature) with complex relationships to nature. These complex relationships cannot be represented with crude and mechanistic interfaces.

**Figure-2** Industrial Paradigm versus Ecological Paradigm



- 5) Societies can have very **different values**, goals and lifestyles. There is not a single lifestyle (or living standard) that is better, higher or more progressive than all other lifestyles as the Western ideology of progress claims (cultural centralism or racism).
- 6) Ultimate goal of economic policies: **sustainable well-being** for all, including future generations; i.e. not economic development or growth in the neoclassical sense.
- 7) **balanced ecosystem**: the more complete and the more balanced an ecosystem (e.g. forest, farm, lake, aquarium) is in terms of its bio-diversity and biochemical cycles, the less human intervention and technology it will require for its sustenance, and vice versa; more maintenance and technology is required for incomplete, unbalanced or mutilated ecosystems, like monocultures in agriculture.
- 8) The complex function of continuously co-evolving **biological diversity** (i.e. distributed organic intelligence) can't be replaced or compensated by non-living mechanistic human technologies (i.e. centralized mechanistic intelligence) on a sustainable basis.
- 9) Human well-being depends on many **qualitative aspects of life** (social and ecological). Some human needs are universal, some needs are determined by factors like culture, individual, time and geography.
- 10) Everything is connected in an ecosystem; **externalities** (i.e. side-effects of economic activities) can have wide-reaching effects in terms of location and time. Sometimes, small but continuous influences can be accumulated and amplified in the ecosystem to cause big consequences. New and

allegedly advanced technologies can also have unexpected wide-reaching long-term consequences (e.g. the tragedy of DDT as narrated in “Silent Spring” by Rachel Carson).

11) Nature is complex, nonlinear, and in many cases unpredictable. Nature has a large capacity for regeneration and healing, but some damages like extinction of key species can be irreversible. Understanding and applying the **precautionary principle** is important to avoid potentially catastrophic risks.

12) **social individuals**: Ideals, values, preferences and behaviours of individuals are largely shaped by the social and biological environment in which they live. So, the behaviour and preferences of an individual cannot be isolated from the individual’s social and biological environment.

### **A.7. Why should ecology and anthropology be at the center of economics education?**

In my opinion, the ultimate goal of all economic policies should be “sustainable well-being for all” including future generations. All established terms and measures like “economic development” and “economic growth” must be critically questioned. Development –a much misused term that was hijacked from biology (e.g. development of an embryo)– must be redefined like the whole theory and education of economics. (Shiva, 2014)

If sustainable wellbeing is the ultimate purpose, what is the purpose of economics education?

What should economics students learn as the fundamental background? The required body of knowledge can be derived from the typical inquiries for sustainable well-being:

- What are the most basic needs of people? Which basic needs depend on culture or environment, which needs are universal?
- How do (and did) people live considering different cultures and environmental conditions? What kind of cultures and lifestyles are there? How did these cultures and lifestyles evolve?
- What makes a lifestyle sustainable or unsustainable?
- What makes people happy or unhappy? What kind of policies are required for the happiness of the majority?
- What kind of technologies serve to the wellbeing of the majority? What kind of technologies serve only to the interests of a minority? What makes a technology sustainable or unsustainable?

Looking at these inquiries, I come to the conclusion, that evolutionary (cultural & biological) **anthropology**, also covering modern societies, should be at the centre of economics education. As Veblen said, economics should be an evolutionary human science.

### **A.8. Does mainstream economics really ignore ecology?**

Yes, definitely. You may check:

- Mainstream (neoclassical) textbooks for undergraduate students (like Principles of Economics by G. Mankiw)
- Lecture plans for economy students at universities, content of these lectures
- Mission statements of economy departments (main goals and priorities)
- Job market: Primary requirements on economists (and selection criteria)
- General school education and media that shape public opinion (industrial paradigm)
- The scope and content of mainstream economic journals
- Economy content of mainstream media (only business realm, technology and money)

As an illustration, following words don’t exist in “Principle of Economics” by G. Mankiw (7<sup>th</sup> Edition, 850+ pages), one of the most popular undergraduate textbooks:

Ecology, ecosystem, biodiversity, symbiosis, anthropology, coevolution, adaptation, Georgescu, entropy, thermodynamics, Daly, complexity (in the sense of unpredictable, nonlinear complex systems), emergent, Schumacher, Rachel Carson, DDT, (soil) fertility, humus, Veblen, Marx, primary producer

In electrical engineering, undergraduates study physics because physics is justly supposed to be a fundamental discipline to understand electricity and engineering.

Now imagine an ostensibly “scientific study of economy” which finds it unnecessary to study human sciences (e.g. evolutionary anthropology, psychology, sociology) to understand human needs, and which finds it unnecessary to study natural sciences (e.g. biology, ecology, physics) to understand the primary reproduction of nature (e.g. clean water, clean air, stable atmosphere and climate, fertile soils, marine and forest products, medicinal plants), even though economy is mainly about reproduction and distribution to satisfy human needs. Isn’t it surprising? How is it possible?

This is very much like a faculty of agriculture which finds it unnecessary to study the ecology of soil.

Let’s recheck the definition of economics: Economics is “scientific study of economy” which is concerned with the reproduction (production and recycling), distribution, and consumption of goods and services. It studies how individuals, organizations, governments, and nations make choices on allocating resources to satisfy their wants and needs.

Isn’t Satish Kumar (one of the founders of the Schumacher College) right to ask to a professor of the prestigious (!) London School of Economics (LSE), “How can it be that you don’t have an ecology department? How can you teach economy without ecology?” (Kumar, 2013; → [video: Education with Hands, Hearts and Heads](#) – TEDx Talks)

I checked the study programs and courses of LSE (→ LSE: [programs and courses](#)) and found nothing when I searched with “ecology” or “biology” as the keyword (as of 23. November 2020). As for “anthropology”, there are some lectures only for social anthropology, and the question is, what percentage of the economics students take these lectures.

## B. FUNDAMENTALS: BACKGROUND INFORMATION

### B.1. Persistent belief in the Western idea of linear and continuous progress

Historian, moralist and social critic Cristopher Lasch (1932-1994) wrote in his book named "The True and Only Heaven: progress and its critics" (1991):

Lasch: “How does it happen that serious people continue to **believe in progress**, in the face of massive evidence that might have been expected to refute the idea of progress once and for all?”

Lasch: “The assumption that our standard of living (in the broadest meaning of the term) will undergo a steady improvement colours our view of the past as well as our view of the future.” (Lasch, 1991)

Modern conception of progress (since industrial revolution) is the promise of steady improvement with no foreseeable ending at all. (Lasch C, 1991)

**Standard of living**, though considered an objective and scientific measure in mainstream economics, is also a Western notion, which assumes, the only decent and good lifestyle (i.e. the real civilization) can be the Western lifestyle, which is in our modern times equated to the industrial urban lifestyle (sociologists like Marcus Wissen und Ulrich Brand call it imperial lifestyle) based on neoliberal



values like individualism and consumerism. Within this worldview, individual freedom is often equated to *individual choice* in the context of market, as if all the material needs, that we need for a good life, could be purchased from the market.

Vandana Shiva claims, **consumerism** is one of the primary causes of the destruction of local cultures along with sustainable lifestyles and economies: "... economic consumerism hijacked culture, reducing it to a consumerist monoculture of McDonald and Coca-Cola on the one hand, and negative identities of hate (like religious extremism) on the other." (Shiva, 2005, page 101; → "Earth Democracy")

Where does this belief in continuous progress come from? How did this unidirectional sense of history originate? Most ancient societies had a cyclical sense of history: Birth (foundation), development, maturity, degradation and death (collapse) like the life cycle of an organism or ecosystem.

The **mainstream history of humanity** that is taught in most modern schools is a linear history of progress:

"The earliest humans, namely hunter-gatherers, were primitive savages; they lived like animals without the protective morality and laws of a civilization. Accordingly, their lives were "solitary, poor, nasty, brutish, and short" (Thomes Hobbes, 1558-1679). Only with the foundation of first agricultural states in places like Mesopotamia, Egypt and China, humans could begin to live as civilized individuals with material prosperity and comfort, moral laws, religions and traditions. After enlightenment, foundation of modern (positivist) science, industrial revolution (i.e. fossil fuel revolution) and further technological progress, the human condition improved even better. There seems to be no physical limits to this improvement (i.e. material prosperity, standards of living etc.) due to continuous progress in science and technology, which can find a solution for every kind of social and ecological problem, and a substitute to every kind of natural resource including energy sources and minerals (i.e. *technological fundamentalism* due to unlimited trust in science and wishful thinking)."

The primary reasons (i.e. ideological pillars) of the belief in progress can be summarized as follows:

- **Missing or distorted knowledge of human history** (i.e. evolutionary anthropology). For example, modern anthropology tells us that hunter-gatherers generally lived better and healthier than the majority of people living in agricultural states. (→ [Worst Mistake in the History of the Human Race](#) by Jared Diamond, *Against the Grain* (2017) by James C. Scott, *Against the Grain* (2004) by R. Manning).
- The **assumptions of classical liberalism** like (a) the sense of fair competition in the market and the feeling of responsibility for the family and nation will discipline the wild desires and instincts of individuals such as limitless greed for money and luxury, and (b) the pursuit of continuous economic development (luxuries of past becoming norms and needs of today etc.) will not corrupt the society, on the contrary; it will discipline the society, and serve as a sense of direction and purpose.
- **Too much trust in science and technology**, generalizing the superficial successes of the technological progress in the 18<sup>th</sup> and 19<sup>th</sup> centuries for the limitless future. Confusing the new possibilities offered by fossil fuels with human ingenuity (like confusing fossil fuel revolution with industrial and technological revolution) was another factor. Though science progressed significantly in fields like physics, astronomy and chemistry (i.e. science of non-living nature), it remained quite backward in understanding the dynamics and evolution of living complex ecosystems like forests, rivers and lakes with multiple species. The term "ecology" was coined in 1866 by the biologist Ernst Haeckel from the Greek word "oikos" meaning household (which is

also the root of economy) but the movement of ecological and environment enlightenment began much later in 1960s, with pioneers like Rachel Carson (author of “Silent Spring”).

- **Ignoring the global influence of military and industrial imperialism**; looking to the world from the narrow perspective of West Europe and USA (i.e. Western perspective) which obscured the wide-reaching effects of Western military and economic imperialism, colonialism and exploitation from the perception of an average citizen of a Western country. Every economic development that added to the wealth of a Western nation was perceived as progress, even if this development had detrimental effects in other “2<sup>nd</sup> class nations” of the world. For example, the textile industry in UK which developed at the expense of prosperity (incl. textile and agriculture industries) in India. This imperialistic and narrow perspective was further exacerbated by Western “white man racism” and ecological ignorance (i.e. not being aware of the global socio-ecological consequences of destructive economic activities).
- **Technological fundamentalism** (naïve technological optimism); with Vandana Shiva’s words, “the unshakeable belief that technological progress can solve every social and ecological problem in the world.” Promoting an unsustainable way of monocultural agriculture with chemical fertilizers and pesticides as Green Revolution is a typical example of technological fundamentalism.
- **Ignorance of social and ecological limits** to ever increasing production and consumption; the empty and limitless world paradigm (terra nullius) fed by disrespect for other nations and other races of people (i.e. racism) and nature (i.e. anthropomorphism and mechanistic-reductionist worldview).
- **Equating progress to economic growth** through neoclassical/neoliberal ideology and monetary reductionism. In other words, measuring progress by economic growth (i.e. GDP), a practice, which became quite dominant among politicians and economists after the second world war. It was another factor which obscured the wide-reaching effects of economic exploitation (in terms of geography and time). V. Shiva explains in Earth Democracy how this kind of GDP and money reductionism works: “In the ideology of the market, people are defined as poor if they don’t participate overwhelmingly in the market economy. People who satisfy their needs through self-provisioning mechanisms [i.e. non-monetary production] are perceived as poor and backward.” Many countries like Peru and Punjab (a state of India) were welfare states in the past with a large and prosperous middle class. They are much poorer today, but this fact is obscured by GDP numbers that represent only monetary flow of goods and services.

Unlike ancient civilizations that had a **cyclical sense of history**, which considered “rise and fall of societies” as inevitable cycles of nature (or fate), Christian-Judaist tradition had a notion of unidirectional progress (i.e. civilized and uncivilized societies, a hierarchy of civilization etc.), but this notion of progress was more about moral improvement and social order rather than material wealth.

The leading intellectual of classical liberals, Adam Smith, diverted the meaning of progress to the direction of material wealth, though he was broad-minded enough to have some concerns about moral issues like mental health, happiness and equity. Though often claimed otherwise, he was well aware of the fact that “the invisible hand of the market” alone would not be sufficient alone to guarantee a nation’s prosperity.

Lasch: “The original appeal of the 18<sup>th</sup>-century idea of progress, and its continuing plausibility derived from the assumption that **insatiable appetites** [for consumption, comfort and luxury], formerly condemned as a source of social instability and personal unhappiness, could drive the economic machine (just as man’s insatiable curiosity drove the scientific process) and thus ensure a never-ending expansion of productive forces.” (Lasch, 1991, page 52)

Earlier societies believed that some greedy individuals can become disproportionately rich only at the expense of others. Classical liberals like Smith and Ricardo thought, economic development (i.e. increasing industrial efficiency through improved technologies and specialization) may become the source of richness, without effectively stealing wealth from other individuals of the society.

Political scientist and anthropologist James C. Scott describes the Western idea of progress as an “**ascent of man**” story based on a distorted view of human history: “Historical humankind has been mesmerized by the narrative of progress and civilization as codified by the first agrarian kingdoms. As new and powerful societies, they were determined to distinguish themselves as sharply as possible from the populations from which they sprang and that still beckoned and threatened at their fringes. Agriculture, it held, replaced the savage, wild, primitive, lawless, and violent world of hunter-gatherers and nomads.” (Scott, 2017; → “Against the Grain”)

Scott: “From Thomas Hobbes to John Locke to ... Friedrich Engels to Herbert Spencer to Oswald Spengler to social Darwinist accounts of social evolution in general, the sequence of progress from hunting and gathering to nomadism to agriculture (and from band to village to town to city) was settled doctrine. Such views nearly mimicked Julius Caesar’s evolutionary scheme from households to kindreds to tribes to peoples to the state (a people living under laws) wherein Rome was the apex, with the Celts and then the Germans ranged behind. Though they vary in details, such accounts record the march of civilization conveyed by the most pedagogical routines and **imprinted** on the brains of schoolgirls and schoolboys throughout the world.” (Scott, 2017, page 9)

Scott explains, why modern anthropology and archaeology destroy the faith in continuous progress, as follows: “It turns out that the greater part of what we might call the standard narrative [i.e. narrative of continuous progress] has had to be abandoned once confronted with accumulating archaeological evidence.” (Scott, 2017, page 9)

In his book “Against the Grain”, Richard Manning gives an interesting example of an archaeological evidence which contradicts the mainstream belief that farmers must have lived much better than their contemporary hunter-gatherers: “We know from the remains that the [Cahokia] farmers were smaller [compared to the contemporary hunter-gatherers], the result of general deprivation and abuse. The women, were especially smaller.” (Manning, 2004, page 35)

We know from the history of imperialism and colonialism that arguments like “bringing progress and civilization to backward nations” are often used to justify massive exploitation. Today, the modern version of such racist arguments has become “economic growth and development”, and it is generally preferred to say simply and politely “developing country” rather than using rude designations like savage, primitive, heathen or backward.

Ecological economist Richard B. Norgaard draws attention to the similarities between the Western idea of endless progress and **Social Darwinism** (i.e. fallacious interpretation of the evolution theory):

Norgaard: “The Western idea of progress easily aligns with the idea of the tortoise becoming more and more fit. Social Darwinists (in the late 19<sup>th</sup> century) falsely adopted the idea of the survival of the fittest to justify, under a banner of progress [i.e. becoming better and better], how superior people were outcompeting inferior in the newly emerging corporate industrial economy.” (Norgaard, 2019; → [Economism and the Econocene](#))

Social Darwinists either misinterpreted or deliberately distorted the meaning of “fittest” in the phrase “survival of the fittest”, which actually means “best adapted to environmental conditions” (i.e. fitting in the sense of a key’s fitting to a keyhole); not best, superior, or fittest in the sense of being fit in sports. In the evolutionary sense, a humble rat can be much fitter than an imposing lion.

Nevertheless, the idea of endless progress resembles **Social Darwinism** in the sense that it claims, there should be a single and well-defined direction independent of all environmental conditions, like the Western-style economic development, which defines the road to endless progress.

Norgaard argues, that the historical development of societies can't be properly described with concepts like progress or decline, because there is not a single best direction which is much better than all other possible directions, even if a society (like Western societies) claims its direction is the real progress, real civilization and so on. Besides, "which direction should be the best one" always depends on the complex social and biological environmental conditions.

That's why, Norgaard claims, the concept of **co-evolution** [in the context of cultural evolution] should be used to describe the historical development of societies, rather than single-dimensional concepts like progress or decline. Every society (like every species) can and should take its own evolutionary pathway depending on its own cultural and biological environment; no single and standard direction of development can be prescribed for all societies of the world.

Norgaard: "... with coevolution, there is no equivalent to the concept of progress. The characteristics of a species [or of a society] simply change in response to each other's changes." (Norgaard, 2019)

Supporting the arguments of Lasch, Norgaard writes: "... the **nature of progress** changed from moral progress during the 17<sup>th</sup> century to include material progress beginning in the latter 18<sup>th</sup> century, to become economic progress during the 20<sup>th</sup> century, and then since 1980 or so to become simply *growing the economy* or GDP growth. Values coevolved with increasingly dominant economic understandings within the knowledge subsystem as well as with the increasingly dominant market organization of the social system. As values became more economic, the criteria of what constitutes progress changed accordingly." (Norgaard, 2019)

Thus, the meaning of progress changed continuously by the process of co-evolution, in response to factors like political power and business interests.

Norgaard thinks, humanity needs a radical transition from the idea of endless material progress to holistic survival and morality:

Norgaard: "The coevolution of economism with the Econocene has led humanity to the brink of disaster. **Faith in progress** has long been a part of the problem. Actions to stave off climate change have been trimmed and delayed on the presumption that countering environmental destruction has the opportunity cost of foregone human wellbeing through further investments in technology that further increase the production or provide novel forms of material goods. And yet studies show that wellbeing increases little, if at all, with further material assets after basic needs are met. Shifting from faith in progress toward a consciousness of holistic survival would be more appropriate given the challenges of climate change." (Norgaard, 2019)

Faith in endless progress is closely related with **faith in endless economic growth** which ignores the boundaries of nature; hence, ecology. In "On Fire" (2019) Naomi Klein writes: "Climate change is a message ... telling us that many of Western culture's most cherished ideas are no longer viable. These are profoundly challenging revelations for all of us raised on Enlightenment ideals of progress, unaccustomed to having our ambitions confined by natural boundaries. And this is true for the statist left as well as the neoliberal right." (Klein N, 2019).

Vandana Shiva explains, how the faith in linear progress serves to the narrow **interests of rich and powerful minority** (1%) against the wellbeing and survival of 99%:

Shiva: "In just 500 years of colonisation, including 200 years of fossil-fuel age and 20 years of corporate globalisation, humanity has done enough damage to earth to ensure its own extinction. The blindness of the 1% to the potential life, to the rights of people, to the destructive impacts of their

constructs, has endured that going over the precipice is inevitable. They define their destructive, colonising power as superior while the creative, nonviolent forces of nature, and of women, indigenous people and farmers, is perceived as *backwardness* or *passivity*. In their constructed narrative of **linear progress**, there is only one way; forward. But when you are already standing at a precipice, going forward means hurtling down” (Shiva, 2019; → “Oneness vs 1%”)

When a society talks about progress, we need to ask “OK, your society is progressing, but progressing into what shape and direction?”

Progression of a society (i.e. cultural evolution) is an evolutionary process, like the evolution of living organisms and ecosystems. And there is not a single **direction** or goal in evolution; every species or society evolves into a different direction.

“Development” in the biological sense, for example development of an embryo to become a baby, is quite different than evolution. Development (a term often misused by mainstream economics) is a much more deterministic and single-minded process than evolution, with a definite goal: Producing a baby, or producing an adult individual...

Coming back to cultural evolution: A society may well believe, its historical evolution is real progress into higher goals or whatever, and this is the single possible, respectable and valid direction of progress, but this is an illusion. Every society has different values and ideals, and accordingly, a different conception of progress.

For example, for a mechanistic-reductionist and Western-minded society, progress in agriculture may mean “as much mechanical automation and human control as possible” (i.e. maximum technology minimum ecology), whereas for another society progress may mean “as much ecological/natural automation as possible” (i.e. minimum possible human intervention, maximum ecology minimum technology).

One ideal points to (ecologically unsustainable, unhealthy, corporate and investor friendly) industrial agriculture, other ideal points to (healthy, ecologically sustainable) ecological agriculture.

## **B.2. Influence of neoliberal think-tanks on the academy and education of economics**

In my [3<sup>rd</sup> PhD progress report](#), I had mentioned the foundation of **Mont Pelerin Society** in Switzerland in 1947, and the potential influence of neoliberal think-tanks on the academy and education of economics. Cognitive scientist Joe Brewer raises following central question:

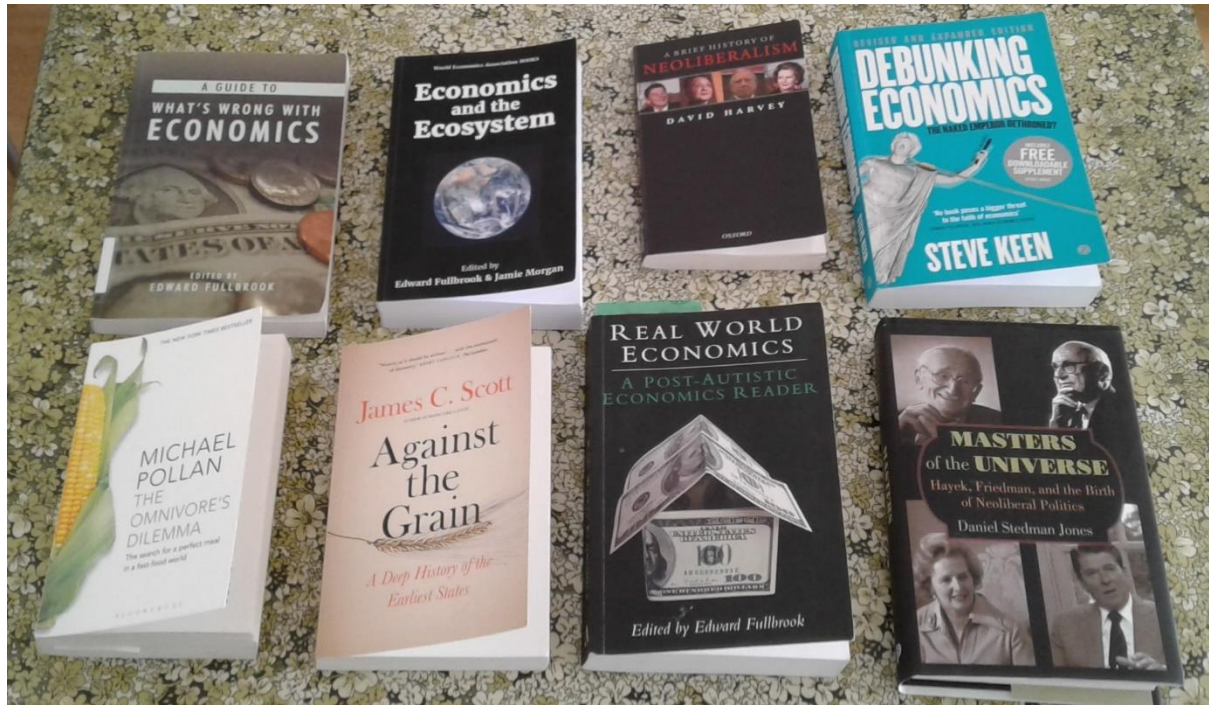
Brewer: “If economics tried to be scientific, why didn't it update its theories with biology and ecology?” (Brewer, 2019; → [video: 2019 Conference Day 2 Village 3, at 17:00](#))

He explains this with the influence of [Mont Pelerin Society](#) founded in Switzerland in 1947, by economists like Hayek and Friedman, and a handful of wealthy business people. The agenda of this society would be spreading the ideology of **neoliberalism** (free market ideology) through the formal education of mainstream (neoclassical) economics at certain universities, along with other channels like business schools and finance departments.

Wealthy investors and other business interests supported neoliberalism, because it enabled them to pursue their extractive businesses without inconvenient obstacles like stringent government regulations. Other kinds legal and democratic restrictions like the institution of Environmental Impact Analysis, or socially and environmentally concerned NGOs should also be crippled down to remove potential obstacles to easy profits (Brewer, 2016).



Accordingly, the public awareness and knowledge of ecology (in relation with sustainable well-being) should be kept to minimum, because it makes the huge costs of social and environmental externalities caused by extractive businesses too obvious.



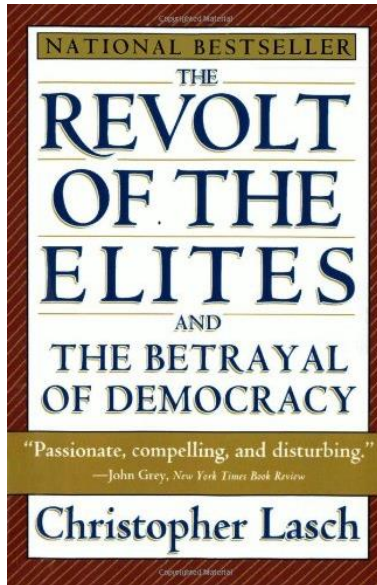
After reading several books and articles about the history of neoliberalism, I've come to the conclusion that neoliberal think-tanks and foundations like William Volker Foundation (WVF), American Enterprise Institute (AEI), Foundation for Economic Education (FEE), Institute of Economic Affairs (IEA), Center for Policy Studies (CPS), Adam Smith Institutes (ASI), Heritage Foundation and Cato Institute (all spinoffs of the Mont Pelerin Society founded in 1947) had a profound influence on the mainstream academy, politics, media and education.

These neoliberal think-tanks, institutes and foundations, backed by powerful business interests and a handful of wealthy individuals, had such an influence on the academy and education (especially on the most prestigious universities in US and UK) that many heterodox thinkers like Michael Hudson, Naomi Klein, Edward Fullbrook, Joseph Stiglitz and David Harvey came to equate mainstream economics to **neoliberal economics** after 1990.

Perter Söderbaum is one of the many unorthodox economists, who think, there is not much difference between neoclassical and neoliberal economics: "The neoclassical paradigm is specific not only in scientific terms but also in ideological terms. The ideology of neoclassical theory and method is close to *market fundamentalism*. In terms of ideological orientation, the neoclassical theory and conceptual framework has contributed to legitimize neoliberalism." (Söderbaum, 2019; → [Toward sustainable development: from neoclassical monopoly to democracy-oriented economics](#))

Eloquent and concise, "A Brief History of Neoliberalism" (2005) by D. Harvey tells the history of neoliberal thought and its global application. "The Revolt of the Elites" (1995) by the historian Christopher Lasch is another brilliant book that explains the social and ideological foundations of neoliberal (and post-modernist) order, first in USA, then in the world:





How did the majority of US voters give their consent to neoliberal policies (by electing Reagan as president) against their own economic and democratic interests? Why couldn't the left wing assess the tension between individual freedom and social justice properly, and timely react to pending neoliberal (anti-collectivist, anti-welfare-state) policies with viable alternatives? Why were the elites of the left-wing disconnected from the majority? How was **neo-conservatism** of the Reagan or Bush era, that easily colluded with neoliberalism, different from the older real conservatism that also tried to protect nature and lifestyle along with traditional values?

Because neoliberalism came to power by collaborating with the new kind of conservatism (e.g. neoconservatives in USA) the neoliberal world order cannot be thought independently of neoconservatism (Lasch, 1995). Neoconservatism added reckless Anglo-American (Western white man) imperialism and militarism to the already exploitative flavour of neoliberalism, as we have witnessed in the occupation of Iraq. Accordingly, neoliberal economics was further evolved to ignore or downplay the role of imperialism (and military force) in economic analysis.

Most popular introductory textbooks (like Mankiw's "Principle of Economics") give the impression to unsuspecting students that we live in an ideal and benevolent world (not necessarily benevolent by intention, but benevolent by the invisible hand of the free competitive market), in which all institutes, states and firms (deliberately or not) work for the good of all societies. Thus, popular economics textbooks foster the perception that mainstream (neoclassical or neoliberal) economics, as a universal receipt for economic development and wellbeing, is an **objective and benevolent science** (i.e. respectable real science in the service of whole humanity including future generations).

If neoclassical economics limited the scope of the classical political economy through formalization and mathematization (especially by Menger, Walras and Jevons) toward the end of 19<sup>th</sup> century (based on a series of unrealistic assumptions like utility-maximizing rational consumer and competitive market equilibrium), **neoliberal influence** carried this process of sterilization several steps further toward the end of the 20. century, to the degree of expunging subject matters like "history of economy" and "history of economic thought" from the curriculum of economics (i.e. further sterilization, ossification and isolation of mainstream economics from competing ideas and body of knowledge like history, ecology and anthropology).

Even compared to the foundations of neoclassical economics, **neoliberal economics** seems to have increased the degree of ideological blindness to ecological and social realities of life, and especially to many drawbacks of corporate monopolies or oligopolies in the context of market failures.

D. Stedman Jones: "Both theories (public choice and rational choice theory) are built on the assumptions of neoclassical economics; especially the concept of individual as a rational utility-maximizer. Too often in the accounts of its critics, such as Naomi Klein, David Harvey or Andrew Glyn, neoliberalism has been assumed to be little more than a reflection of the dominance of neoclassical economics." (Jones, 2012, page 88)

**Basic features of neoliberal economics** (i.e. mainstream economics after 1990) are:

1. Limiting the scope of economic analysis to business realm only; that is, market, state, firms and consumers alone, ignoring or downplaying the complex social and ecological realities of life

2. Reducing all economic transactions to momentary exchange in the market; ignoring the past and future (i.e. lack of long-term view into the past or future), ignoring the historical and evolutionary aspects of life
3. Free market fundamentalism with the delusional idea of quasi-static equilibrium in its centre (i.e. reducing dynamic events in real life to mere statistical analysis), as if free markets with fair competition could solve every social and ecological problem in life
4. Blind belief in technological progress (technological fundamentalism) as if technological progress can solve every kind of social and ecological problems
5. The delusional idea of linear continuous progress in human history; from hunter-gatherers (most primitive) to agrarian states, from agrarian states to industrial digital societies (most advanced and civilized)
6. Strong emphasis on individual freedom, which is conceptually reduced to *individual choice* in the context of market, and which is in practice equated to freedom of profit-oriented extractive corporations (that are somehow denoted as private individuals despite their size and structure) against all kinds of democratic and collective regulations (in the name of free markets, free trade, free private enterprise, the sanctity of private property etc.)
7. Not bothering much about the problem of oligarchies (i.e. market failures caused by monopolies or oligarchies) as long as these oligarchies are controlled by wealthy investors and investment funds (finance, rentier class).
8. Growth fetishism (growthism); misusing the concept of economic growth (i.e. increase in GDP) as a measure of development and well-being
9. Sticking to the limitless world paradigm (i.e. ideology of continuous growth and progress) despite all evidence (including climate change)
10. Hostility against inconvenient state regulation: Though strongly against central economic planning and regulation directly by welfare state, not necessarily against (indirect) central planning and regulation by global organizations like World Bank, World Trade Organisation or IMF that usually serve to the short-term monetary interests of big investors multinational corporations.

All these points above are attributes of the **neoliberal worldview** that began to dominate mainstream economics since 1980 (Hudson M, Keen S, Harvey D, Klein N, Jones Stedman D).

Harvey: "... business schools that arose in prestigious universities such as Stanford and Harvard, generously funded by corporations and foundations, became centres of neoliberal orthodoxy from the very moment they opened." (Harvey, 2003, page 54)

In fact, most mainstream (neoclassical) economists take rational utility-maximizing individuals (rational consumer Homo economicus) and general equilibrium theory (demand, supply, price in a market) for granted. These fundamentally flawed theories are used for the **scientific justification** of the neoliberal ideology (free market fundamentalism); "leave it to the free (unregulated) market which distributes wealth optimally for the common good if left to its own devices."

Ecological economist William E. Rees writes: "Neoliberal models incorporate a stunted caricature of human behaviour (i.e. Homo economicus, the rational utility-maximizing consumer), virtually ignore socio-cultural dynamics and make no significant reference to the biophysical systems with which the economy interacts." (Rees, 2019; → [End game: the economy as eco-catastrophe and what needs to change](#))

After 1980, neoliberal-minded economists begin to dominate **international organizations** that shaped the economic system of the world:

Jones: “The principles of neoliberalism were adopted by economists and policymakers of the International Money Fund (IMF), the World Bank (WB), the World Trade Organisation (WTO), the EU, and as part of the North American Free Trade Agreement (NAFTA).” (Jones 2012, page 8)

Ecological economist Herman Daly wrote, IMF, WB and WTO serve to the interests of “global economy”, which in practice means, to the interests of transnational corporations (Daly, 2019; → [Growthism: its ecological, economic and ethical limits](#)).

For many critical-minded economists like Peter Söderbaum, international organisations like EU, IMF, WB and WTO played an important role in spreading and protecting the neoliberal ideology:

Söderbaum: “In [even allegedly democratic] nations such as Sweden and globally, an economic growth [growthism] and market ideology is dominant to such an extent that one can refer to this specific market ideology as a **kind of dictatorship**. Behind this are, as I see it, university departments of economics (with neoclassical theory in a monopoly position) but also international organizations such as the European Union (EU) with its specific organizational infrastructure, the World Trade Organization (WTO), the World Bank and the International Monetary Fund (IMF). Transnational corporations with their lobbyists also play a role in defending this market ideology.” (Söderbaum, 2019; → [Toward sustainable development](#))



The **neoliberal world order** of free extraction and free exploitation (by corporations and their investors) in the name of free market, free trade and free private enterprise is explained in detail in books like [Auf Kosten Anderer](#) (2017; in English “at the cost of others”) and *Imperiale Lebensweise* (2017; imperial lifestyle in English, → [The Limits to Capitalist Nature](#) by U. Brand and M. Wissen). Note that these sociologists equate industrial urban lifestyle (coloured by consumerism) to imperial lifestyle, because they think, such a high-consumption lifestyle can’t be sustained without some kind of economic imperialism.

An important trickery was legally and rhetorically equating a multinational corporation (which can be a giant, strictly hierarchically organised bureaucratic organization with thousands of employees, central planning, business associations and politically influential lobbies) to a **private individual**. In that way, freedom of corporations could be defended in the name of individual freedom, whereas individual freedom in turn was reduced to *consumer choice* in the limited context of the market (Foster, Clark, York, 2010; “The Ecological Rift”).

Chief promoters of the neoliberal ideology (neoliberal economists and business interests) saw **economy departments** of elite universities and business schools like Princeton, Harvard, Chicago, MIT and London School of Economics (LSE) as strategic intellectual centres for the further perfection and propagation of their teaching:

Harvey: “Charting the spread of ideas is always difficult, but by 1990 or so most economics departments in the major research universities as well as the business schools were dominated by neoliberal modes of thought.” (Harvey, 2003, page 54)

How did these think-tanks influence academy and education of economics? So far, I’ve identified five **primary means** that are deployed (deliberately or not) to influence the academy and education:

1. Adverse selection of students; becoming aware of the narrow, reductionist, unrealistically abstract and dogmatic way of teaching, most perceptive students tend to leave the profession (Reardon J, Keen S, Hudson M)

2. Adverse (biased) selection in academy (universities and business schools) which is dominated by the neoclassical and neoliberal thought
3. Prestigious academic journals whose selection processes are dominated by the mainstream school of thought
4. Endowment of disproportionate and undeserved scientific respectability to neoliberal economists like M. Friedman, F. Hayek, R. Coase and G. Stigler through Nobel Prize of Swedish Central Bank (Felber, 2019; → [The fake Nobel Prize that helped neoliberalism conquer the world](#))
5. Determining the priority and direction of research by funding only favourable research projects

Economist Michael Hudson, the author of “J is for Junk Economics”, says: “As Veblen had also pointed out, in the Higher Education in America, business interests want to promote an economic doctrine that celebrates them and rationalizes their behaviour as being good for the economy (hence, growing pie and trickle-down theories), not criticizes them.” (Hudson, 2017, November 29; → [History of Neoliberal Economics, at 3:30 in video](#), → [transcript of the interview](#)).

Here, Hudson, like Veblen, implies that mainstream economics has become a **business ideology** through *cultural evolution*; a process that cherished and cherry-picked favourable ideas, and rejected inconvenient insights, critiques and even entire fields of knowledge like history, ecology and anthropology.

Free market fundamentalism (or deception) of neoliberalism has already started with the advent of neoclassical economics, with the idea of efficiently allocating (Pareto optimal) competitive markets based on a series of crude and unrealistic assumptions like “rational utility-maximizing consumer (Homo economicus) with independent (i.e. individualistic) and fixed preference order”.

Söderbaum: “The present kind of capitalism is largely made legitimate through the domination of neoclassical economics as economics paradigm and neoliberalism as [political] ideology. It should be made clear that neoclassical economics and neoliberalism are not totally separate but rather overlap” (Söderbaum, 2019).

According to M. Hudson, mainstream economics has become “junk economics” with lots of deceptive language and double talk (after the style of Orwell’s 1984). Hudson says, free market meant for **classical economists** like Smith and Mill, a market which is free from rent; free from the landlord, free from the monopolist, free from the bank, free from undeserved (parasitic) earnings... After 1890, the rentier class fought back and distorted the meaning of free market (which was politically associated with individual freedom) to make it “free from government regulations, free from tax; free (unregulated) earnings for every kind of private property owner (including patents), landlords, monopolists and banks.” (Hudson, 2018; → [video: Michael Hudson explains Junk economics](#), at 15:00)

Business interests were quite successful in their campaigns; following cliché is one of the best-established doctrines of the mainstream economics and politics: “What’s good for the business is also good for the society”, as if the interests of corporations and societies were perfectly aligned, without any conflicts of interests at all (Foster & Clark, 2009; → **Lauderdale Paradox**, [The Paradox of Wealth: Capitalism and Ecological Destruction](#)).

According to this doctrine, fostering a “good business climate” (i.e. strong private property rights, free market and trade without annoying public scrutiny or state regulations) is one of the foremost duties of a state (Harvey, 2003).

Hudson explains the relationship between **financial interests** (i.e. big investors), influential government posts and mainstream economists as follows:



Hudson: “In a similar way (→ deception tactics of big tobacco companies, “Merchants of Doubt” by Oreskes & Conway, “Whitewash” by Gillam), economists have been mobilized to serve, wittingly or unwittingly, as public relations lobbies for global financial interests. Chicago graduates and their clones (i.e. neoliberal economists), trained in strategy at Goldman Sachs or similar financial breeding grounds, monopolize the staffs of finance ministries, treasury departments, central banks and the leading global financial institutions.” (Hudson, 2017; → “J is for Junk Economics”)

Economist Neva Goodwin thinks, the dominant economic theory is used to justify the global economic system that produce sub-optimal results for the majority, though benefitting the short-term gains of the rich and powerful (Goodwin, 2019; → [Addressing meta-externalities](#)).

Goodwin argues furthermore, that the free market ideology was misused to eliminate all kinds of controls and **regulations** that limit the hands of big corporations: “From this (free market ideology) emerged the truly suspect idea that market actors (especially large, powerful or rich economic actors) should be free to do whatever they choose; any meddling from non-market forces (such as governments) would divert the economy away from the best possible outcome.” (Goodwin, 2019).

A **contempt and distrust for state regulations** is one of the most distinctive features of neoliberal economics, especially if these regulations are not favourable for business interests.

Economist Richard B. Norgaard draws attention to the often-overlooked fact that corporations can be giant bureaucratic and hierarchical organisations that are run by “command and control”, just like states. And many corporations do “central planning”, sometimes even global planning, together with their international allies like World Bank (WB), IMF and World Trade Organisation (WTO). For example, plans of global corporations like Monsanto have been imposed on several 3<sup>rd</sup> world countries by WB and WTO in the context of industrial agriculture (Shiva, 2016; → “Who Really Feeds the World”).

Norgaard: “People, with the help of the economics profession, have come to worship markets and condemn the supposed inefficiency of governmental “command and control”. Yet we ignore the phenomenal rise of the large **corporations** that employ us and provide us with our daily goods and services. Corporations large, many larger than nation-states, as well as small are organized and supposedly run efficiently by command and control.” (Norgaard, 2019; → [Economism and the Econocene: a coevolutionary interpretation](#))

Vandana Shiva describes the evolution of neoliberal state as follows: “Governments mutate from welfare states to *corporate states* as they deregulate corporations and over-regulate citizens. This is then defined as ‘free market democracy.’” (Shiva V, 2013, page 21; → “Making Peace with the Earth”)

Michael Pollan, author of best-seller books like “The Botany of Desire” and “Omnivore’s Dilemma”, makes in one of his speeches a very interesting remark (in the context if food regulations for public health) that shows how deeply the neoliberal beliefs are ingrained in the values of the society (Pollan, 2013; → [video: How Cooking Can Change Your Life](#), at 15:48): “We recoil at **social engineering** by the government, but for some reason, we accept it by the industry [through mass media, education and advertisements].”

In the absence of rigorous regulations, all an extractive venture needs, is manufacturing public consent (unless it is reckless enough to use coercive force). In order to obtain the public consent, and numb all defensive reactions, the extractive venture must somehow be able to appear as “benevolent contributor” to the society.

In her book “The Value of Everything” (2018), economist Mariana Mazzucato writes about “extraction (**parasitic earnings**) in the disguise of value creation”. Thinking in similar lines and

inspired by the parasitism in biology, Hudson builds a revealing analogy between biologic and economic parasites:

“In biology, parasites avoid detection by masquerading as part of the host’s body, using enzymes to take control of the host’s brain to block it from taking counter-measures to defend itself. Similarly, rentiers and monopolists masquerade as contributors to the production process, as if their revenue is earned (i.e. deserved). Their intellectual enzyme is *junk economics* (i.e. neoclassical economics) demobilizing governments and academic studies.” (Hudson, 2017)

In this analogy, parasitic investor or property owner is a parasite in the cloak of a benevolent contributor or cooperator. In the language of biology: Parasite masquerading as symbiont!

False cleanerfish (*Aspidontus tractus*) which mimics the real cleanerfish to deceive its hosts is a typical example of biologic parasite (Sutton, 2018; → [False Cleanerfish – Facts and Photographs](#)). Its deception tactic is very similar to the tactic of a parasitic investor: Benevolent appearance

In similar vein, Shiva says ironically “they (investors) always do us a favour while they steal our resources.” (Shiva, 2014; → [Rethinking development in the 21st century, begins at 33:00 in video](#))

Just like parasites in disguise, investors with their extractive undertakings (like dirty industry/mining/energy projects or industrial agriculture based on unsustainable monocultures) need refined and well tested deception tactics to deceive the gullible majority. The deception tactic they generally employ is, using the elusive and misleading concepts of mainstream economics like “economic growth & development, technological progress, job creation, modernisation” that divert all the attention from the social and environmental destruction (invisible externalities) to the imagery of progress and short-term monetary income (Kopp et al., 2017; → [AufKostenAnderer.org](#)).

So, how does neoliberal ideology clash with ecological literacy? In other words, how does neoliberalism profit from **ecological illiteracy**, and how does it protect and foster this particular kind of *useful ignorance*?

If we consider (1) free competitive markets (2) individualism (3) technological fundamentalism (4) belief in continuous progress (5) consumerism (6) contempt for all kinds of collective actions against business interests (7) contempt for state regulations against business interests (8) growthism; belief in limitless growth, extraction and expansion (9) mechanistic and reductionist worldview and premature mathematization (10) lack of historical consciousness (11) limited scope of economic inquiry which is limited to business realm only, as **main pillars of neoliberal economics**, we can claim that ecological literacy is in conflict with all these ideological pillars, where the conflict is most obvious and direct with following pillars:

(3) technological fundamentalism (5) consumerism (8) growthism (9) mechanistic and reductionist worldview (11) limited scope of economic inquiry

If we take **growthism** as an example, teaching ecology (including planetary boundaries) and “limitless growth” at the same time in a school would be like teaching evolution theory and intelligent design (religious creationism in disguise) simultaneously. The fanatic adherents of creationism would certainly do everything in their power to discredit, censure and abolish evolution theory, as they actually do in some ultra-conservative (and neoliberal) states of the USA.

### **B.3. Industrial Paradigm: Human-centered, mechanistic and reductionist worldview**

Industrial paradigm is the human-centered, mechanistic and reductionist worldview that dominates science, education and especially economic thought since industrial revolution.

For the industrial paradigm, we humans are not a part of the nature; we are outside the realm of nature.



We stand above all other animals and plants; we are created to dominate and reshape the nature which is a place of wild chaos, barbarism and misery without humans. The world is created for us humans. This means, nature can easily be sacrificed for the comfort, convenience and progress of humans.

For the industrial paradigm, nature is not an active producer; nature is only a passive raw material resource, a passive infrastructure of life, and a passive dumping ground with a certain capacity for endurance and recycling. In other words, nature is not a living ecosystem; it is only a dead, non-living resource without inherent consciousness or intelligence.

There is only one kind of producer: Humans. Everything else is only resource.

Among God's creations only humans have souls, and accordingly intelligence and consciousness; everything else, including all living beings and ecosystems, can be seen as parts of a giant machine (Cartesian machine-world paradigm).

Nature is for the industrial paradigm a place of wild and disordered entity that must be tamed and ordered according to the tastes and preferences of civilized humans.

As a consequence of this narrow worldview, industrial paradigm focuses only on human-made things like buildings, roads, cars, computers, smart phones and so on, when it talks about economy, production or technology.

For the industrial paradigm, a giant marine ecosystem that produces (among many other things) millions of tons of fish is not a producer. The only producers are the fishermen who catch, process and sell these fish.

Historically, industrial paradigm --like neoclassical economics-- is a co-production of human-centered religious worldview, industrial revolution, imperialism and economic thought in the 18., 19. and 20. centuries. With its focus on human-made things and money, it serves perfectly well to the narrow and short-sighted interests of corporations.

A person, whose mind is shaped by the industrial paradigm, typically seeks solutions to every kind of problems with human-made technologies; s/he does not take into account the solutions of nature (ecosystems) or traditions that are based on a very rich biological and cultural diversity. In most cases, she cultivates a blind belief in technological progress (i.e. technological progress can solve all kinds of social and ecological problems of humanity).

Considering **externalities** erroneously as exceptional and rare occurrences (Hunt & Lautzenheiser, 2011) is a natural consequence of the industrial paradigm that ignores complex social and ecological interactions through mechanistic reductionism. There seems to be a close causal link between (a) specialization, compartmentalization and separation in modern (industrial) education, and (b) mental blindness to complex social and ecological inter-relationships.

Each discipline in modern (industrial) science has its virtual boundary, and the complex inter-relationships (i.e. external influences and constraints) between these disciplines are often overlooked, because there are not many people today who can transcend the disciplinary boundaries and understand multiple disciplines.

**Mathematics** warns us too, against the dangers of ignoring or underestimating complex inter-relationships. Devising economic policies for the ultimate goal (e.g. sustainable well-being for all) is a kind of constrained holistic (multi-dimensional) optimization problem, like biological or cultural evolution. If one overlooks some important factors (inputs), relationships or constraints in an optimization problem, one will be doomed to failure. In some cases, non action (i.e. no interference) is even better than faulty optimization (i.e. sub-optimization).

Before the 16. century, “organic world” paradigm (in contrast to **machine-world paradigm**) was still the prevalent worldview even in West Europe. In “The Death of Nature”, Carolyn Merchant tells the history of transition from the “organic world” to “machine world” paradigm during the industrial revolution (from 15. to 19. century), as a history of cultural evolution (Merchant, 1990).

Merchant: “Between the 16<sup>th</sup> and 17<sup>th</sup> centuries, the image of an organic cosmos with a female living earth at its centre [mother earth] gave way to a mechanistic worldview in which nature was reconstructed as dead and passive, to be dominated and controlled by humans.” (Merchant, 1990, page XVI)

Before machine-world paradigm became the dominant worldview, pervasive ethical and religious norms condemned and limited destructive activities like aggressive mining and deforestation. Such aggressive exploitation of nature was considered an insidious crime against “mother earth” who was the provider of all living creatures.

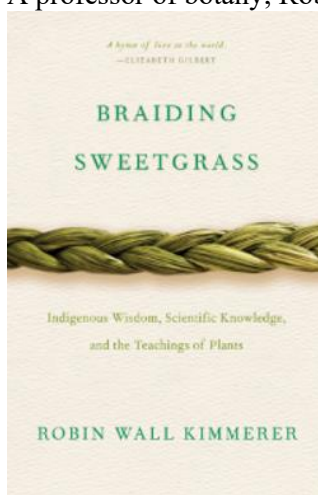
Merchant: “The metaphor of the earth as nurturing mother was gradually to vanish as a dominant image as the Scientific Revolution proceeded to mechanize and to rationalize the world view. The second image, nature as [wild] disorder, called forth an important modern idea, that of power over nature. Two new ideas, those of mechanism and the domination and mastery of nature, became core concepts of the modern world” (Merchant, 1990, page 2)

Mechanistic worldview that declared mother earth as a dead, wild and disordered entity without any intelligence or consciousness, sanctioned aggressive exploitation as **progress**, and legitimated the industrial revolution with its side-effects of resource depletion and pollution. Terms like “economic development” or “economic growth” are modern expressions of the Western ideology of progress (economic growth became a mantra of economics since 1950).

Merchant: “One does not readily slay a mother, dig into her entrails for gold or mutilate her body, although commercial mining would soon require that. As long as the earth was considered to be alive and sensitive, it could be considered a breach of human ethical behaviour to carry out destructive acts against it.” (Merchant, 1990, page 3)

Not only economics; mechanistic paradigm has even influenced the theory and education of biological sciences significantly:

A professor of botany, Robin Wall Kimmerer writes in “Braiding Sweetgrass” (2015): “The botany I was taught (at college) was reductionist, mechanistic, and strictly objective. Plants were reduced to objects; they were not subjects.”



Kimmerer asks, what really supports our lives? What is the primary producer? Plants or corporations?

Kimmerer: “Our natural tendency to pay attention to things that support our lives has been hijacked by advertisers.” Unsurprising outcome of industrial lifestyle and education: Children who can recognize more than 100 company logos can hardly recognize 10 plant species. (Kimmerer, 2017; → [video: The Teachings of Plants, at 35:42](#))

Following generalization about the goods and bads of industrial paradigm –if true—might explain, why industrial paradigm is a very convenient worldview for profit-oriented corporations with short-term monetary

interests:

Industrial paradigm is good for:

- Earning money at all costs

- Concentrating military and economic power
- Extraction and exploitation
- Monopolization

Industrial paradigm is bad for:

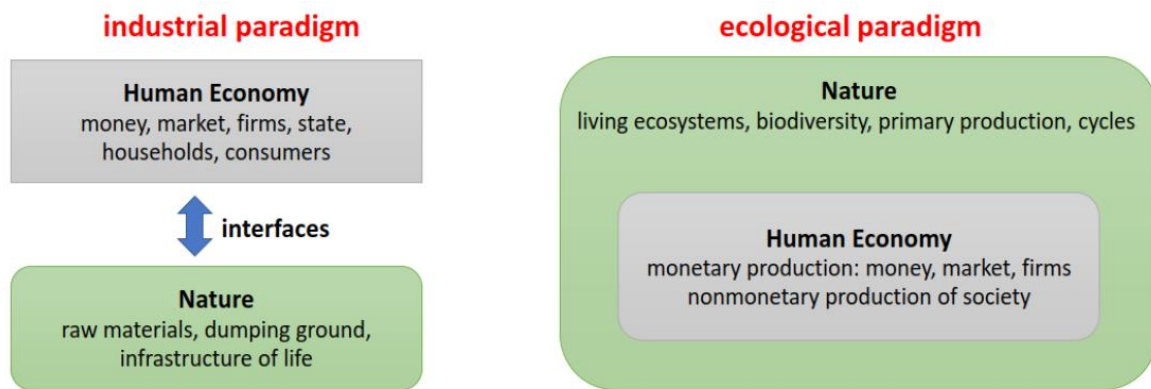
- Well-being for all
- Sustainable life
- Economic justice and equity

Certain disciplines of modern science like ecology, anthropology, quantum mechanics, new thermodynamics (Ilya Prigogine), chaos theory in mathematics (i.e. complex interconnected nonlinear systems) and Gaia Hypothesis seriously challenge the mechanistic worldview. (Merchant, 1990, page XVIII)

#### B.4. Industrial versus Ecological Paradigm

Industrial paradigm may be best explained by the dichotomy of industrial versus ecological paradigm.

**Figure-3** Industrial vs ecological paradigm



For the industrial paradigm, human economy does not reside within the nature; it stands outside of and above the nature as a dominating power, connected to nature via simple interfaces, like the interfaces of a machine, for natural resources.

For example, DDT based pesticides were successfully promoted with marketing slogans like “symbol of humanity’s progress and triumph in its war against the nature” by corporations like Monsanto and DuPont, reflecting the prevalence of industrial paradigm as the dominant worldview of the era (Carson, 1962; → “Silent Spring”).

Industrial paradigm may also admit the existence of **ecosystem services** as often referenced in mainstream “environmental economics” (shallow ecology). That is, a number of distinct (i.e. separated, unrelated) one-way free services provided from nature to us humans, as if humans were not a part of these complex and interconnected natural cycles.

Thanks to the high degree of undervaluation (of nature), reductionism and abstraction, the complex, multi-functional and multi-dimensional relationships between humans and nature can be reduced to simple mechanistic interfaces. For example, a forest as a complex living ecosystem which affects human life in many ways (climate, water, air, soil, recycling, recreation, food source, health etc.) can be reduced to a mere timber resource for human industry.

**Interface** is a term used for the machines and software that can be divided into several distinct components that are connected via simple, machine-like interfaces (modular design).

Talking about interfaces as the connection between humans and nature is one of the most typical manifestations of the mechanistic and reductionist industrial paradigm, which reduces a web of complex inter-connections to a limited number of simple interfaces.

Industrial paradigm models even **agriculture** --based on living plants, animals and soil-- like a mechanic factory which must be fed by fertilizers, water, labour, energy, pesticides etc. (input factors) to produce harvest (output factors); the complex inter-connections with the environment, and the natural cycles in the living soil are almost completely ignored.

As already mentioned above, nature is for the industrial paradigm a passive (non-living) resource of raw materials, a passive dumping ground and a passive infrastructure of life. Nature is like a non-living, passive and mindless residential building that must be kept free of too much dirt (pollution) for the continuation of human health and life.

The narrow mechanistic and reductionist worldview of the industrial paradigm is a delusion that undervalues the essential role of nature in human's life. Ecological paradigm is the more complete, holistic and realistic worldview which sees humans and human economy as a part of nature, within the nature.

For the ecological paradigm, nature is a living ecosystem (organism) and the primary producer that produces (and recycles) most essential things like mild climate, food, water, recreation, stimulation, medicinal plants, materials for various tools etc. for human life. Without the primary production of nature humans (or any other animals) cannot live at all; everything that humans produce (as secondary production) are based on the primary production of nature, including minerals like oil.

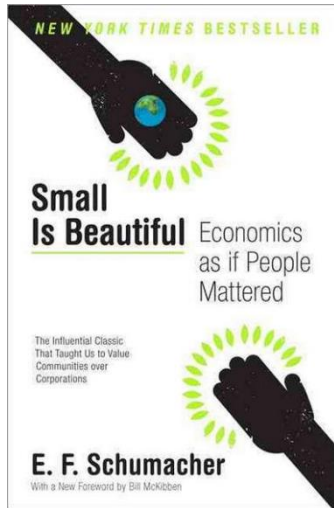
Industrial paradigm is generally obsessed with only one kind of production: Monetary human production; things that humans (or firms) produce to sell on the market for money. The fallacy of measuring total economic production with money flow alone (GDP: Gross Domestic Product) reflects perfectly influence of the narrow worldview of industrial paradigm.

One of the most common symptoms of industrial paradigm is, talking about **healthcare** as if it were purely a human-made industrial service (drugs, operations, therapy etc.) offered by either state or private sector, completely disconnected from the environment, lifestyle, food, preventive public health policies and immune systems of human organisms. A similar worldview dominates industrial agriculture and industrial food sectors.

We know today that many deadly diseases including cancer are caused by environmental destruction and pollution like GMOs and pesticides, and also by lifestyle (for example, not enough clean air or physical exercise), and also by unbalanced (monocultural) junk food.

Ecological paradigm can perceive all kinds of production: Production of nature, non-monetary production of societies, monetary production of societies... Ecological paradigm is also aware of the cycles of nature (production + recycling = reproduction), and knows that understanding cycles is essential for understanding sustainability; i.e. what makes a society sustainable or unsustainable.

So, ecological paradigm is perfectly aware of the fact that a society, which is obsessed with monetary production can be destroying the foundations of its non-monetary reproduction (and life) in the single-minded quest for increasing monetary production (i.e. GDP growth).



In his book “Small is Beautiful” (1973), E.F. Schumacher (1911-1977) criticized the Western ideology of continuous and limitless progress which is built in industrial paradigm:

“Ever-bigger machines, entailing ever-bigger violence against the environment do not represent progress; they are denial of wisdom.”

Because, wisdom requires the ability to see the complete picture (i.e. holistic view) to find the balance among many welfare factors including planetary limits to growth.

Schumacher realized that many human technologies served primarily to the extraction, monopolization and concentration of economic power; not to the improvement of general welfare for today’s and future’s generations.

Schumacher pointed to the fact that nature is the **primary producer** (i.e. primary reproducer considering the cycles) that cannot be replaced by mechanistic and non-living human technologies --a fact which is eagerly overlooked:

Schumacher: “The illusion of unlimited power, nourished by astonishing scientific and technological achievements, has produced the concurrent illusion of having solved the problem of production. The latter illusion is based on the failure to distinguish between income and capital where this distinction matters most. Every economist or businessman is familiar with the distinction, and applies it conscientiously and with considerable subtlety to all economic affairs – except where it really matters – namely, the irreplaceable capital [of nature] which man had not made, but simply found, and without which he can do nothing.” (Schumacher, 1973)

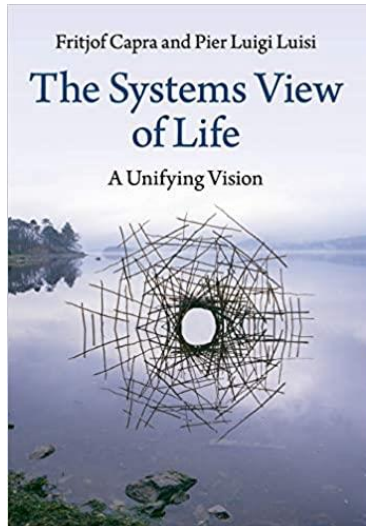
Schumacher thought, undervaluation (or oversight) of the capital and production of nature was a consequence of alienation; alienation from nature (e.g. urban lifestyle), alienation from practical production for one’s own needs:

Schumacher: “One reason for overlooking this vital fact is that we are estranged from reality and inclined to treat as valueless everything that we have not made ourselves. Even the great Dr Marx fell into this devastating error when he formulated the so-called labour theory of value” (Schumacher, 1973).

Both shallow and deep ecology admit that nature is an active producer, but there are some important differences. The Norwegian philosopher Arne Naess (1912-2009) explained these differences as follows (Capra & Luisi, 2014; → “The Systems View of Life”, page 12):

“**Shallow ecology** is anthropocentric (i.e. human-centered). It views humans as above or outside of nature, and the source of all value, and ascribes only instrumental, or use value to nature.”





“**Deep ecology** does not separate humans (or anything else) from the natural environment. It sees the world not as a collection of isolated objects but as a network of phenomena that are fundamentally interconnected and interconnected.”

Environmental economics, that attaches monetary values to selected parts or services of nature, is generally associated with shallow ecology. The more critical and holistic ecological economics is, however, often associated with deep ecology.

Industrial worldview is but even shallower than the shallow ecology, because it doesn't accept that nature is an active reproducer with its own distributed (i.e. decentralized, polycentric) organic intelligence; it views nature as a mere raw material resource and dumping ground for waste. Sometimes, even industrial worldview admits that nature provides humans with an “infrastructure of life”.

Following table compares the values of industrial versus ecological worldview. Note that the values of industrial paradigm like self-assertion, expansion, mechanistic reductionism and centralism are often related with the mentality of patriarchal domination. In that sense, industrial paradigm has male, ecological paradigm has female characteristics.

**Figure-4** Industrial versus Ecological Worldview (Capra & Luisi, 2014; “The Systems View of Life”, page 13)

seen as shifts from self-assertion to integration. These two tendencies – the self-assertive and the integrative – are both essential aspects of all living systems, as we discuss in Chapter 4 (Section 4.1.2). Neither of them is intrinsically good or bad. What is good, or healthy, is a dynamic balance; what is bad, or unhealthy, is imbalance – overemphasis on one tendency and neglect of the other. When we look at our modern industrial culture, we see that we have overemphasized the self-assertive and neglected the integrative tendencies. This is apparent both in our thinking and in our values. It is very instructive to put these opposite tendencies side by side.

**industrial vs ecological worldview**

thinking		values	
self-assertive	integrative	self-assertive	integrative
rational	intuitive	expansion	conservation
analysis	synthesis	competition	cooperation
reductionist	holistic	quantity	quality
linear	nonlinear	domination	partnership

When we look at this table, we notice that the self-assertive values – competition, expansion, domination – are generally associated with men. Indeed, in patriarchal societies they are not only favored but also given economic rewards and political power. This is one of the reasons why the shift to a more balanced value system is so difficult for most people, and especially for most men.

Capra & Luisi: “The cyclical nature of ecological processes is an important principle of ecology. ... A major clash between economics and ecology derives from the fact that nature is cyclical, whereas our industrial systems are linear.” (Capra & Luisi, 2014; “The Systems View of Life”, page 254)



“our industrial systems are linear” means, neither industrial education nor mainstream economics care much about what happens before or after the linear production process, as if nature had no limits both for raw and waste materials.

Like Carolyn Merchant in her book “The Death of Nature” (1990), Vandana Shiva underlines the relationship between mechanistic worldview and patriarchal (male) domination mentality in one of her speeches: “This process has allowed the illusion that the earth has no creative power. And along with the earth and nature, women are defined into a passive inert nature. Their only function is [acting as] reproductive machines.” (Shiva, 2020, March 25; → [YouTube video \(at 7:00\): Ecofeminism and the decolonization of women, nature and the future](#)). In this speech, Shiva talks about “false assumptions of superiority and separation [e.g. ecological Apartheid]”; that is, superiority of a certain culture (i.e. Western culture), superiority of a certain race (e.g. white people), superiority of men over women, superiority of humans over non-humans, separation of human culture and economy from nature, and so on (i.e. constructed hierarchies). Shiva has also some words about Artificial Intelligence which is expected to make the majority of humanity unemployed: “Artificial Intelligence is downloading the mechanical paradigm in our age of capitalist patriarchy.”

Industrial paradigm is also closely related with centralism and monopolism, because it is blind to **organic intelligence** which is distributed to all cells of an organism or an ecosystem. Take an organ like heart as an example: We don’t know exactly how heart works (i.e. it pumps blood into arteries and veins among many other things) so reliably with such a precision for such a long time, but know that the intelligence of its work is distributed to the whole organism; brain, heart and all other organs and cells, because all of them are tightly interconnected.

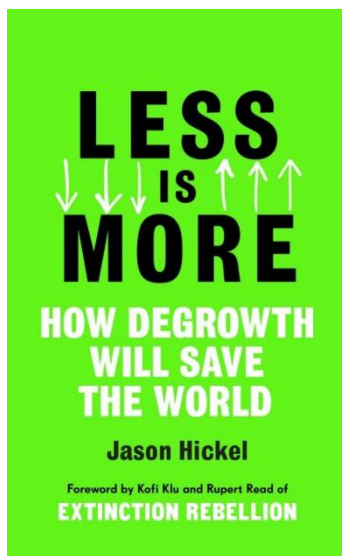
The authors of “The Systems View of Life” (2014), Capra and Luisi, summarize the **characteristics of complex systems** like living ecosystems as follows (compared to mechanistic systems, page 80-81):

- Shift of perspective from the parts to the whole: Living systems are integrated wholes whose properties cannot be reduced to those of smaller parts.
- Inherent multi-disciplinarity: All living (socio-ecological) systems share a set of common properties and principles of organisation. And every part of a living system is connected with all other parts. This means, systems thinking is inherently multidisciplinary.
- From objects to relationships: In mechanistic view there are objects and relationships, but relations are secondary; presumably rigid and immutable objects are the primary features of the system. In systems view, we realize that objects are mere networks of relationships, embedded in larger networks. Thus, relationships are primary in systems thinking. The boundaries of perceived patters (i.e. objects) are secondary.
- From measuring to mapping: In mechanistic science, things (i.e. objects) need to be measured and weighed. But relationships cannot be measured and mapped; they need to be mapped. When we map relationships, we realize that certain patters occur again and again (networks, cycles, boundaries etc.).
- From quantities to qualities: Mapping relationships and studying patters require qualitative approach; not quantitative. The new mathematics of complexity is mathematics of visual patterns that require qualitative analysis.
- From structures to processes: In systems view, every structure is seen as the manifestation of underlying processes. Living form is more than a shape with a given structure, and more than a static configuration of components in a whole. There is a continual flow of matter through a living system while the general form is maintained. There are cycles like growth and decay, regeneration and development.
- From objective to epistemic science: In Cartesian science, scientific descriptions were believed to be objective; that is, independent of the observer’s process of knowing. In systems science, by

contrast, epistemology (i.e. understanding the process of knowing) has to be included explicitly in the description of natural phenomena. This means, knowledge is always relative and subjective. Heisenberg: “What we observe is not nature itself, but nature exposed to our method of questioning.”

- From Cartesian certainty to approximate knowledge: In systems view, it is recognized that all scientific concepts are limited and approximate. Science can never provide any complete and definitive understanding; that is, there will always be a gap of knowledge and predictability. But the approximations can be improved over time.

For the industrial paradigm, there can be only one kind of real and valuable intelligence: A central intelligence (like the commandant of an army) that dominates and manages many objects or individuals around it, that would supposedly be reduced to chaos without a central organiser. As an antithesis of decentral organic intelligence, this kind of central intelligence can be called as **mechanical intelligence**



In “Less Is More” (2020), anthropologist and economist Hickel explains the dichotomy of central/mechanical versus decentral/organic intelligence by referring to **dualism** (i.e. the dichotomy of mind & body) and **Spinoza** in the context of philosophy.

“Those of us who live in capitalist societies today have been taught to believe [through industrial lifestyle and education] that there is a fundamental distinction between humans and nature: humans are subjects with spirit and mind and agency, whereas nature is an inert, mechanistic object [i.e. machine world paradigm that sees nature as an object without any intelligence]. We inherit these ideas from a long line of thinkers, from Plato to Descartes, who primed us to believe that humans can rightfully exploit nature and subject it to our control.” (Hickel, 2020; → “Less Is More”, page 32)

“Enlightenment thinkers once disparaged animist ideas [i.e. thinking that everything, every living being is interconnected in the world] as backward and unscientific.” (Hickel, 2020; → “Less Is More”, page 33)

The **Cartesian dualism** can be summarized as follows (Hickel, 2020; → “Less Is More”, page 265):

1. There is a fundamental distinction between Creator (God) and Creation.
2. Creation has two parts: Mind (soul) and Body
3. Mind is special; unlike bodies or objects, it is an ethereal divine substance. It cannot be explained by laws of physics or maths. Mind is a part of God.
4. Humans are unique among all creatures in having minds and souls. Animals and plants are just living automata.
5. The rest of the Creation (i.e. Body) including human body and nature, is nothing but inert, unthinking matter.

“Descartes’ ideas had no grounding in empirical evidence, but they became popular among European elites in the 1600s because they bolstered the power of the Church, justified the capitalist exploitation of labour and nature, and gave moral license to colonisation.” (Hickel, 2020; → “Less Is More”, page 265)

In contrast to Descartes, Spinoza argued that while beings like God, souls, humans and nature might seem to be fundamentally different kind of entities, they are in fact just different aspects of a single, grand reality governed by the same forces (i.e. laws of nature). This means, everything is matter and

mind at the same time, God is the universe itself, and every part of the universe is a part of God (pantheist worldview).

Europe had two options: Either the dualist path of Descartes, or the pantheist path of Spinoza. “With the full backing of Church and Capital, Descartes vision won out. It gave legitimacy to the dominant class forces, and justified what they were doing to the world [i.e. exploitation, colonisation]. As a result, today we live in a culture shaped by dualist assumptions.” (Hickel, 2020; → “Less Is More”, page 266)

Interestingly, many claims of Spinoza were affirmed by scientists in following centuries. For example, scientists affirmed that there is no fundamental difference between mind and matter; mind is just an assemblage of matter. Scientists affirmed that there is no fundamental difference between human and non-human creatures; we all evolved from the same organisms (modern synthesis of evolution theory). Scientists affirmed that everything in the universe is ultimately governed by the same laws of physics, even if we cannot understand all these laws. Quantum mechanics discovered that there is no final unchanging particle, and everything is connected to everything else in the universe.

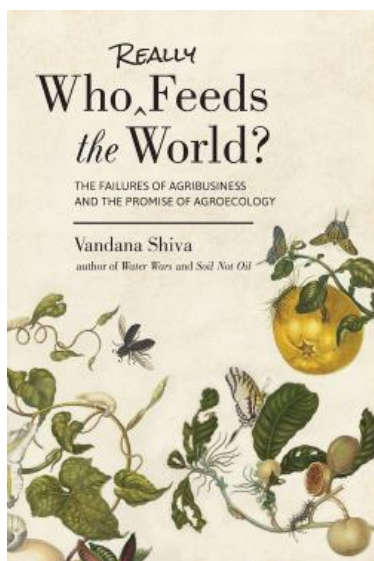
The traces of Cartesian dualism can also be observed in most popular economics textbooks in the context of the **Tragedy of the Commons**. In most cases, the solution offered to the danger of unsustainable use of common resources (like pasture lands) is “mechanistic central intelligence” in the form of private ownership or state regulation. The third option, namely the complex cultural and institutional intelligence of a local community (as elaborated by Elinor Ostrom) is not a feasible option worth mentioning in these textbooks. In fact, the name “Ostrom” does not appear at all in most of these popular textbooks.

The exclusion of “Ostrom” shows us a general pattern of **cultural evolution** in economics: Ideas and theories that are favourable for business readily find place in most popular economics textbooks: For example, Coase theorem and “Tragedy of the Commons” that are eagerly used to justify large-scale privatisations and land grabs in many countries of the world. On the other hand, the ideas of Ostrom, that claim common resources can be used in sustainable ways by local communities, find hardly any place in popular economics textbooks. The conscious and subconscious process of cherry-picking only (for business or state) favourable ideas...

### B.5. Industrial versus Ecological Agriculture

The dichotomy of “industrial paradigm versus ecological paradigm” may be best analysed and

communicated within the context of agriculture: Industrial versus ecological agriculture



Physicist, environmental thinker and activist Vandana Shiva often mentions “industrial paradigm” in the context of agriculture in her books and speeches, like: [Solutions to the food and ecological crisis facing us today](#) (2012, YouTube video, TEDxMasala)

Shiva: “The loss of biodiversity in our food and in our land is caused by industrial agriculture that promote monocultures. ... The rapid erosion of biodiversity has taken place under a food system that sees farms as factories for commodities [industrial paradigm] rather than webs of production and life.” (Shiva, 2016; → “Who Really Feeds the World”, chapter 4, biodiversity feeds the world, not toxic monocultures, page 42)

Shiva thinks, mechanistic worldview creates ideological blindness to organic (i.e. distributed) intelligence of living ecosystems, organisms and societies:

Shiva: “Monocultures of the mind, rooted in a reductionist, mechanistic paradigm, create a blindness to diversity of the world. Based on mechanistic thought, these monocultures are blind to the evolutionary potential and intelligence of the cells, organisms, ecosystems and communities.” (i.e. **organic intelligence**)

It is understandable that corporations prefer industrial to ecological agriculture, simply because there is not much money in ecological agriculture. What can they sell for a farming practice which is inherently self-sufficient and sustainable?

It is also understandable that the corporations can't openly say “we prefer industrial farming because there is so much money in it.” They need other arguments to convince, fool and numb the majority of people. This is where the preconditioning by industrial paradigm, or generally ecological illiteracy comes in.

Thanks to the **ideological blinders** of the industrial paradigm (plus short-term monetary interests and corruption) the majority of the people can be convinced that industrial agriculture with lots of GMOs, chemicals (pesticides and fertilizers), irrigation and controlling technology means “improved efficiency, technological progress, modernization in agriculture, Green Revolution, Smart Farming” and so on.

Why industrial agriculture prefers monocultures is closely related with its mechanistic and reductionist world view: Underestimating the value and (organic) intelligence of biodiversity, replacing organic intelligence by artificial (mechanistic and central) human intelligence, modular design with simple interfaces, replacing non-monopolisable technologies of nature and tradition (like local non-GMO seeds) by monopolisable technologies (like certified GM seeds), input/output factors' paradigm of a factory that ignores nature's cycles and balance among different species, divide and manage policy in modular design...

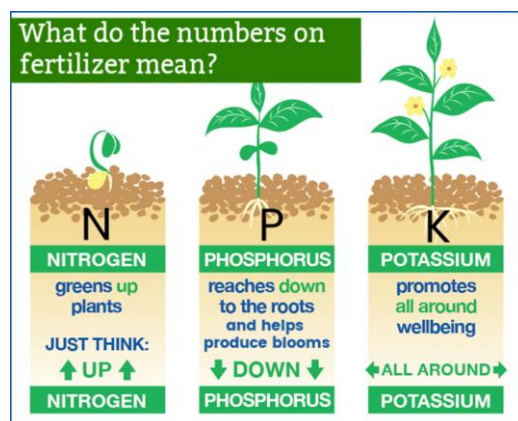
Apropos modular design and divide-and-manage policy: High degree of specialization in education and modern science is another significant feature of the industrial paradigm (**industrial education**) which comes at the cost of losing the ability to see the complete picture (i.e. wisdom).

Generally, corporations don't need that kind of wisdom which comes with holistic thinking. Corporations need tamed and obedient specialists who know their particular fields in meticulous detail, and don't ask disturbing questions about the big picture, like “what am I working for”.

## B.6. NPK-Mentality in industrial agriculture: How living soil was reduced to a non-living substrate for chemical fertilizers

The NPK-mentality in **industrial agriculture** is another model example for the mechanistic reductionism in modern (industrial) science and industry, as explained in “The Omnivore's Dilemma ”

(2006) by Michael Pollan (Pollan, 2010; → [video: Omnivore's Dilemma](#))



NPK-mentality is about reducing the whole soil ecosystem, with thousands of living creatures living in the soil (bacteria, fungi, worms, insects etc.), to a mere non-living, inert and indestructible substrate.

NPK-mentality is also about reducing a complex farming ecosystem to a mechanistic plant or animal factory that could be modelled as a stateless and



memoryless input-output function; water + fertilizer + pesticides + labour IN, plants OUT...

After explaining the importance of humus-rich soil (as a living ecosystem that recycles, stores, transports and transforms many organic nutrients along with minerals and water) which does much more for plants than providing those three basic nutrients, Pollan writes:

Pollan: “To reduce such a vast biological complexity to NPK represented the scientific method at its **reductionist** worst. Complex qualities are reduced to simple quantities; biology gives way to chemistry. As Howard was not the first to point out, that method can only deal with one or two variables at a time. The problem is that once science has reduced a complex phenomenon to couple of variables, however important they may be, the natural tendency is to overlook everything else, to assume that what you can measure is all there is, or at least all that really matters. When we mistake what we can know for all there is to know, a healthy appreciation of one’s ignorance in the face of a mystery like soil fertility gives way to the hubris that we can treat **nature as a machine.**” (Pollan, 2006, page 147)

Sir Albert Howard (1873-1947), referred by Pollan, was a pioneer in organic agriculture. He was one of the distinguished agronomists who had sufficient perception, overview and practical field experience to realize the weaknesses of highly specialized, fragmented and reductionist modern science:

Howard: “The basis of research was obviously to be investigation directed to the whole existence of the selected crop, namely, the plant itself in relation to the soil in which it grows, to the conditions of village agriculture under which it is cultivated, and with reference to the economic use of the product. In other words, “research was to be integral, never fragmented.” (Howard, 1947)

He explained in his ground-breaking books like “The Agricultural Testament” (1940) and “The Soil and Health” (1947) that soil health is crucial for all animals and plants that live over the soil, and health is only possible with a rich biological diversity which makes healthy ecosystems so complex and complete (i.e. self-sufficient) with many internal cycles and emergent properties.

By explaining the reductionist NPK-mentality in agriculture, Pollan also explains certain aspects of **technological fundamentalism** (i.e. misguided technological optimism) in the context of plant fertilizers:

Though German chemist Justus von Liebig, the discoverer of the NPK fertilizer, was probably aware of the complex metabolism of soil, most of his followers believed mistakenly that NPK fertilizer was a complete and ultimate solution for plant growth. Consequently, they thought, the entire mystery of soil fertility had been solved. Therefore, it wasn’t necessary anymore to understand or nurture the complex ecosystem of the soil, because in their eyes, agriculture could be reduced to a mere **plant factory**; just feed the factory with an input of NPK fertilizer (the ultimate technological solution), and collect the output (harvest) of plant crops. (Pollan, 2006, page 147)

Pollan: “Since treating the soil as a machine (or factory) seemed to work well enough, at least in the short term, there no longer seemed any worry about such quaint things as earthworms and humus.”

Howard: “... an infertile soil, that is, one lacking sufficient microbial, fungous, and other life, will pass on some form of deficiency to the plant, and such plant, in turn, will pass on some form of deficiency to animal and man.”

This case also illustrates the close causal relationship between **technological fundamentalism** and ecological ignorance; ecological ignorance (often combined with the lack of historical consciousness and short-termism) feeds technological fundamentalism, and vice versa; technological fundamentalism fosters ecological indifference and ignorance.



Most classical and neoclassical economists considered **land**, and therefore soil, as an indestructible capital with a fixed use value (i.e. indestructible, inert, rock-solid dead matter). But unorthodox economic thinkers like Karl Marx and William Petty, already in the 19<sup>th</sup> century, had a hunch that soil was much more than dead-matter whose fertility must be actively fostered and maintained for future generations:

Marx: “(the systematic expansion of capitalism) disturbs the metabolic interaction between man and earth, prevents the return to the soil of its constituent elements consumed by men in the form of food and clothing; hence it hinders the operation of the eternal natural condition for lasting fertility of the soil.” (Foster, Clark, York, 2010, page 78)

In his article named [Economism and the Econocene: a coevolutionary interpretation](#) (2019) economist Richard Norgaard has a paragraph about the evolution of the Western conception of soil (page 18):

Norgaard: “... historically we understood **soils** mostly as physical and then later as chemical systems. While we now understand soils more as biological systems, or biogeochemical systems, our understanding of the agricultural soils that exist today is more complete, and thus better, when we incorporate how we had historically transformed these biogeochemistry systems through plowing and the application of fertilizers based on our earlier, dominantly physical and chemical, understanding of soils.” (Norgaard, 2019)

Norgaard writes, “we” have today a more holistic and complete picture of soils compared to the common understanding of the 19<sup>th</sup> century. But who are we? Do the students of economics really learn that soil is complex living ecosystem, or do they still learn (consciously or subconsciously) that land is an indestructible, inert and non-living capital?

For a very basic check, I searched after words like “soil, ecosystem, ecology, ecological, humus, topsoil, land” in one of the most popular introductory textbooks: “Principles of Economics” (2015), Gregory Mankiw, 7<sup>th</sup> Edition

### Results:

soil: “In the poorest parts of the world, he argues, nutrient-starved tropical soil makes agriculture a challenge...” (What Makes a Nation Rich? Daron Acemoglu vs Jared Diamond)

soil: “There is no difference in geography between the two halves of Nogales. the weather is the same. The winds are the same, as are the soils.”

soil: “You monitor weather and soil conditions, check your fields for pests and disease, and study the latest advances in farm technology.”

ecosystem: none, ecology: none, ecological: none, humus: none, topsoil: none

land: many, including sentences and phrases like:

“The Other Factors of Production: Land and Capital”

“Once society has allocated people (as well as land, buildings, and machines) to various jobs, it must also allocate the goods and services...”

“Firms produce goods and services using inputs, such as labour, land, and capital (buildings and machines)”

So, concepts like ecosystems, ecology, soil (as living ecosystem), or maintaining the fertility of land or soil are apparently too insignificant issues for Mr Mankiw to be included in an 880-page introductory textbook for economics. For him, economy is about markets, firms, state, land (implicitly

as non-living, inert, indestructible input factor), buildings, machines and other human-made widgets and gadgets (technology); not about the ecological and social aspects of life (externalities).

I wonder, what ratio of economy students would be able to explain the role and importance of humus (topsoil) for a healthy and sustainable agriculture. This is a very basic question about the primary production of a society for a most basic need: Food

In one of her speeches, following question was directed to Vandana Shiva: “How do we teach the next generation to overcome the (physical and mental) separation from nature?” (→ [video: Making Peace with the Earth and Ending Our Separation from It](#), at 45:56 in video). She summarizes the solution as follows:

1. Learning from nature, observing the richness and biodiversity of life
2. Learning from people who actually do the stuff (real farmers, practical work)
3. Learning from the community, cultivating community

### **B.7. Innovation from the perspective of industrial and ecological paradigms; curing symptoms instead of diseases**

Let's begin with the mainstream definitions of “innovation”:

“Innovation in its modern meaning is a new idea, creative thoughts, new imaginations in form of device or method. Innovation is often also viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs.” (Source: [Wikipedia](#))

“The process of translating an idea or invention into a good or service that creates value or for which customers will pay. To be called an innovation, an idea must be replicable at an economical cost and must satisfy a specific need.” (Source: [Business Dictionary](#))

Assume, I have developed a medical pill which is effective against a certain kind of headache, with no or negligible side-effects. Can I call it an innovation?

No, not yet; I need to first do a market research to check. If there is a similar pill, I can't call it an innovation.

Assume, I have done a market research thoroughly, and ascertained that there is not a similar pill produced by any other person or organisation. Can I now call it an innovation?

From the perspective of industrial paradigm yes, from the perspective of ecological paradigm no, not yet.

The perspective of industrial paradigm is limited to human production, and in most cases, even more narrowly to monetary human production; only human-made goods and services that are sold on the market for money. For the humancentric, mechanistic and reductionist worldview of industrial paradigm nature is not a producer.

If you couldn't find a similar product on the market, your product is an innovation for the industrial paradigm. Non-monetary products and services of nature are not visible to industrial paradigm.

But ecological paradigm looks further: Are there any non-monetary solutions of nature, like traditional medicines to this kind of headache? For example, are there any medicinal plants that are (or were) known and used against the same kind of headache by some societies?

Assume, I have examined all known medicinal plants, and all societies of the world, and couldn't find a treatment for this kind of headache. Can I now call my pill an innovation from the perspective of ecological paradigm?

Yes, but only partially, because I haven't yet investigated the causes of this headache. Maybe there are some practices like nutritional habits, lifestyle, regular use of some medicinal plants, regular exercise, clean environment and so on, that will prevent the occurrence of such headaches. Maybe preventive nutrition and lifestyle would as a fundamental solution permanently eradicate such headache, and therefore the necessity for such pills.

So, I can't sell any pills if there is an already known preventive solution which permanently eradicates the need for any medicine. This is the drawback of ecological paradigm from the perspective of a greedy company that wants to earn money at all costs. If the company had a choice in shaping the minds of a society, it would certainly prefer industrial paradigm to ecological paradigm.

One of the primary characteristics of the industrial paradigm, and mainstream (neoclassical) economics shaped by this paradigm, is that, it does not take into account the historical and evolutionary developments that create a need. As a consequence, it doesn't ask the simple question "why do we have such a need?" Instead, it asks directly "how can we satisfy this need?"

So, instead of looking for fundamental solutions that would solve a problem permanently and sustainably, industrial paradigm seeks for superficial and short-term solutions, like a doctor who try to heal symptoms rather than underlying causes of a disease (i.e. curing symptoms rather than diseases).

For example, developing and selling expensive cancer drugs rather than eliminating the causes of cancer like industrial pollution, pesticides and junk food... As you can imagine, there is not much money in cancer prevention, but there is lots of money in selling cancer drugs.

The innovation concept of industrial paradigm requires only the knowledge of markets, products and companies (i.e. scope of mainstream economics). The innovation concept of ecological paradigm requires however a much broader knowledge including the sciences of nature & human like anthropology, biology, ecology, evolution and sociology.

The fact that the industrial paradigm does not question the historical and evolutionary causes of problems or needs, can be partially explained with the mechanistic and reductionist worldview of this paradigm.

Typically, the outcomes (outputs) of a machine are almost directly and immediately linked to its input factors. So, one wouldn't expect to find inside a machine complex internal cycles or a complex web of inter-relationships, that would make the identification of the real causes of problems very difficult. In other words, with a mechanistic and reductionist mindset, one would tend to confuse real causes with the symptoms on the surface, by simply overlooking the complex web of causes and consequences.

Another reason of this shallowness could be the modern industrial education (generally too deficient in philosophy, ecology, literature and fine arts to foster imagination and empathy) that praises extreme technical specialization, which often comes at the cost of losing the ability to see the complete picture.

Here is a real-life example that makes one question the innovation concept of the industrial paradigm:

Agrobusiness companies like Monsanto-Bayer or Syngenta take a seed (maize, cotton or soya), which is a product of many million years of biological evolution and many hundred years of cultural evolution, do some genetic editing at 1-2 spots of a giant genome, and get a patent for this GM seed as if it were their own innovation.

How can the innovation of nature and society ignored, or undervalued to such an extend? My answer would be, ideological blindness to the value of nature and society, caused by the dominant paradigm (i.e. industrial paradigm) of our era.

### B.8. Seeing like a state: Tax collecting state as a model for modern corporation

The history and evolution of sedentary state societies in Mesopotamia, China, Egypt and Americas show us that these early states (like modern states) were not interested in uncontrollable, illegible and non-taxable production of the society or nature. Early states didn't like self-sufficient and independent communities.

On the contrary; all these states were obsessed with centrally controllable and **taxable production** like grain-based agriculture. Grains like wheat, barley or rice could easily be controlled, monopolized, measured, stored, taxed (in kind) and distributed. Disobedient (i.e. not fully domesticated) or unlawful pheasants could easily be punished by confiscating their harvest (Scott, Pollan, Manning).

The origins of the mechanistic and reductionist worldview should probably be sought in this state mentality. Note that there are lots of similarities between the power seeking state and corporate mentality. For example, modern corporations are generally hostile to self-sufficient sustenance economies like traditional hunter-gatherers, traditional village economies and poly-cultural farming communities that are not dependent on the products, services and technologies controlled by corporations. What can a corporation (or the elites of a state) extract from a community if it is self-sufficient and sustainable?

“**Scientific forestry** in the Saxony and Prussia of the 19<sup>th</sup> century” as explained in “Seeing Like A State” (1999) by James C. Scott is one of the best examples of mechanistic reductionism I’ve ever seen.



Illegible Natural vs. Legible "Scientific" Forests  
(pages 16-17 of James Scott's *Seeing Like a State*)

Scott explains how the mixed (poly-cultural and poly-functional) forests of Europe were reduced to mere timber factories by the state of the era (19<sup>th</sup> century):

“The early modern European state, even before the development of scientific forestry, viewed its forests primarily through the fiscal lens of revenue needs. Exaggerating only slightly, one might say that the crown’s interest in forests was resolved through its fiscal lens into a single number: the revenue yield of the timber that might be extracted” (Scott, 1999).

Note that the correct term today for such kind of monocultural forestry should be **industrial forestry**. And the kind of science which ignores the social and ecological realities (and complexities) of life could be called *industrial science*.

Douthwaite: “Towards the end of the eighteenth century, this only-the-timber-yield-matters thinking led to attempts in Prussia and Saxony to turn chaotic, mixed old-growth forests into predictable, same-age stands, each consisting of a single type of tree (Norway spruce)” (Douthwaite, 1999).

“From the landowner’s (or state’s) perspective, this radical simplification of the forest to a single commodity was a resounding success. It was, however, a disaster for the peasants who were now deprived of all the grazing, food, raw materials, and medicines that the earlier forest ecology had afforded.

But the landowners’ initial success was not sustainable because the complex inter-relationships among thousands of different species, that keep a forest ecosystem alive, were destroyed. As a consequence, already the second generation of spruce grew 20-30% slower than the first.

Moreover, the single-age, single-species stands proved highly vulnerable to damage by pests and to being toppled in storms. The term “Waldsterben” (forest death) entered the German language for the first time.” (Scott, 1999).

Note that **ecological illiteracy** is an important feature of this mechanistic and reductionist (industrial) worldview that reduces a complex forest ecosystem to a mere timber factory. The awareness of complex relationships between different species, and a general knowledge about living ecosystems (food webs, biochemical cycles of nature, animal and plant behaviour, evolution and co-evolution etc.) make such over-simplifications very difficult.

There is probably a two-way relationship between the industrial (mechanistic) and ecological (holistic) worldviews. With its narrow focus on human-made things like buildings, cars, factories, military (monocultural) order and so on, **industrial worldview** diverts the attention from the nature (Kimmerer, 2017), and therefore fosters ecological ignorance. Ecological ignorance is on the other hand a prerequisite for mechanistic simplifications. That is, ecological ignorance makes a sincere belief in abstract mechanistic (industrial) models possible, and industrial worldview fosters ecological ignorance.

### **B.9. Ecosystem Mutilation and Patching Business: Corporations can profit from the destruction of social and biological ecosystems**

Externalities are usually defined as harmful or useful side-effects of economic activities. For example, pollution is a harmful side-effect of many industrial production activities.

Most economy books explain harmful externalities as if they were unintended, unplanned and undesired side-effects. Corporations or states would certainly avoid these harmful effects if this were technically cheap and easy.

Unfortunately, this is not the whole story. Deliberately or not, many companies profit from the harmful side-effects of past business activities.

For example, industrial pollution creates new profit opportunities for industries like water purification, air purification and pharmaceuticals. Ruthless and unplanned urbanization create new revenue opportunities for many industries, including the toy sector (recreational widgets & gadgets), by simply limiting the outdoor playing grounds of children.

Even the climate breakdown (i.e. global warming and desertification) can create many business opportunities for corporations like air-conditioning systems, water dams and reservoirs, water pipelines and so on.

The expansion of the intrinsically unsustainable monocultures in agriculture creates new profit opportunities for global agrochemical corporations like Bayer-Monsanto, DuPont and Syngenta, that sell tons of agrochemicals like chemical fertilizers, pesticides, herbicides and insecticides.

How could we explain this relationship between destruction and profit? What is the big picture?

Note that, we are talking about harmful business externalities that have wide-reaching effects in terms of time and location.

Corporations simply can't earn money from a self-sufficient and sustainable ecosystem. What can you sell for a natural garden pond which is an almost complete (i.e. self-sufficient, healthy and sustainable) artificial ecosystem that doesn't need human intervention?

What can a corporation sell to a traditional (or ecological) farming community which has a closed, self-sufficient and sustainable economy? They don't need any GM seeds or chemical fertilizers, they don't need any pesticides or herbicides, because they have a complete ecosystem for reproduction (i.e. production and recycling) without any gaps at all in the physical and biochemical cycles.

Corporations have three possibilities for selling something to earn money:

1. Discover real uncovered needs



2. Create new (artificial) needs and desires through social engineering (advertisement, media and education)
3. Create new (real) scarcities, needs and necessities through destruction of sustainable communities

Take permaculture gardens as an example, as almost self-sufficient and sustainable ecosystems for producing food. It must be clear that agrochemical corporations should have no interest in promoting permaculture; they would certainly prefer industrial farming based on monoculture as deficient (not self-sufficient and unsustainable) ecosystems, because they can sell lots of equipment, gene technology (GMOs), widgets & gadgets, pesticides and so on, in order to provide short-term solutions for the gaps and deficiencies of the ecosystem.

If these short-term solutions like pesticides cause new problems, hence new needs and necessities by further crippling the ecosystem -in most cases they do- so much the better; corporations can happily offer new solutions for these new needs and necessities. An endless chain of ecosystem mutilation and solution (technology) development means an endless flow of profits. In that sense, technology failure (i.e. unreliability of technology) becomes a reliable profit source.

For an average urban person, whose connection with nature is rather limited, and whose mind is shaped by the modern human-centric, mechanistic and reductionist industrial education, it is very difficult to understand the following fact:

You can't replace the complex biochemical cycles of nature that are based on extremely rich and dynamic (continuously evolving) biodiversity, by intrinsically mechanistic and reductionist human technologies. In other words, you can't compensate for the gaps of an ecosystem with human-made things like tools, machines, computers or chemicals on a sustainable basis. You can't replace evolving live by non-evolving dead matter however smart or intelligent it is.

The long-term strategy of "ecosystem mutilation and patching business" can be formulated as follows:

**Destroy (mutilate) self-sufficient, healthy and sustainable ecosystems in order to create new needs and necessities (hence new profit and monopolization opportunities) so that even clean water or air should become a necessity that must be paid for.**

This destruction need not be intentionally planned with foresight. Also, the destroyer and the profiteer need not be the same persons or organizations. Big investors that control several companies can use them as tools for achieving their own ends, which is generally more money and more economic power. For example, a group of investors can create cancer by selling agrochemicals (i.e. chemical fertilizers and pesticides), whereas the same investor group can sell expensive drugs and treatments against cancer.

This chain of destruction and profit works like a perpetual money machine: ecosystem destruction → new scarcities, needs, necessities and dependencies → temporary (unsustainable) patches with mechanistic and reductionist human technologies → further destruction → further needs & necessities, and so on.

Ecosystem mutilation is about creating artificial scarcity of some goods and services. This can be done in two ways:

1. Destruction of ecosystems physically to create new needs and necessities. For example, creating demand for bottled clean water by polluting local water resources.
2. Ideological manipulation (social engineering). For example, spreading an ideology of economic development and better lifestyle which is only possible with lots of shopping centres, asphalt roads and cars.

Monoculture creates gaps and deficiencies in the ecosystem by destroying the solidarity and balance between different species. Transforming a sustainable polyculture (rich biodiversity) into an unsustainable monoculture (poor biodiversity) is one of the most common methods of ecosystem mutilation. Planned or not, deliberately or not... In most cases, this adverse transformation is promoted as technological progress, efficiency improvement, economic growth and modernization.

Lots of monopolisable technologies like water filters, air filters, GMO seeds and agrochemicals can be sold (generally as short-term solutions that create new chain of problems) in order to compensate for the deficiencies of the ecosystem. This is in effect a business strategy for replacing the easily available and accessible (un-monopolisable) production technologies of nature by monopolisable technologies of corporations.

In order to sell drinking water in bottles, a corporation must first wait until all the available free water resources (produced and distributed by nature) are somehow destroyed or polluted.

If a farm has sufficient biodiversity to keep all the crop pests in check, a corporation must wait until the biodiversity is somehow destroyed, so that it can sell pesticides to kill the pest enemies.

**So, self-sufficient and sustainable ecosystems must first be mutilated (crippled) to create new scarcities, needs and necessities.**

Self-sufficient and sustainable natural ecosystems like natural forests, seas, lakes or coral reefs don't need human intervention (human technologies, human work, human maintenance) for a continuous survival and reproduction, because they are complete, or almost complete, in terms of biochemical cycles, thanks to the rich biodiversity they possess.

More examples: Aquariums and healthcare...

Aquarium companies and shops have generally no interest in promoting natural (low-tech, low-maintenance) aquariums because such aquariums tend to be quite self-sufficient and sustainable, and therefore don't need much technology and human intervention. Aquarium companies and shops like crowded conventional (industrial, high-tech) aquariums, for which they can sell lots of fish, plants and equipment. Promoting big and demanding fish species like angelfish or discus as the height of advanced aquarium keeping is a subtle way mutilating the artificial ecosystem of an aquarium.

Assume, an honest, idealistic and competent government of a 3. world country reduces cancer cases significantly with clever public health policies, like improved environment, lifestyle, physical exercise and nourishment, that prevent many serious diseases including cancer. Do you think, big pharmaceutical concerns would support such governments, or do everything in their power to eliminate them? To be more concrete, do you think, Bayer would support a government which is against potentially carcinogenic Monsanto products (GM seeds and pesticides)?

In fact, the notorious Bayer-Monsanto pair is one of the most obvious and striking examples of ecosystem mutilation from the near history: Monsanto makes cancer, Bayer sells cancer drugs (→ Vandana Shiva's speech in YouTube: [Why we need organic future?](#) about 28. minute)

Ecosystem mutilation and patching business is closely related with parasitic earnings that transfer wealth from local communities and future generations into the hands of a few investors; i.e. just another (but extremely powerful) mechanism for wealth accumulation and concentration.

Becoming aware of the ecosystem mutilation & patching business is not easy for an average city dweller whose mind is shaped by industrial lifestyle education; it requires historical consciousness (i.e. long-term evolutionary thinking) and ecological literacy (i.e. broad holistic view, knowledge about biology, evolution, ecology, anthropology and ecosystems including humans).

There is an interesting article (info box) in “Edible Forest Gardens Vol-1” (2005) by Jacke & Toensmeier, one of my favourite books about ecological agriculture and permaculture, on page 20: Box 1.1: **Shifting the Burden to the Intervenor**

This article is closely related with ecosystem mutilation and patching business. A short paragraph from this article explains, how an addiction to chemical pesticides is created in agriculture:

“A good example of shifting the burden is the use of pesticides in agriculture. A farmer perceives a pest problem and intervenes in the system by spraying chemicals. This kills not only the “target” pest but also other insects and microbes in the soil and vegetation. The ability of the system, to maintain balance and control on its own then decreases. So, another pest problem crops up, the farmer sprays again, and the cycle continues. For a time things seem better. In reality they get worse and worse. More pesticides, and stronger ones, become necessary over time. If the farmer stops spraying, the pests will increase out of control, and he or she will lose the crop, so addiction has set in. It takes time, effort, and understanding to rebuild a self-maintaining system. However, it takes much more effort to keep intervening over the long run.” (Jacke & Toensmeier, 2005)

It is probably not a coincidence that artificial human intelligence (specialist scientific knowledge + artificial computer intelligence) is mostly required in fields like biotech and genetic engineering, that are often deployed in the ecosystem mutilation and patching business (e.g. industrial agriculture with GMOs and pesticides). The reason is, patching business is about trying to replace (or compensate for the loss of) organic intelligence by artificial intelligence.

**Organic intelligence:** The build-in, mostly self-organized, distributed (i.e. not centralized), intrinsic intelligence of a living ecosystem or organism, that shape and control its evolution, together with the entirety of its complex inter-relationships and bio-chemical cycles. For example, we can talk about the organic intelligence of our planet earth for regulating (among many other things) its atmosphere and climate (Gaia Hypothesis). We can also talk about the organic intelligence of a forest ecosystem based on a rich biodiversity.

Social norms, traditions and relations --as products of cultural evolution-- closely resemble organic intelligence; it is complex, distributed and interconnected.

As a variation of ecosystem mutilation & patching business, artificial intelligence (patching technology) can try to replace mutilated social intelligence. For example, by shifting the traditional polycultural, self-sufficient and sustainable farming practices toward monocultural farming in the name of technological progress, economic growth and modernisation (e.g. high-tech digital farming).

Selling “bottled drinking water” is one of the best examples for ecosystem mutilation & patching business. Why is it such a good example? Because it is quite obvious, and relatively easy to understand. That is, not very easy to hide behind a smokescreen of economic complexity.

Can you sell bottled water to a village which has its own clean local water sources like a river or well? No. All these local water resources must be either destroyed –for example, through construction or development(!) projects– or privatized to create the necessity for bottled drinking water.

Once the access of all the local water resources is blocked to the village in one way or another, there will be a new need (i.e. artificial scarcity), and therefore new demand for bottled water. This “demand creation” is the mutilation phase of the business.

Companies like Nestle can now begin to sell bottled water, with the familiar justification that we know from economics textbooks: “we are improving the living standards of the village by supplying them a vital need like clean water”. This “demand coverage” is the patching phase of the business. A

quite convincing argument if one tends to forget the history and evolution of events that created the scarcity of clean drinking water.

From drinking water to irrigation water: Economists or politicians who say “big water dams for irrigation are a necessity” must first ask “what creates this necessity?” As Vandana Shiva points out, Industrial agriculture based on unsustainable monocultures uses 5 to 10 times more water than ecological agriculture (Shiva, 2014; → [video: Earth at Risk Conference 2014, at 7:50](#)).

### **B.10. Blasphemers, Imperialism and DDT**

Even many allegedly critical and heterodox economists seem to think within the limited realm of industrial paradigm, which is actually the realm of business world (firms, households, markets, money, industry, state) that undervalues nature as the primary innovator (i.e. biological & cultural evolution) and primary reproducer (i.e. non-monetary production and recycling).

There are supportive arguments from broad-viewed (multi-disciplinary) economic thinkers like Veblen, Gandhi, Schumacher, Greer, Norgaard, Spash and Shiva.

For example, Veblen said, mainstream (neoclassical) economics is a kind of business ideology (Hunt & Lautzenheiser 2011). Ecological economist Spash argued, even most of the allegedly critical economists were no blasphemers who dare to question the most fundamental assumptions of the mainstream economics, like the utilitarian equilibrium model (Spash, 2011).

Spash: “They (i.e. really critical thinkers Herman Daly, Kapp, Georgescu-Roegen) and like are non-brethren and their **persecution** is a legitimate act in defense of the orthodoxy. Economists who are lauded as part of the establishment (e.g., Nobel prize winners) often have some heretical ideas, but they are not *blasphemers* because they still believe in the fundamental core ideas of the orthodoxy, they protect and defend that core and hold back from pursuing the logic of their ideas to revolutionary ends.” (Spash 2011)

Hunt & Lautzenheiser (2011; page 388) give us some clues about the treatment of blaspheming economists: “If neoclassical economists are asked about vested interests, corruption (which is after all, simply another aspect of free market), economic and political power, or class control of government processes, they reply with disdain that these issues are the concern of sociologists and political scientists (although one searches in vain for such concerns in most conservative, orthodox social science).”

Disdain, contempt, disregard, disesteem as standard tools of social mobbing, exclusion and isolation. Note that these mobbing tools need not always be used with deliberate purposes. In most cases, they might be subconscious reactions (e.g. fear of uncertainty).

Like ecology, **imperialism** (i.e. global exploitation of nature and societies) is another inconvenient subject for neoclassical economics. Economic imperialism, as conceptualized by Veblen, Hobson, Luxemburg or Wallensteiner, was considered an improper subject for the mainstream; not respectable enough for a highly esteemed scientific(!) community (Hunt & Lautzenheiser, 2011).

This logic of thought is interesting; if an issue was perceived as inconvenient and disturbing, it was often stamped as improper, and the existence of it was ignored; simply assumed as non existent.

One of the most common tactics of discrediting and dismissing inconvenient ideas is rendering them as “not scientific enough”, as if all the theories of mainstream economics are based on 100% strong evidence and logic. A new theory, which might replace an old theory, need not be perfect in the scientific sense; it only needs to be better than the older one.

Another common tactic to dismiss inconvenient ideas is, searching for mistakes in details, forms & formalities (i.e. diverting the attention from content and main principles to details and forms) to discredit main ideas. Note that, all these tactics are used by creationists and neoconservatives to discredit the new synthesis of Darwin's evolution theory (Scott, 2004; common tactics of pseudoscience like intelligent design).

Lorenzo Fioramonti, the author of “Wellbeing Economy” says: “According to a research by United Nations & World Bank, 20 largest industry sectors of the world including energy, mining, transport and food production (industrial agriculture) cause much more damage than their total profits.” (Fioramonti, 2017; → [video: The Wrong Economic Trajectory, at 4:20](#))

The question is then, why do such industries exist at all? For what purpose? Certainly not for the good of all humanity; rather for extraction and transfer of wealth (i.e. concentration of military and economic power) into the hands of a powerful minority (billionaires' oligarchy), at the very high cost of hardly reversible ecosystem destruction.

Imperialism seems to be closely related with the patriarchal (masculine) domination mentality; domination over nature and domination over other, allegedly primitive and backward societies. (e.g. The Masculine Birth of Time by Francis Bacon). Domination mentality is in turn closely related with the undervaluation and demonization of other societies, cultures and nature.

In 1950s, DDT based pesticides were promoted with propaganda like “DDT is the symbol of civilization and progress”, and “DDT is the symbol of mankind's triumph in its war against nature” (Silent Spring by Rachel Carson). Such propaganda gives us an idea about the mainstream mindset of the era: Domination (over nature), demonization (of nature) and ecological ignorance...

Rachel Carson: “How could intelligent beings seek to control a few unwanted species by a method that contaminated the entire environment and brought the disease and death even to their own kind?” (Carson, 1962; “Silent Spring”).

My answer to Carson's rhetorical question (“How could...”) would be: Economic imperialism, short-termism and ecological ignorance, that is, **ideological blindness** to the value of nature.

Economic imperialism may deploy both hard power (military force) and **soft power** (i.e. ideological manipulation and deception; value extraction in the cloak of value creation, parasitism in the cloak of mutualism). Both kind of powers, and especially the soft power (i.e. deception mechanisms) can be a product of complex cultural evolution, rather than an artefact of deliberate planning.

Note: Rachel Carson was one of the leading figures of the environmentalist reawakening in 1960s, along with others like Paul Ehrlich, Boulding, Mishan, Holdren and Schumacher (Spash, 2011).

Another factor of **ecological ignorance** could be, as Thorstein Veblen claimed, mainstream economics' reflecting the limited realm of the business world; money, market, companies, human-made goods & services, government, and that's all.

In few words, economic anthropologist Jason Hickel explains so many things (→ [Hickel's related tweet](#)):

Hickel: “Theories of international development that rely significantly on wilful ignorance of **colonial history** and related postcolonial economic arrangements are for the most part intrinsically racist. Why? Because they end up trying to explain global inequality with reference to Western “superiority” (of governance, technology, culture, whatever) rather than a 500-year system of organized net



appropriation from the rest of the world.”

### **B.11. Undervaluation of Government, Undervaluation of Nature**

In her book “The Value of Everything” (2018; → [video: The Value of Everything - making and taking in the global economy](#)) economist Mariana Explains the prejudices and motivations behind the systematic undervaluation of government, since the era of mercantilism. She argues like Veblen, that production and innovation is a social process, in which the government has a big share with its public services like education, and risky investments in many potentially profitable as well as nonprofitable developments.

According to Mazzucato, the ideological undervaluation of government is one of the primary causes of the undeserved (parasitic) earnings of many corporations and investment funds.

For example, many private investors observe the developments that were achieved by government efforts closely, and invest in only the most promising ones (like internet or touchscreen technology), then find various strategies (like private patents) to monopolize on the know-how which was in principle developed first by some public institutions (Mazzucato, 2018).

Thus, socialization of efforts, privatization of profits... Mazzucato's words for such cases: “Value extraction in the disguise of value creation”

This line of thought (by Mazzucato) can be carried further, by asking “why are the valuable services and contributions of the government systematically ignored?”

Because, as Mazzucato explains in detail, the services of the government are undervalued. Since the era of mercantilism, there has been an **ideological blindness** to the value of government among mainstream economic thinkers, also including some broad-viewed heterodox thinkers like Quesnay (Mazzucato, 2018).

Considering the nature of humans (i.e. psychology, sociology), I think, following causal relationship can be generalized for many aspects of life:

**Ideological blindness to the value of X → all services of X are ignored, along with the nature and qualities of X**

Ideological blindness to the value of X: Prejudice, disrespect, contempt, disdain; designations like lower race or culture, inhuman, wild, primitive, backward, undeveloped, chaotic (i.e. without an intrinsic order and intelligence).

There are many examples from the history that support this causal relationship. One of them is about the highly refined, self-sufficient and sustainable polycultural agriculture of the indigenous people of Americas.

Because most of the European colonizers looked down on indigenous people, they were not interested in their achievements or lifestyle. So, they thought, the polycultural gardens they found in North America were just unmaintained gardens or broken forests, and destroyed them all, without even trying to understand their value (Hemenway, 2009). The Europeans were so prejudiced that they attributed zero intelligence to the indigenous people (cultural intelligence of the society), and zero intelligence to the nature (organic intelligence of ecosystems or organisms).

Concepts like **organic intelligence** (as an outcome of biological evolution) and cultural intelligence (as an outcome of cultural evolution, including language, traditions and institutions) is quite central for my PhD thesis.

Organic intelligence: For example, the extremely complex blood circulation in a living organism, which varies properly with varying environmental conditions... We don't know exactly how the blood circulation is regulated, which part of the body takes which role for this regulation etc., but we know that, the organism has all the (organic) intelligence to accomplish such a complex task, among many others.

The same can be said for many complex cycles (water, oxygen, CO<sub>2</sub>, nitrogen, calcium etc.) and complex inter-relationships (among different individuals and species) within an ecosystem, that are necessary for the permanency of the ecosystem. Even if it is a distributed and hardly decipherable kind of intelligence, we can safely say that a sustainable (i.e. more or less established) ecosystem has all the required (organic) intelligence to accomplish all these complex cycles and interactions that are necessary for a dynamic, continuously evolving balance and harmony.

**Cultural intelligence**, that is, intrinsic intelligence in institutions, traditions, language, habits etc. of a society is sometimes very similar to organic intelligence. Even if one often doesn't know exactly, why an institution like a party behaves this or that way (i.e. deliberate planned intent, narrow interests, power relationships, sheer ignorance or unawareness etc.), one can still describe its general behavioural pattern. For example, we can know in advance which parties would protect nature more than others.

In biology, especially in the context of evolution, a behaviour is generally described as if it were a conscious and deliberate behaviour with a certain purpose in mind.

For example, “the male lion kills the cubs of the previous alpha male in order to make the female lions receptive again”. This is but only a convention of language; every decent biologist knows that we don't exactly know what male lion thinks or feels as he kills the cubs of another male. The phrase “in order to make the female lions receptive again” is just an evolutionary explanation of the behaviour; a theory, which might prove wrong in future.

I generally use the same **style of language** for describing the behaviour of societies and institutions. For example, when I write that powerful corporations and business groups (like Mont Pelerin Society, or World Bank) have significant influence on the development of mainstream economics theory, this need not always mean deliberate malicious intent for their narrow interests (i.e. conspiracy theory). In many cases, they might be unaware of their indirect influence. Or in many cases, they might be simply defending their arguments (maybe stronger than others due to some institutional advantages), sincerely believing that their suggestions are for the good of the whole humanity.

Coming back to ideological blindness to value...

I claim with some evidence from the history, and supportive arguments of thinkers like Gandhi, Schumacher (economist), Kimmerer (biologist), Noorgard (economist), Spash (economist), Suzuki (biologist and environmentalist) and Shiva (physicist, agronomist and environmentalist) that industrial paradigm (human-centered, mechanistic and reductionist worldview) fosters an ideological blindness to the value and services of nature.

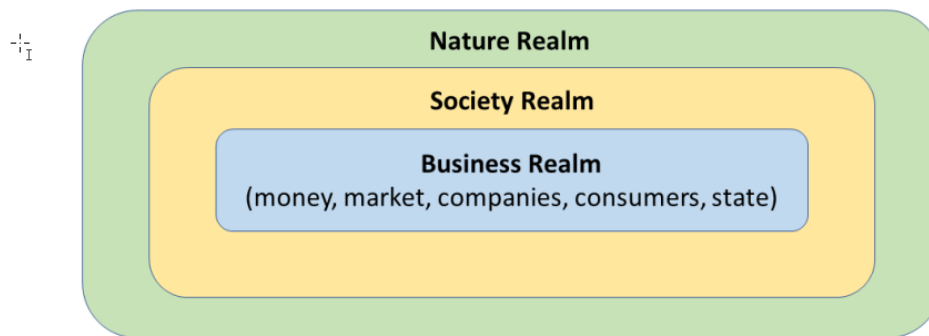
The logical consequence of this ideological blindness to nature is, ignoring its services along with its intrinsic (organic) intelligence.

Mazzucato's argument about the value of government:

The systematic undervaluation of government's services is the natural consequence of ideological blindness to the value of government; i.e. assuming that government is not really a productive institution; just a regulator and facilitator, which may become quite corrupt and nasty if it gets too much respect. As a consequence of this undervaluation, complex social interactions and externalities are ignored along with government services.

Why is Mazzucato different from many other mainstream economists? Because, she tries to think broader, thinking beyond the **boundaries** of the business realm (i.e. industrial paradigm). But not broad enough, because mentally she seems to stay within the boundaries of the society realm excluding the realm of nature. Consequently, she seems to ignore (or undervalue) the primary production of nature (ecosystem services), along with the environmental interactions that are so important for sustainable well-being.

**Figure-5:** Realms of economic life



For example, she talks about **healthcare** as if it were purely a human-made industrial service (drugs, medicines, treatments etc.) that should be provided by the state and private companies. This industrial notion of healthcare is totally disconnected from the preventive services of nature and society, like clean environment, clean water and air, healthy agriculture and food. Consequently, she tends to think, every new cancer drug is a valuable innovation, without making an *historical and evolutionary analysis* about the causes of cancer that created the need for new drugs.

I think like Splash, Schumacher and Norgaard, that economists should be able to see the complete picture, including the realm of nature. That's why Splash talks about “social ecological economics” instead of “social economics”. It must be critically questioned, why economics was defined as a **social science** instead of a multi-disciplinary (holistic) human science that also spans natural sciences.

## **B.12. The Dichotomy of Industrial versus Ecological Agriculture**

In complete analogy with Mazzucato's argument (i.e. undervaluation of state and government), the systematic undervaluation of nature's services (i.e. primary production and recycling) is the natural consequence of ideological blindness to the value of nature. Complex ecological relationships and externalities are ignored along with nature's services based on a rich biodiversity.

This kind of **ecological ignorance** is most prevalent and obvious in industrial agriculture based on unsustainable monocultures, GMOs and agro-chemicals (i.e. chemical pesticides and fertilizers).

Mazzucato criticizes the contemporary method of national accounting (i.e. GDP calculations) in USA, because it tends to undervalue government, and overvalue financial services. She doesn't but talk about the value of nature as the primary reproducer. How is it possible, that even a critical minded economist like Mazzucato forgets to talk about nature's innovation and reproduction?

Probably because, industrial paradigm with its slogans like economic development and technological progress has become the mainstream and dominant worldview; ecological ignorance is everywhere: in education, in science, in economy, in technology, in agriculture, in food, in lifestyle...

So far, I have identified two subject matters where ecological ignorance is most prevalent and obvious (i.e. not hidden behind a smokescreen of complexity): GDP growth, and the dichotomy of industrial versus ecological agriculture...

Vandana Shiva says, "Chemical fertilizer business is based on a science of ignorance (i.e. pseudo-science). They have no idea about the ecosystem of soil, about natural cycles that take place within the soil."

For example, chemical nitrogen fertilizers are often sold as a solution to nitrogen deficiency in plants. But there is lots of scientific evidence, showing that chemical fertilizers destroy the life in soil, and cause groundwater pollution. There are much better and sustainable solutions to nitrogen deficiency like mixed or alternating cropping with plants like legumes that enrich soil with nitrogen compounds.

The dichotomy of industrial versus ecological agriculture is full of such examples showing that natural solutions are in most cases healthier and more sustainable. The problem is, there is not much money for corporations in natural and sustainable solutions.

So, widespread **ecological literacy** has at least three drawbacks for extractive corporations:

1. It makes the costs of environmental externalities too obvious.
2. It makes people aware of the natural solutions; but there's not much money in natural solutions because they are generally based on local, non-monopolistic, open technologies and public knowledge (i.e. no business secrets or patents).
3. It makes people aware of the fact that nature is the primary reproducer (i.e. production and recycling)

### **B.13. The secular religion of economics (economism): Every disturbing idea or body of knowledge is conveniently rejected, ignored, shifted, distorted or belittled**

Introduction of the book "A Guide to What's Wrong With Economics" provides a very good overview to the student reactions and petitions against the teaching of mainstream (neoclassical/neoliberal) economics (Fullbrook, 2002; → [Introduction: Broadband Versus Narrowband Economics](#)).

The movement (**pluralist economics**) has started in 2000 in Paris, with the petition of a handful of economics students pleading for a reform of their economics curriculum. They wanted to escape from imaginarily worlds, and they wanted to have a pluralist and broadband economic education instead of the current narrowband one:

"Most of us have chosen to study economics so as to acquire a deep understanding of the economic phenomena with which the citizens of today are confronted. But the teaching that is offered, that is to say for the most part neoclassical theory or approaches derived from it, does not generally answer this expectation."

“Too often the lectures leave no place for reflection. Out of all the approaches to economic questions that exist, generally only one is presented to us. This approach is supposed to explain everything by means of a purely axiomatic process, as if this were THE economic truth. We do not accept this **dogmatism**. We want a pluralism of approaches, adapted to the complexity of the objects and to the uncertainty surrounding most of the big questions in economics...”

This student movement was quickly spread to other universities and countries. In 2015, 64 student associations from more than 32 countries published an **Open Letter**:

[International Student Initiative for Pluralism in Economics](#) (published at [www.isipe.net](http://www.isipe.net))

What the students wanted can be summarized as follows (Fullbrook, 2007; → Introduction of “Real-World Economics” edited by E. Fullbrook):

1. Economics should become reality based; i.e. not based on unrealistic abstract models and misuse of mathematics (Newton or physics envy) based on flawed assumptions
2. Economics should be problem led, not method led; i.e. not trying to fit the reality to models, not providing only a partial and fragmented view of the object of inquiry (inverse fitting)
3. Economics should (like physics) be **pluralistic**, not monistic; i.e. multiple schools of thoughts, multiple viewpoints for different aspects of life (social, ecological, political...)
4. Economics should be knowledge driven, not ideology driven (i.e. at least, not driven by a single ideology)

Closely related with the issue of “premature mathematization” (in “Small is Beautiful” by E.F. Schumacher), neoclassical theory is largely limited to **quantitative analysis** which is narrowly focused on easily measurable entities like money, quantity of goods and the amount of CO2 emissions. But quantitative analysis alone is not sufficient for studying sustainability (Söderbaum, 2019).

My personal experience confirms Söderbaum’s claim: When I asked an academic at the University of Bern (Switzerland) some questions about the education of economics (in the context of pluralist education) his answer was: “Sorry, I don’t think anybody can help you here, we do only quantitative analysis in our department of economics.” Most interestingly, this academic was an environmental economist by title (→ [my email to University of Bern](#)). He probably believes, *environmental economics* is only about developing quantitative models based on some environmental parameters like the amount of CO2 in the atmosphere.

Economist Katharine N. Farrell: “Georgescu-Roegen argues that their [founders of neoclassical economics like Marshall, Jevons and Walras] aspiration to secure economics a place at the table of the hard sciences [envy for the respectable status of Newton physics] led them to adopt an analytical approach of **arithmetic fetishism** (my words, not his) that leaves unattended the *qualitative aspects* of purposiveness and biodynamic transformation that lie at the heart of economic process: ignoring, thereby, aspects central to defining what constitutes the material requisites of wellbeing, and to identifying viable means on the basis of which these may be attained and effectively [and sustainably] used.” (Farrell, 2019; → [Producing ecological economy](#))

Hence, Georgescu-Roegen implies, arithmetic fetishism is closely connected with *ecological ignorance*; ecological literacy would lead to criticism about the fundamental assumptions of neoclassical theory, and stimulate more qualitative analysis to understand the requirements of wellbeing.

Over-use (or misuse) of mathematics and narrow focus on quantitative analysis have another important function for neoclassical economists; by dedicating the whole attention to analytical issues, they can escape from **contested concepts** like power, institution and ideology (Söderbaum, 2019) that



would require *qualitative inquiry* with potentially conflicting opinions. In that sense, escaping from such many-sided and controversial concepts means escaping from the complex realities of life, and escaping from pluralist discussions, to the noncontroversial, abstract and sanitized models of neoclassical economics.

The use of mathematics in economics is often compared to the successful use of mathematics in **physics**. Donald Gilles, a historian of science and mathematics, argues that there is a fundamental difference: The use of mathematics in physics was often successful, proven by its explanatory and predictive power, unlike the use of mathematics in neoclassical economics (Gillies, 2012)

Gillies: “The use of mathematics in neoclassical economics since 1945 has produced no precise explanations or successful predictions. This seems to me the main difference between the use of mathematics in physics and the use of mathematics in neoclassical economics.” (Gillies, 2012)

Mathematical theories and models in physics are always tested with real-world data. Gillies argues, this crucial process of positive science is generally neglected in neoclassical economics. He gives as an example the prominent book of **Paul Samuelson** [an economist with the Nobel Prize of Swedish central bank] titled *Foundations of Economic Analysis* which is considered a classic of mathematical economics in most elite universities:

Gillies: “If mathematical economists are even to begin to emulate this success [of physics], the first step must be to use mathematics to calculate from their theories results which could be compared to observational data. The extraordinary thing is that Samuelson in his classic book [Foundations of Economic Analysis] does not even take this first step. The book consists, in the 1963 edition, of 439 [356] pages, and almost all of them filled with mathematical formulas, but not even one result is derived which could be compared with observational data. Indeed, there is no mention of **observational data** in the entire book.” (Gillies, 2012)

The other fundamental difference between economics and physics is about commonly accepted versus intensely contested paradigms:

Gillies: “Virtually all contemporary physicists accept relativity theory and quantum mechanics. In Kuhnian terms they share a paradigm. The situation is very different in economics. The economics community is divided into different schools. The members of each of these schools may indeed share a paradigm, but the paradigm of one school can be very different from that of another. Moreover, the members of one school are often extremely critical of the views of members of another school.” (Gillies, 2012)

Most neoclassical economists have a very low opinion of critical (heterodox) economists, and vice versa. Gilles thinks (like Weintraub) that it is very difficult for heterodox economists to obtain an academic post posts in a university. Even if they do obtain such a post, they may be treated badly by their neoclassical colleagues (i.e. mobbing, disdain, belittling...). (Gillies, 2012)

There is yet another difference between **learning physics and economics**. In physics, students learn very early the concept of a controlled experiment, which is a heavily simplified version of the complex real life. For example, mathematical formulas (speed, acceleration, mass, gravity, time etc.) of Newtonian physics that are valid only in a frictionless space... Every student realizes based on her real-life observations that a stone and a feather don't fall to the ground within same seconds if they are released from the same height; this is only the case in a theoretical frictionless environment. In economics however, students (most of whom live in the artificially mechanistic environment of a city) often don't have the possibility to test the abstract theories of economics (like efficient competitive markets) in their daily life. So, they must simply trust the neoclassical economists, and think that whatever models the neoclassical economics have developed and published in popular university

textbooks (and so much respected as a real hard science honoured with Nobel Prizes etc.) must be true.

In his article titled [On the Problem of Formalism in Economics \(2004\)](#), Geoffrey M. Hodgson, a professor in management, refers to a quotation by Mark Blaug (1997, p. 3): “Modern economics is sick. Economics has increasingly become an [abstract] intellectual game played for its own sake and not for its practical consequences for understanding the economic world. Economists have converted the subject into a sort of social mathematics in which analytical rigour is everything and practical relevance is nothing.”

Hodgson explains, how the problem of premature mathematization became even more serious after 1980s (i.e. global spread of neoliberal economics): “Although the victory of **formalism** can be dated to the 1950s (Blaug 1999, 2003), by the 1980s the problem had become much more serious. Because mathematics has swamped the curricula in leading universities and graduate schools, student economists are neither encouraged nor equipped to analyse real world economies and institutions.” (Hodgson, 2004)

Peter Söderbaum (ecological economist): “It has been argued that economics is an established discipline comparable to physics and chemistry and with similar ideas of good science and scientific progress. Economists can refer to a *distinct paradigm*, that is a clear theoretical perspective. The tendency is to stick to this perspective, and today there is a **monopoly position** for neoclassical economics at almost all university departments of economics.” (Söderbaum, 2004; → [The Nobel Prize in Economics; barrier for new thinking](#))

In his article titled [The Rand Portcullis and Post-Autistic Economics](#) (2005), Fullbrook explains how strictly neoclassical/neoliberal **economics departments** of eight prestigious US universities came to dominate the research and education of economics globally (Universities of California, Harvard, Stanford, Yale, Chicago, Columbia, MIT and Princeton). Most prestigious mainstream journals are also dominated by the graduates of these universities. For Fullbrook, it is unsurprising that these departments are seen as distinguished: “The best departments are those who publish in their own journals, which are the best since they publish the best departments.”

Gunnar Myrdal, one of the scholars who received the Bank of Sweden’s Award in Economics, repeatedly argued that values and ideologies are always a part of the research in economics and in other social sciences. This is why, sticking to one and only one (neoclassical) paradigm transforms economy department of universities into political **propaganda centres** (Söderbaum, 2004).

Richard B. Norgaard, an ecological economist, argues that mainstream economics has become a modern secular religion that he calls Economism: “We live in the era of [neoliberal] *Economism*. Human consciousness [and social common sense] is deeply etched by **economistic beliefs** in individualism, materialism, property, markets, economic growth, and freedom as consumer choice.” (Norgaard, 2019; → [Economism and the Econocene: a coevolutionary interpretation](#))

For Norgaard, modern **Economism** is shaped by neoliberal beliefs: “The economy and the problems we have today reflect our past understandings that have been dominated by *neoliberal beliefs* about markets as self-regulating, about the superiority of markets to government, and about how economic growth supposedly advances wellbeing and even brings about environmental protection too.” (Norgaard, 2019)

Like Norgaard, economist Alan Kirman thinks, the institution of mainstream economics has very much the herd mentality of a tribe or church (Kirman, 2019; → [video: Why We Need a Multidisciplinary Economics](#), at 8:50)

For economists like Söderbaum, **pluralistic economic analysis** is about democracy of ideologies. He equates the domination of a single paradigm (or herd mentality) of neoclassical economics to a kind of local dictatorship (or monopoly) within the departments of economics. (Söderbaum, 2019)

Economist-Philosopher Edward Fullbrook (→ [profile](#)) criticises the role of mainstream lectures like Economics 101 with a strong language:

Fullbrook: “Today’s economics, especially **Economics 101**, is a major source of humankind’s denial of the possibility of the calamity of all calamities which our economy is engineering. Annually millions of students around the world are forced to study textbooks that indoctrinate them in to thinking that there is no significant causal connection running from our economy to the ecosphere.” (Fullbrook, 2019; → [Economics 101: Dog barking, overgrazing and ecological collapse](#))

Fullbrook explains, how neoclassical ideology dominated education and research, as follows:

Fullbrook: “From the 1960s onward, neoclassical economists have increasingly managed to block the employment of non-neoclassical economists in university economics departments and to deny them opportunities to publish in professional journals. They also have **narrowed** the economics curriculum that universities offer students. At the same time, they have increasingly **formalized** their theory, making it progressively irrelevant to understanding economic reality. And now (2002) they are even banishing economic history and the history of economic thought from the curriculum, these being places where the student might be exposed to non-neoclassical ideas.” (Fullbrook, 2004)

Since 1970 at the latest, western science has discovered that our economic system was causing fundamental and irreversible changes to the ecosphere. The question is, what has economics done about it? Many critical economists like Fullbrook think “virtually nothing!”. (Fullbrook, 2019)

Fullbrook writes furthermore, that mainstream economics has rather taken a direction of **convenient compatibility**, that is, a direction which converges with the corporations to expand and profit. (Morgen & Fullbrook, 2019; → [Introduction: Economics and civilization in ecological crisis](#))

The British economist Joan Robinson (1903-1983) once said cynically: “The purpose of studying economics is not to acquire a set of ready-made answers to economic questions, but to learn how to avoid being deceived by economist.” (Earle, Moran, Ward-Perkins, 2017; “The Econocracy”, page 157)

In the terminology of economics, the ecosystem is an **externality**, a kind of secondary parenthesis issue, that doesn’t generally enter as a factor into the economic analysis (McManners, 2019; → [Victim of success: civilisation is at risk](#)).

For the founders of neoclassical economics (toward the end of 19<sup>th</sup> century), the global economy was too small to have a global impact on the environment. Even then, negative impacts like polluted air or rivers in and around London or Manchester were obvious of course, but they seemed to the founders small and local enough to ignore them in their economic analysis. “So, economists conceptually **dumped** an economy’s negative effects into a broad category they called *externalities* [as a secondary issue generally considered as exceptions], and today in Economics 101 that is where they remain under the name *negative externalities*.” (Fullbrook, 2019)

Mainstream economics seems to be extremely successful in presenting normalities as exceptions, and exceptions as normalities. Once you have presented externalities as exceptional cases, you need to present ideal (or almost ideal) competitive markets as normalities, and market failures as exceptions in a logical chain reaction. Similar fallacies apply for rational (normal case) and irrational (exceptional case) consumers, or beneficial (normal case) and parasitic investments (exceptional case).

Norgaard argues, the concept of externality is closely related with the privatisation of land. The idea of private property coevolved with the Cartesian (or Newtonian) notion of **atomism** in science, which claimed, nature can be separated into parts without losing anything from the functionality of the whole; just like a machine or factory. As commons were being transformed into private property en masse (through enclosure and privatization), social and environmental connections related to the commons were conveniently ignored and made *external* to the economic thinking right from the start. The science of ecology that see the complex interconnectedness of nature would not evolve for another century (Norgaard, 2019). In that sense, *ecological ignorance* was built into classical and neoclassical economic thinking.

John Maynard Keynes (1883-1946) said: “The ideas of economists... both when they are right and when they are wrong, are more powerful than is commonly understood.” The power of economic ideology makes an indoctrination, that tends to ignore or underestimate the extend of negative externalities, extremely dangerous for the future of the world.

Fullbrook: “We now know thanks to natural scientists [or lay people with common sense], that the longer this **mass indoctrination** into this fantasy world continues, the more likely that the ultimate disaster will happen. It is not only with bombs and gas that crimes against humanity can be committed [e.g. social and environmental disasters caused by industrial agriculture with chemical fertilizers and pesticides, which was promoted as Green Revolution, progress, development, modernisation and economic growth]. Everyone connected with economics, perhaps most of all its students, need to ask themselves what they can do.” (Fullbrook, 2019)

Michael Hudson, another unorthodox economist says: “All historical, sociological and empirical aspects of real life are systematically expunged from the curriculum of economics education, in order to make the mainstream theory unquestionable.” (Hudson, 2017; → [video: Michael Hudson: The History of Neoliberal Economics](#))

When asked by the interviewer “why do mainstream (neoclassical) economists ignore the role of banks and private debt in today's economic system? Are they simply not aware of the flaws in their models?” M. Hudson answers quite boldly: “They are what's called **useful idiots**!” (Hudson, 2018; → [video: Michael Hudson explains Junk economics](#), at 23:55).

For whom are the neoliberal economists supposed to be useful? First of all, for vested business interests. But they are probably useful to themselves too, because, given the domination of mainstream, life appears to be much more difficult for unorthodox economists in academy or government.

Another unorthodox economist Steve Keen, the author of *Debunking Economics*, says: “... economics makes you believe that the ideal system is desegregated markets, and your role is to get rid of all the elements of the **real world** that are different to the text-book.” (Keen, 2018; → [video: How Economics Became a Cult](#), at 2:30)

This is an interesting insight that reminds me the monocultural mindset of industrial agriculture: Get rid of all complex elements of the real world (like biodiversity) that stand in the way by making everything much more complex and unpredictable compared to the simple mechanistic and reductionist model of agriculture (e.g. NPK mentality that reduces soil to a non-living chemical substrate).

Zoologist and environmental activist David Suzuki, formulates the same argument of Keen in a slightly different way: “We always ask nature to fit our flawed economic systems, and it just won't work.” (Suzuki, 2012; → [video: An elder's vision for our sustainable future](#), at 46:00)

William E. Rees is one of the many critical economists, who thinks, mainstream has ceased to work in **scientific mode** long ago: “While natural scientists (like physicists, chemists or biologists) experiment and subsequently adapt their models better to represent reality, economists, particularly those enamoured with the idea of a self-regulating (free) market, would have the real economy adapt to fit their models.” (Rees, 2019; → [End game: the economy as eco-catastrophe and what needs to change](#))

Philosopher-economist Tony Lawson explains this process of **inverse fitting** (i.e. fitting real life to models) as mentioned by Suzuki very eloquently as follows:

Lawson: “Rather than starting with a question about an aspect of social reality and determining an appropriate method, modern economists usually start with a particular type of method and presume, mistakenly, that it must be appropriate to all social contexts. The result is that, in their conceptions, modern economists end up distorting social phenomena just to render them open to treatment by their chosen approach.” (Lawson, 2004)

Lawson: “In any other discipline, they start with a problem and the context, they look at the nature of the problem being addressed, and they design methods to fit the task, the world, the context they’re dealing with. Economists, for the last 60 years, have started from the assumption: This is the method, give me the problem.” (Lawson, 2004; → [Professor Tony Lawson on Economics & Social Ontology](#))

How did mainstream economists come to believe “they have all the tools required to analyse the real-world economy”? One big step for this self-deception was probably reducing the whole economy to **business realm** and *market exchange* (i.e. narrowband economics).

One common way of distorting social phenomena is making unrealistic and untested assumptions like the “utility-maximizing rational consumer” as a model for human behaviour. Another typical way is simply ignoring the social and ecological complexities of life by focusing solely on easily measurable entities like money and quantity.

Trying to fit reality to models, rather than fitting models to reality... One may ask, what kind of science is that?

Unorthodox economists are not the only people who think mainstream economics is a **pseudo-science**. When asked in a TV panel about the role of the “dark science of economics” in climate versus growth discussion, Suzuki says: “First of all, economics is not a science; it is a set of beliefs posing as a science.” (Suzuki, Oreskes, Flannery, 2016; → [video: David Suzuki, Naomi Oreskes and Tim Flannery - Hope for the Planet](#), at 35:17)

How did the mainstream theory and education of economics come to this dismal state? Fullbrook explains three primary factors (among many minor factors) as follows (Fullbrook, 2002)

1. **Mytho-matics** (in Steve Keen’s words): Neoclassical economists have as a group deluded themselves into believing that all you need for an exact science is mathematics.
2. As even J. Stiglitz observed, economics has suffered a triumph of neoclassical neoliberal ideology over science.
3. Today’s social, ecological and economic conditions are very different than the conditions in the 19<sup>th</sup> century, for which neoclassical economics was invented to describe. For example, increased and sharpened consumerism, corporate globalization (World Bank, IMF, WTO), environmental disasters, increasing inequality, climate change, increasing monopoly power of multinational corporations etc. are all relatively new phenomena. Because neoclassical economics has stuck with its original assumptions and worldview, it can explain only a small proportion of the modern economic reality.

How did mainstream (neoclassical/neoliberal) economics come to dominate the policy and education despite all its fallacies and deficiencies?



There seems to be five **primary mechanisms** that explain the domination of neoclassical/neoliberal ideology:

1. Financial and ideological support of vested political and business interests (including neoliberal think-tanks, destructive industries like weaponry, fossil fuels, agribusiness, agrochemicals, biotechnology etc.)
2. Domination in university departments and academic journals since 1960s
3. Effective indoctrination during the undergraduate education in most modern universities as a way of self-perpetuation
4. Urban lifestyle which is disconnected from nature and agriculture, plus industrial education which accomplishes the process of pre-indoctrination (business worldview, belief in the idea of western progress, belief in economic growth, technological fundamentalism)
5. Fake Nobel Prize in economics and mass media (controlled by business interests) for further indoctrination and scientific respectability

Apropos Nobel: Is there really a **Nobel Prize for Economics**? No, there is only a prize of Swedish Central Bank (Sveriges Riksbank) in the cloak of Nobel Prize (Koerth, 2016; → [The Economics Nobel Isn't Really A Nobel](#)). Peter Nobel, one of the descendants of Alfred Nobel (founder of Nobel Prize) said: "Nobel Economics Prize is a PR coup by economists to improve their reputation" (→ [Nobel descendant slams Economics prize](#)).

Even Friedrich Hayek, one of the Nobel laureates in economics (and one of the leaders of neoliberal movement), said: "Nobel Prize confers on an individual an authority which in economics no man ought to possess." In his paper titled [Beautiful Mind, Ugly Deception](#), Yves Gingras explains how the illusion of Nobel Prize for Economics was created as a form of social alchemy.

Many critical economists like Jack Reardon and Bernard Guerrien write about a kind of **adverse selection** in the research and education of mainstream economics: "the recruitment and selection processes for economics teachers and researchers continue to privilege those who demonstrate (particularly in their publications) their knowledge of [abstract] mathematics, thereby perpetuating the situation or even making it worse." (Guerrien, 2004; → [A Science Too Human?](#))

Sociologist Kyle Siler writes, neoclassical economics is so obsessed with abstract analytical models that proficiency in mathematics, however relevant or not with real life situations, has become a matter of social prestige and professional hierarchy in many departments of economics (Siler K, 2003, → [The Social and Intellectual Organization and Construction of Economics](#)).

Silja Graupe, a German professor of economics, explains the problems of mainstream economics (and solutions to them) by analysing the question of **epistemology**:

Greta Thunberg's words ("how dare you?") were repeated at the WWF conference for Rethinking Economics (→ [www.aufzuneuenuefern.org](http://www.aufzuneuenuefern.org)) by Graupe (→ [video: Keynote von Prof. Dr. Silja Graupe](#)).

But before coming to the message of Thunberg, Graupe tells how she had heard the same phrase "how dare you" about ten years ago in a totally different, one may say in a just opposite context. One of her academic colleagues submitted a critical (unorthodox) paper about the financial crisis in 2008 to a prestigious journal of economics in USA. Within 25 minutes she received following response from the editorial office of this journal: "How dare you!"

Gaupe thinks, three main pillars of sound economic thinking, namely "**application** (policy development and implementation, practical work; how do we reach our main goals), **morality** (what are main goals of economic policies) and **science** (theory and education)", came apart in the mainstream education, lost their connections and coherence due to completely misleading foundations

(i.e. fundamental assumptions) of mainstream economics. She talks about concepts like mental infrastructure, mental pathways and epistemicide.

**Epistemicide** is about extermination of certain (generally unfavourable, inconvenient, disturbing) knowledge systems (i.e. knowledge sources, ways for obtaining knowledge, or different fields or bodies of knowledge).

In the case of mainstream economics, epistemicide (as I understand) boils down to ignoring, underestimating or downplaying inconvenient bodies or sources of knowledge like ecology, which makes the social costs of environmental destruction (i.e. environmental externalities) too obvious for students and lay people. Ecology as a body of knowledge is inconvenient for a mainstream economist (or student) because it causes conflicts with the sanitized worldview of mainstream economics (functionally-benevolent business realm) and the idea of “efficiently allocating competitive markets”.

As Neva Goodwin writes: “This (the possibility of market failures) makes mainstream economists squeamish about admitting to externalities, since the optimality of market outcomes is one of their main boasts, and they don’t have an alternative theory to pull out of the hat.” (Goodwin, 2019; → [Addressing meta-externalities](#))

Graupe claims, once the mental infrastructure is established in the young brain of a student, along with deeply engraved mental pathways for the general analysis, it is extremely difficult for the student to overcome all these ingrained constraints to take different pathways for thinking and learning.

In line with Graupe, many unorthodox economists like Steve Keen (author of *Debunking Economics*) talks about **indoctrination** in the education of mainstream economics:

“Finally, in honours, master’s or PhD courses, they study the full exposition given below, and finally learn that the aggregation of individual demand is valid only under patently absurd conditions. However, by this time the indoctrination into the *neoclassical mindset* is so complete that most of them cannot see the absurdity.” (Keen S, 2011, page 42)

Graupe underlines, what we learn and how we learn depend on our motivation (**purpose**); what do we want to achieve with the information we have obtained? This is exactly why the moral dimension of economics is so important. Why do we learn economics at all? In order to develop and implement policies for the general wellbeing (sustenance, security, equity, happiness, meaningful life, self-realization etc.), or for economic growth (as an illusory proxy for wellbeing), or just science for the sake of science, that is, pure (sanitized) science isolated from all moral and practical aspects of life?

The training of the indoctrination (i.e. building rigid mental infrastructures) is a process that happens in most cases subconsciously for both the teacher and the student. Graupe says, we must somehow make these normally invisible **mental infrastructures** visible in order to change them if necessary. She thinks, this process of enlightenment, that is, the escape from narrow and rigid habits of thought (in V. Shiva’s words “monoculture of the mind”) requires fostering in education:

1. Critical common sense; the ability to question one’s own convictions if they are in conflict with reality, rather than ignoring or downplaying the warnings of reality to conserve established convictions
2. Moral competence; ability to make sound moral (ethical) judgements
3. Creative and dialectic imagination; developing ideas in dialog with other people, and in dialog with theory and practice to make sound judgements about practical applications

Some economists like Söderbaum or Fullbrook use another term for indoctrination: **Cognitive inertia**. The solution for cognitive inertia is for them again pluralist discussion: “The close to monopoly position of neoclassical theory and method at university departments of economics and elsewhere needs, as a first step, to be replaced by pluralism. The cognitive inertia of neoclassical economists,

emphasizing one thinking pattern at the expense of all other possibilities can be referred to as *narrative fixation* (ideological fixation).”

Coming back to GDP, John Bellamy Foster writes: “The notion (illusion) of growth dominated politics only after the second world war. There was no talk of *economic growth* before.” (→ [video: What every Environmentalist Needs to Know about Capitalism](#))

In terms of the critical dimensions mentioned above (practice, morality, theory) and the history of economic thought, I think, we can roughly talk about **four periods since Adam Smith**:

1. Classical period: From Adam Smith (1723-1790) to 1870, all these dimensions were incorporated into the politics of economy, even though ecological aspects were often ignored due to lack of daily experience and knowledge in this field. As an important milestone for understanding ecology, *Origins of Species* (evolution by natural selection) by Charles Darwin was published in 1852.
2. Neoclassical period before GDP: 1870 to 1950, economic theory was sanitized from practical and moral aspects of the politics of economy through intensive misuse of mathematics (physics and Newton envy); a kind of esoteric science for the sake of science in the name of objective analysis. The situation became even worse after the death of Keynes (1883-1946); especially in the second half of his career, Keynes was strongly against premature mathematization in economic theory.
3. Neoclassical period after GDP: 1950-2008, erroneously used as a proxy for wealth, progress and wellbeing, GDP growth has become the ultimate purpose of economic policies.
4. Period of confusion (searching ways for a better economic education): 2008-today. Though mainstream majority (economic orthodoxy) is quite oblivious to critique and resistant to change, relatively perceptive economists and students of economics, and even many lay people (especially eco-socialists and environmentalists) became increasingly aware of the fallacies of mainstream economics, and dangers of economic policies based on economic growth (i.e. dangers of business as usual).

Having semantically equated economic growth (GDP growth) to wellbeing, most mainstream economists dedicate their whole attention directly to (sustainable) economic growth, thereby bypassing the ultimate goal of wellbeing and **confusing means with ends**, with disastrous consequences for many states and countries of the world. Many socially and ecologically destructive projects (like dirty industries, industrial agriculture, dirty energy and mining, huge water dams) are promoted, imposed (often by WB and WTO) and justified in the name of economic growth.

Economist Neva Goodwin writes: “Among many problems with current uses of GDP, they are used to support policies that *emphasize growth in throughput over increase in wellbeing*. They ignore the contributions of unpaid workers (especially women, especially but not only in household work) as well as the cost of environmental damage –unless that damage requires *compensatory activity*, in which case it is listed as an addition to GDP.” (Goodwin N, 2019)

A **narrow pursuit of economic efficiency**, like the GDP, is often employed as the highest goal of economic policies. McManners writes: “It is exceedingly hard to convince mainstream economists that the ecosystem should be protected and conserved using higher order principles (i.e. higher goals) to frame the economic analysis. Environmentalists can be accused of being unworldly dreamers, when in fact it is the economists who continue working on the assumption that the ecosystem will remain intact by default, who are in cloud-cuckoo land.” (McManners P, 2009, → [Victim of success: civilisation is at risk](#))

Neoclassical economics is inclined to measure everything with money. As discussed above, the concept of GDP reduces the whole production of an economy (with monetary and non-monetary components) to monetary production only. Such kind of **monetary reductionism** is also employed in the Cost-Benefit-Analysis (CBA) (Söderbaum P, 2019).

Söderbaum: “In neoclassical **Cost-Benefit Analysis** (CBA) actual market prices and a kind of hypothetical market prices are used to transform non-monetary impacts of various kinds to the monetary dimension. Even different non-monetary dimensions are traded against each other in this way. Those indoctrinated in the neoclassical paradigm tend to see the mentioned simplification of analysis as smart and elegant.” (Söderbaum P, 2019).

A more holistic and multi-dimensional approach, with monetary flows and positions as well as non-monetary flows and positions, are required, instead of attaching a monetary value to every kind of economic, social and environmental impact (Söderbaum P, 2019).

Attaching a **monetary value** to every kind of impact requires a blind faith in assertions like:

- Money can buy, substitute or repair everything, including the loss of biodiversity
- With sufficient money (investment), one can develop *advanced technologies* that can solve every kind of social and ecological problems, including depleted resources and pollution (technological fundamentalism)
- There are no irreversible losses, that is, no irreversible processes, unrepairable or irreplaceable resources in our economic system (implies a lossless and frictionless perfect circular flow as often shown in GDP flow diagrams)

Economist Katherine N. Farrell also criticises this kind of monetary *real cost estimations*:

“The persistence of such work [done by environmental and ecological economists] illustrates the momentum of **arithmetic fetishism**, in which processes that do not easily lend themselves to quantification are arithmetized for the purpose of forcing them into the existing, quantitative analytical rubric [i.e. again, fitting reality into abstract models]. It is, I would posit, largely a waste of time and resources, as the resulting data are not only meaningless but also distracting.” (Farrell KN, 2019)

Farrell argues further, that we need to manage the transition from a mechanically based operating system to a biologically based one. This requires first of all strong interdisciplinarity and a posture of *humility* in front of the life-giving and self-organising capacity of the natural world “which modern **industrial science** has yet, for all its achievements, to replicate.” (Farrell KN, 2019)

Without the necessary humility and respect for nature, science would continue to work in the domination mode in the name of progress and development, with the rhetoric of “our war against nature” (Vandana Shiva).

Many scientists, economists, and lay people with a healthy common sense think, we don’t need growth, efficiency and expansion; we need first of all social cohesion and ecological stability for the ultimate goal of sustainable wellbeing.

McManners: “Abandoning the growth objective leaves economists struggling to know what to do. We need nothing less than **reframing economics** for the 21<sup>st</sup> century.” Sustainable wellbeing, hence social and ecological goals should have priority over narrow economic goals like efficiency, or output maximization. (McManners P, 2009)

For McManners, reframing of economics should fulfil two purposes: (1) Bring economics back under the umbrella of higher-level objectives and aspirations. (2) Set up economics as the enabler of high-level policy. That is, economics should be a policy enabler, not a policy driver with misleading high-goals like GDP growth or efficiency.

McManner thinks, the conventional sequence of policy development must be reversed: “Applying the old 20<sup>th</sup> century economics involves crafting an economic and business case. Once completed, the case is subsequently subjected to social and environmental impact assessments. This sequential

approach reinforces the dominance of economics and ensures that long-term overexploitation of resources and environmental damage is almost inevitable. Positioning the social and environmental analysis at the front of the process, sends the economic analysis down a different track.” (McManners P, 2009)

Economic success today (in the narrow unsustainable sense) should not be obtained at the expense of future generations. Not only climate scientists but even economists like McManners warns that a potential collapse (i.e. series of serious catastrophes) is not a long-term issue anymore; it may hit humanity within two or three decades, within the lifetime of our children. We need policies that respect (1) planetary boundaries, (2) the rights of future generations, and (3) higher ethical goals like global equity and basic human rights like food and health.

Katharine N. Farrell is one of the many heterodox economists who think **strong interdisciplinarity** is required to develop policies to reach higher goals within the planetary and social boundaries:

Farrell: “In contrast to subsuming knowledge from other disciplines to serve the ends and means of conventional modern economic analysis [like economic growth], as is done, for example, in the fields of neuro-and behavioural economics [also in environmental economics], this implies situating economics [only] as a contributor [i.e. as policy enabler, not policy driver] toward the collaborative project of developing multi-dimensional, complex representations of the social-ecological relationships and processes that both underlie and are impacted by late-industrial economic activity.” (Farrell KN, 2019. → [Producing ecological economy](#))

As Kate Raworth writes in Doughnut Economics, if the **ultimate goal** of all economic policies is not openly and explicitly discussed in economics (by pretending to be an objective, mathematical hard science like physics), it will be hijacked by vested business interests, and ultimate high goals like “sustainable wellbeing for all” will be replaced by narrow business goals like economic growth. With the support of mass media and education, this process of mental distortion can reach such levels that many people may come to believe that economic growth (and protecting their consumerist life-style) is more important than the health of the planet (Oreskes N, Conway E, 2014).

**Lack of historical consciousness** (i.e. not being aware of the revolutions and long-term changes like biological and cultural evolution) is another deficiency of mainstream economics. Many academics and critical economists think, mainstream economists and students are not literate enough because they don't study subjects matters like history of economy, history of economic thought, history of civilizations (anthropology and cultural evolution) and history of nature (ecology and biological evolution) properly.

The consequences of this **historical illiteracy** combined with the narrow focus of mainstream economics that reduces economy to the business realm (firms, households, consumers, market, money, goods & services, state) can be summarized as follows (Foster JB, Clark B, York R, 2010, → The Ecological Rift):

1. Myopic view to economy without past and future; fosters short-term thinking like many politicians and profit-oriented corporations
2. Myopic view to economy in terms of geography, nature and society; inability to see complex socio-ecological relationships and wide-reaching consequences of economic activities
3. Blind belief in the present economic system (incl. free market, progress and growth delusions), as if it is a law of nature, as if there was no other/better system in the past, and there can be no other/better system in the future, even if the present system is not ideal.
4. No history of economic thought means, rival ideas and theories that conflict with the mainstream paradigm (i.e. neoclassical/neoliberal economics) are ignored.



“A narrow spectrum of time in which social [and ecological] conditions have seemed to be relatively stable is frequently translated into a set of permanent conditions” and consequently these conditions disappear from the economic analysis since they are rationalized as [secondary] **background conditions**. “In conventional economic analysis, fundamental social [and ecological] relations are relegated to the category of background conditions, which are assumed to remain constant over time.” (Foster JB, Clark B, York R, 2010)

The dehistoricization of society and the dehistoricization of nature go hand in hand. Today, social sciences and humanities (i.e. economics, political science, sociology, anthropology, philosophy and cultural sciences) are marked by their separation from nature (ecological Apartheid), and particularly from history of nature (evolution).

In **conventional history** for example, all significant aspects of history like kingdoms, states, wars, lifestyle, culture etc. are explained without any reference to the environmental conditions of the era, as if humans shaped all important aspects of the world around them, and became totally independent of their environmental conditions through their cultural and technological ingenuity. Or as if, the environmental conditions didn't change much during hundreds and thousands of years.

In any case, environmental conditions like climate, soil, biodiversity etc. are reduced to secondary background conditions in conventional history. The dominant (mainstream) anthropocentric ideology is, human culture dominates and shapes the nature, not vice versa. The erroneous assumption is, cultural evolution does not depend on environmental conditions (i.e. there is no co-evolution of culture and nature; human culture shapes all the significant and relevant aspects of nature).

Note that this myopic view to time, geography, society and nature is closely correlated with dogmatic convictions like growthism (i.e. belief in limitless growth), continuous linear progress (in Western history) and technological fundamentalism (i.e. technological progress can solve every social and ecological problem).

For example, if a student is not aware of the wide-reaching consequences and side-effects (i.e. externalities) of allegedly “modern and **advanced technologies**” like GM seeds, artificial chemical fertilizers and pesticides, she will tend to believe that technological progress can solve every problem in the world. A student who studies history will understand that many technologies that were initially promoted as the “ultimate silver bullet solution, symbols of progress etc.” (like DDT based pesticides or chemical fertilizers) did nothing than shifting and expanding ever-growing social and ecological destruction into the future, and into other dimensions of life (K. Marx, J. B. Foster).

We know today that many **highly-profitable technologies** are extremely destructive, and they are only short-term solutions developed to fight and suppress symptoms, rather than to cure the underlying real disease as a permanent (sustainable) solution (Foster JB, Clark B, York R, 2010). The tragedy of DDT is again a good, demonstrative example (→ Silent Spring by Rachel Carson). In many cases, like sustainable ecological agriculture that regenerate soils, sustainable social and ecological solutions are not aligned with the interests of many corporations, because there is no money in non-monetary social and ecological solutions (→ defensive/repair costs due to socio-ecological destruction, Lauderdale Paradox).

It must be quite understandable that neoliberal ideology doesn't like historical consciousness, because even the most simple and fundamental assumptions like **free exchange** (a fundamental requirement of free market) can't stand much to the critical analysis of a historical mind.

For example, consider a consumer buying voluntarily a bottle of drinking water from the market. If he is just focused on the present time and conditions, everything about this purchase is free. He is buying the bottle voluntarily, and he has the choice among several brands of bottles (i.e. competitive market); a single brand does not monopolize the market of bottled drinking water.

The danger is, what if asks, why is he obliged to buy drinking water (with money) at all? How was it 20 years ago, 50 years ago, or 100 years ago? Did people always pay money for drinking water? If not, how did it happen that we all have to buy drinking water today?

By asking such dangerous questions, he will soon find out that drinking water has become a scarcity, hence very profitable business (→ [ecosystem mutilation and patching business](#), Lauderdale Paradox, defensive/repair expenditures), due to the social and ecological destructions in the past (meta externalities); destruction of nature, pollution, crowded and dirty cities as the natural consequence of the destruction of local village economies, and so on.

Considering the history of such events, he will begin to ask if his purchase was really a free exchange, or was it in reality a **compulsory exchange**? After all, he must drink water to live; he has no choice like “not buying water” or buying a substitute for water.

He may even think further, and ask following, even more dangerous question: What is the real competitor of a company that sells bottled water? Other companies, or nature, or social organizations, that provide drinking water for free? If nature (as the primary producer) and social solidarity are the primary competitors of a company in the context of drinking water, in what other contexts do companies see socio-ecological cohesion and harmony as their primary obstacle to easy profits?

As this example illustrates, ecology + history is a very dangerous combination for the neoliberal ideology. It is not without a reason that neoliberal business interests (i.e. economic elites) and neo-conservatives conspire to call environmentalists as the new red (Gorre, 2019; → [Green Is the New Red: The Metamorphosis of Communism](#)).

Similar anti-ecology propaganda can be found in one of the most popular economics textbooks “Principles of Economics, 7<sup>th</sup> Edition” by Gregory Mankiw (implying these stupid environmentalist “whose means betray their own ends”, in the chapter for externalities).

Propagating the neoclassical worldview of economics together with the neoliberal anti-environmentalist propaganda was apparently quite profitable for Mankiw: “It has been estimated that Gregory Mankiw has earned royalties of \$42 million from his *Principle of Economics* textbook, which is in its seventh edition, and has sold over a million copies...” in [The Econocracy](#) (2017).

When Satish Kumar, an Indian-British philosopher and founder of Schumacher College visited the London School of Economics (LSE), he asked justifiably “Why don’t you have a department of **ecology**? Don’t you know that both words, namely ecology and economy are derived from the same root oikos which means household?” (Kumar, 2013; → [video: Education with Hands, Hearts and Heads](#))

Despite all critique since more than 50 years (for example, *Small is Beautiful* by E.F. Schumacher), mainstream economics failed to integrate ecology into its scope of analysis by sticking to its narrow business realm (human economy of industrial paradigm) and mechanistic-reductionist worldview. Not only ecology; mainstream economics also failed to integrate important discoveries of thermodynamics, complexity and chaos.

The **second law of thermodynamics** tells us that many ecologically relevant flows through the economy are unidirectional transformations of energy and matter. That is, they are not circular or reversible flows as depicted in the circular money-and-goods diagrams of mainstream economics. Many real-life economic processes like loss of biodiversity, pollution, depletion of oil reserves etc. are not reversible in the short-term by human action or technology. This insight has very important implications for making judgements about sustainability. A circular flow diagram seems to function for ever, but the reality is very different (Rees, 2019, → [End game: the economy as eco-catastrophe and what needs to change](#)).

“As Georgescu-Roegen tried unsuccessfully to impress on fellow economists, an expanding economic process is ultimately self-destructive; it feeds on useful energy/matter *produced by nature*, and returns it to the ecosphere as useless waste (which increases the entropy of the planet). A should-be-obvious corollary of second law is that all economic *production* is mostly consumption.” (Rees WE, 2019)

Why can't students see more comprehensive flow diagrams in their standard textbooks, with entities like nature, society, (often toxic) waste matter, mineral and energy depletion, entropy?

“Because of second law inefficiencies, the bulk of the energy/matter that enters the production process is emitted almost immediately as (often toxic) land air or water pollution; only a small fraction is embodied in marketable goods and services (and even this eventually joins the waste stream). Again, without reference to this *one-way entropic throughput*, it is virtually impossible to relate the economy to the environment, yet the concept is virtually absent from economics today (Herman Daly).” (Rees WE, 2019)

**Complexity theory** tells us that the interplay of the relatively simple laws of physics, chemistry and biology can produce extremely complex and nonlinear, and therefore inherently unpredictable system behaviour. Even without the complexity theory, our common sense tells us that nature is very complex and full of surprises. (Rees WE, 2019)

Complexity theory have two important implications for economics:

First, we can't predict the behaviour of natural ecosystems by simply analysing the behaviour of its parts (mechanistic and reductionist approach), because complex systems like ecosystems or societies have emergent properties and emergent behaviour. For example, one can't predict the behaviour of a school of fish by just analysing the behaviour of individual fish.

By the example of an eye cortex, Prof. Robert Sapolsky explains where westernized reductionism begins to fail: Complex (and nonlinear) biological systems (→ [video: 21. Chaos and Reductionism](#), at 19:40)

Second, persistently accumulating small influences (like toxic waste) to a complex natural system may suddenly cause dramatic changes (i.e. catastrophe) in the system, and may tip the whole balance to extreme conditions in which human life is not feasible anymore.

“**Catastrophe** occurs when a key system variable, driven by some persistent pressure, is displaced far from its usual attractor (convergence/balance point). ... Most significantly, the new domain may be hostile to human interests and there is no guarantee that the system will ever return to its former state.” (Rees WE, 2019)

Typically, a relatively simple **lake ecosystem** will endure much assault and waste without showing obvious symptoms of degradation; but only up to a certain level of endurance. Once some key species that are crucial for the food webs begin to die, the whole ecosystem will collapse in a relatively short time. After the collapse, one will be confronted with a much poorer, much less productive, and much more instable ecosystem. One can observe similar phenomena in an aquarium. Hence, 100-years of endurance is no guarantee for 101-years of endurance for a natural ecosystem.

If neoclassical economics has so many flaws and illusions, what shall we do with it? Throw it to the dust bin of history?

Economists like Söderbaum think that would be a mistake, because we should not be looking for an ultimate correct theory, an ultimate conceptual framework that would replace the neoclassical one, in the sense of a formal paradigm shift (Kuhn T, 1970). What we need is **pluralist, multi-dimensional and multi-disciplinary (holistic) inquiry** with different ideologies, different priorities, different

viewpoints and different schools of thought, including the neoclassical one. Besides, one perspective may help to improve the understanding of another one.

In that case, one is tempted to ask questions like “in what kind of contexts would neoclassical economics be valid, relevant and useful? Is there really such a case with ideal competitive markets and utility-maximizing rational consumers in real life?”, or “will learning neoclassical economics really help understanding other approaches and schools of thought, or will it rather be an obstacle due to rigid indoctrination?”

My opinion is, learning neoclassical economics will probably not be a rigid indoctrination if the student already has a **solid background** in areas like philosophy, history of nature (evolution), ecology, sociology, anthropology (human history and cultural evolution) or history of economic thought. But if the student doesn't have the necessary background to make various cross-checks and ask critical questions about the fundamental assumptions of neoclassical economics, the danger of indoctrination may become significant.

This is probably why, many economics departments are so reluctant to add such interdisciplinary broadband lectures to their curricula; it may lead to critical thinking, and hence, questioning the dominant paradigm taught in the department. This is like teaching the modern synthesis of Darwin's evolution theory in a school where intelligent design (i.e. creationism in disguise) is the dominant paradigm.

Economist Alan Kirman: “We should be taking into account anthropology, sociology, biology... in economics” (→ [video: Why We Need a Multidisciplinary Economics](#), at 4:00)

Economic historian Robert Skidelsky explains why learning the **history and philosophy of economy** is essential to critically question the methods, purpose and direction of economics (→ [video: What Is Economics About? How & How NOT to Do Economics](#)).

Skidelsky claims, there are two primary reasons of mainstream economists' resistance to change (i.e. cognitive fixation to even contested/flawed methods and models): (a) internal reasons; ideological fixation to mainstream paradigm in science as Thomas Kuhn explained in his book “The Structure of Scientific Revolutions”, and (b) influence of political power (ruling class); how people in power would like economics to be done. Skidelsky also explains, how the discipline of economics (with neoclassical influence) traded “breath of understanding” for “sharpness” (i.e. perceived objectivity and certainty) in a narrow field, by replacing narration (qualitative analysis) by mathematics.

An important discussion in the history of economic thought was about the concepts of **use value** (wealth) and **exchange value** (market value, price).

For the classical economic thinkers like Smith, Ricardo, Mill and Marx, it was very important to understand the source of real material wealth (i.e. use value of materials). That's why, they were very careful about differentiating use value from exchange value. They were quite aware of the fact that an abundant material resource like water, soil or air, that we find in nature for free, may have great *use value* even if it had no exchange value (i.e. market value) at all.

The distinction between **use value and exchange value** was but dropped with the advent of neoclassical economics. Neoclassical economists cared only about exchange value (price in the market). That is, they equated wealth to money (consciously or not), just like they equated wellbeing to economic growth (consciously or not). This kind of monetary reductionism had the consequence that, all the things that we find in nature for free were considered as free (valueless) gift, because value (as well as wealth) meant only exchange value for neoclassical economists. (Foster JB, Clark B, York R, 2010)

Designating the resources of nature as **valueless gifts** further reduced the perceived value (and importance) of nature in the eyes of mainstream economists. In stark contrast, William Petty (1623-1687), a philosopher, scientist and economist, who could distinguish use value from exchange value said: “labour is the father of material wealth, the earth is its mother.” (Foster, Clark, York, 2010, page 63)

#### B.14. Fragmented and corrupted science & education

Modern (industrial) science and education have three fundamental problems:

1. Human-centred, mechanistic and reductionist worldview (→ [industrial paradigm](#)) which is the cause and consequence of over-specialization
2. Over-specialization: Narrow and fragmented scope of scientific knowledge with rigid disciplinary boundaries; a situation that reflects the high level of specialization and labour-division on the modern industrial economy.
3. Corruption; the corrupting influence of vested business interests and political power

**Over-specialization** in a narrow field often comes at the expense of holistic and integrated overview (i.e. the ability to see the complete picture). Over-specialization in education and at work can also make people numb, weary and unhappy (A. Smith, E.F. Schumacher). For critical thinkers like Vandana Shiva, the problem of over-specialization is closely related with *monoculture of the mind*:

“The **monoculture of the mind** treats [every kind of] diversity as disease and creates coercive structures to remodel this biologically and culturally diverse world of ours on the concepts of one privileged class, one race and one gender of a single species.” (→ [Tackling Monoculture of the Mind](#) by Vandana Shiva)

Naomi Oreskes, one of the authors of *Merchants of Doubt*, explains, how over-specialization can inhibit the understanding of complex and multi-dimensional subjects like **climate change**:

Oreskes: “Modern science has been constructed in a very balkanized, fragmented way with rigid disciplinary boundaries. You can study (a branch of) chemistry and not know how old the earth is. You can study genetics and not know much about evolution. You could be a physicist and know nothing about the interconnections of life [like most economists]. To address the problem of climate change we have to look at the interconnections.” (→ [video: David Suzuki, Naomi Oreskes and Tim Flannery - For Thought: Hope for the Planet](#), at 3:45)

Understanding the causes and impacts of climate change requires an integral overview to many disciplines, but most scientists, who are used to think within their disciplinary boundaries are overwhelmed by the task. It might be better to develop the ability to see the interconnections at the expense of reduced expertise in a particular discipline. That is, more holistic inquiry at the expense of reduced specialization (i.e. the resurgence of holistic science) (N. Oreskes, V. Shiva)

Specialization, in combination with division of labour, is often praised by mainstream economists in the name of industrial efficiency. There are but social, psychological and ecological **limits to specialization**.

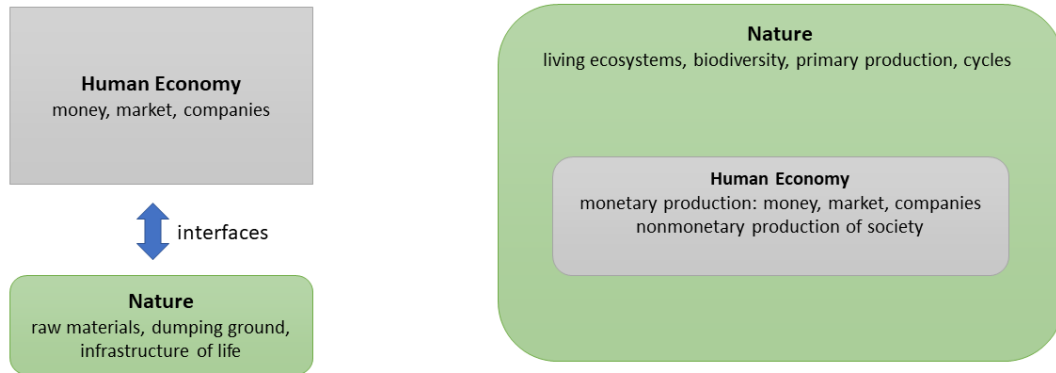
In his article titled [Economism and the Econocene](#), economist Richard B. Norgaard tells the history of social transformation from nationalism to economism as follows:

As scientists like Svante Arrhenius were trying to understand the environmental impacts of human economy due to greenhouse gases, “the vast majority of theoretical scientists were busily digging deeper, narrower strands of knowledge, that occasionally other more applied but still specialized scientists and engineers were turning into technologies that were profitably introduced into human and natural environments, with little if any concern for their larger consequences. How could they be



concerned given their **fragmented training** and lives in specialized organizations of specialists who also were oblivious of larger systems?” (Norgaard RB, 2019)

## Industrial versus Ecological Paradigm



Tunc Ali Kütükcüoğlu - [www.tuncalik.com](http://www.tuncalik.com) - July 2019

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Whatever the stated and intended purpose, the real function of modern **industrial education** is producing for lucrative corporate and government posts tamed specialists who don't ask inconvenient questions about big picture, purpose and meaning (Lasch C. 1995, Warburton N. 2012). That Nobel praised scientists work for exploitative companies like Syngenta and DuPont demonstrates, how effective industrial education is for its own purposes (→ [AufKostenAnderer.org](http://AufKostenAnderer.org)).

Social cohesion, political dialogue and democracy suffers when people are educated only about their jobs, and remain largely ignorant of the general philosophical, political and practical issues of life (Lasch 1995, → [The Revolt of the Elites](http://TheRevoltOfTheElites.com)).

In the agriculture for example, one may be tempted to specialize on a single crop like maize in the name of efficiency. Monocultures are but, in most cases, ecologically unsustainable because they cause soil degradation within a few years. This example can be generalized: Too much specialization and too much efficiency (i.e. efficiency in the narrow sense) can overwhelm the ecological carrying capacity of the ecosystem.

In our modern urban life, over-specialization and **industrial paradigm** often conspire to make nature (hence ecology) virtually invisible. As Economist W. Rees writes, mechanistic and reductionist worldview is not a peculiar feature of economists; it has become the *social common sense* through urban lifestyle and industrial education:

“Our dominant econo-cultural narrative of *perpetual growth and ever-progressing technology* sees the **natural environment** as little more than a static aesthetic backdrop to human affairs. It relies on analytic models based on reductionist assumptions about resources, people, firms, and technology that bear little relationship to their counterparts in the real world; in effect, society views the economy as a separate system functioning independently of the ecosphere. Relieved of limiting frictions, mainstream economists and politicians equate *sustainable development* with sustained economic growth abetted by technological progress.” (Rees WE, 2019)

There are other factors like **corruption** (by money and power) that foster and profit from socio-ecological illiteracy. Because vested business interests perceive environmental sensitivities and

regulations as nasty obstacles to easy profits, they tend to subsidize public ignorance about environmental issues including climate change, by every means possible.

Economist Neva Goodwin: “Dominant economic system has permitted and sometimes encouraged economic actors (especially powerful corporations and governments) to ignore the harms they impose on people and other parts of nature having little political/economic power. These harms are not trivial; they have included the murder of indigenous people for the value of their lands or of the minerals under their lands; toxic wastes dumped in oceans and in the neighbourhoods of poorer people; schemes to cover-up the harms of profitable products like tobacco and fossil fuels; and, over many decades, **effective prevention of public education** about the dangers of climate change, and of ways to avert it –until it is too late to prevent a future of ever more catastrophe.” (Goodwin N, 2019, → [Addressing meta-externalities](#))

Corruption always comes with secrecy: Big donations to organizations that deny global warming are usually funnelled through third-party pass-through organizations that conceal the original funder (→ ["Dark Money" Funds Climate Change Denial Effort](#))

Books like *Merchants of Doubt* (N. Oreskes & E. Conway) and *Whitewash* (C. Gillam) explain in detail how certain scientists were somehow convinced or bribed into producing and publishing “favourable” research reports for pressing issues like fossil fuels, climate change, pesticides and GM seeds (→ [video: Merchants of Doubt](#)).

Scientist and social critic J. D. Bernal claims (in his book titled *Science in History*), **all social sciences** (including economics) suffer from the corrupting influence of the established order of power (Foster JB, Clark B, York R, 2010, *The Ecological Rift*, page 21).

Bernal explains this kind of corruption as follows: In normal times, mainstream social science has been more about maintaining and managing the given social order rather than encouraging revolutionary changes, despite all important discoveries in natural sciences including ecology. Social science can even invent imagined realities based on seductive ideologies if necessary (though in most cases not deliberately), to protect and strengthen the present order, unless serious crises require radical changes.

The corruption mentioned here is not necessarily about petty academic crimes like falsification of data, plagiarism or bribery; it is primarily about “capitulation to the status quo, and evasion of all alternative perspectives”, even at the cost of abandoning objective, honest and rational analysis.

A social order of **adverse selection and self-censorship** reinforces the cognitive inertia of the established mainstream assumptions and theories:

“Getting ahead in the academy (as well as in the media, the government, and other places in which social scientists are to be found) all too often involves self-censorship, a narrow focus on the relatively inconsequential, and leaving the big stuff (in terms of social change) off the table. Hence, social science becomes an accumulation of harmless platitudes with disconnected [and harmless] empirical additions.” (Foster JB, Clark B, York R, 2010)

Thus, Bernal claims, many problems of economics that we can observe today like serving to the interests of power, inventing imagined realities (i.e. rigid ideologies), adverse selection and self-censorship are quite common to all social sciences.

### B.15. Typical conflicts between mainstream economics and modern science

1. Natural sciences like evolutionary biology and ecology say “nature is the **primary reproducer** (i.e. primary producer and recycler). Mainstream (neoclassical or neoliberal) economics handles nature as if nature were a passive, lifeless raw material resource and dumping ground for waste.
2. Natural sciences say “**climate** should be our first priority; there is no economy without a life, there can be no human health without a healthy planet.” Mainstream economics says, “let’s not make crisis mongering; economic growth cannot be sacrificed for a few degrees of temperature difference. Technological progress and economic growth solve all social and ecological problems.”
3. Natural sciences say “production, consumption and economic growth cannot increase without limits; our planet has physical and ecological **limits**”. Mainstream economics says “we do not accept any limits; technological progress can demolish all kinds of limits (e.g. Green Growth fallacy).”
4. Human sciences say, “humans are not **rational consumers** (Homo economicus) whose happiness increases continuously as they buy more and more goods from the market. There is a nonmonetary production of nature and society, and there is a nonmonetary sustenance economy. Furthermore, humans have some social and ecological needs that cannot be purchased with money.” Mainstream economics prefers to ignore these claims, and continues to measure almost everything with money.
5. Natural sciences and mathematics (chaos theory) say “nature is a **complex and** nonlinear living system that can behave in unpredictable ways when pushed to its limits.” Mainstream economics and its noncritical branch environmental economics continue to represent nature with mechanistic and reductionist models.
6. Human sciences say “according to some happiness researches, the **quality of life** in many European countries including England started to diminish after the 1970s even though GDP continued to rise.” Mainstream economics insists on using GDP (Gross Domestic Product) as a proxy for wellbeing, and as the ultimate goal of economy.
7. Human sciences like anthropology and archaeology say “human history is not a continuous and linear history of **progress** in terms of social wellbeing. For example, many hunter-gatherer societies were more advanced in terms of health and equity than many agricultural or industrial societies.” Especially after 1990s, mainstream economics began to expunge qualitative courses like “history of civilisations” from the curricula to make place for other analytical courses like econometry, statistics and software development.
8. Nature and human sciences say “we can’t solve every problem of humanity with mechanistic human **technology**. Most social and ecological problems of our time like climate crisis and unsustainable industrial agriculture need social (i.e. political) and ecological solutions.” Mainstream economics says “technological progress alone can solve every kind of problem; we don’t need radical changes in our lifestyle.”

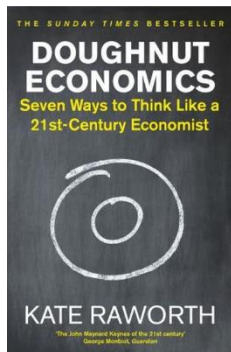
### B.16. The Growth Delusion: Ignoring non-monetary wealth and production (of nature and society); ignoring social and ecological destruction for the sake of monetary profits

“Growth for the sake of growth is the ideology of the **cancer** cell.” Edward Abbey (1927-1989)

“Unless we take steps to rid human societies of this economic pathology, malignant economic growth, like **cancer**, will destroy itself and its host as it exhausts the remaining supplies of accessible petroleum, the consequences of global warming become more severe and disruptive, and our own struggles for survival become more desperate and destructive.” David C. Korten in the foreword of *The Growth Illusion* by Richard Douthwaite (1999).

So many books and academic papers are written about the misleading fallacies of GDP (Gross Domestic Product) and GDP growth (economic growth) since 1970. Some examples to these books are:

- Small is Beautiful, E. F. Schumacher
- The End of Growth: Adapting to Our New Economic Reality, Richard Heinberg
- The Growth Illusion, Richard Douthwaite
- The Limits to Growth, Donella H. Meadows et al.
- The World After GDP: Politics, Business and Society in the Post Growth Era, Lorenzo Fioramonti
- The Growth Delusion: Wealth, Poverty, and the Well-Being of Nations, David Pilling

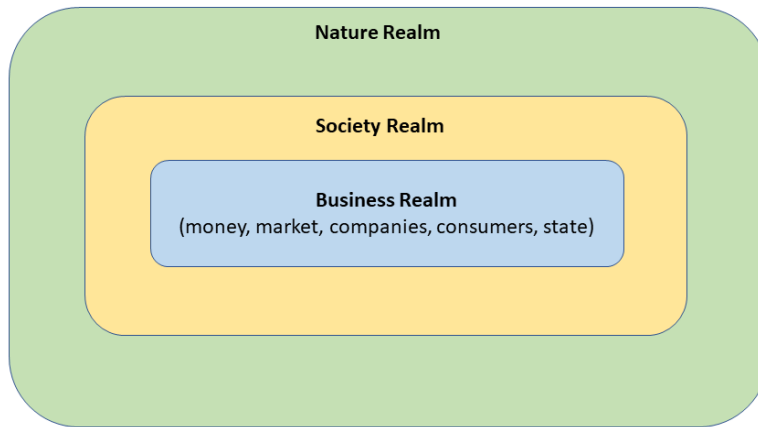


Doughnut Economics by Kate Raworth is another book which criticise the concepts of GDP and GDP growth. In this book, Raworth explains the mechanistic and reductionist foundations of the concept of GDP.

In one of her speeches (→ [Why it's time for Doughnut Economics | Kate Raworth | TEDxAthens](#)) K. Raworth explains, why the **flow diagram** of macroeconomics (circular flow of money and goods/services) is so influential, and at the same time, why it is fundamentally flawed: (1) Human economy is not a self-reliant, independent, closed system; it is deeply embedded in the environment (solar energy, biochemical cycles of nature, pollution, raw materials, biodiversity etc.). It doesn't work without the primary producer which is nature. (2) unpaid work (unpaid work at home, raising children, unpaid work in sustenance economies etc.), (3) social cooperation and solidarity (f.e. wikipedia as free encyclopaedia, free education, free recreation and entertainment, collaborative commons), (4) power relationships and unequal distribution of wealth (a single GDP number obscures the extremely unequal distribution of wealth, and thus, increasing poverty despite growing GDP numbers)

Raworth also explains, how a mainstream economist would react to those critiques: For environment you can study externalities in major classes if you like. For unpaid work... well, that sounds too feminist, doesn't it? For power relationships you should rather study politics (i.e. shifting important questions to other disciplines). These critiques are all sound and interesting, but you are distracting us from our real scope that is primarily about mathematical models (utility, supply/demand, equilibrium, price etc.) which makes our field scientific and objective.

That mainstream economics ignores or downplays the importance of social cooperation is probably related with the ideology of **individualism** built in the theory of neoclassical or neoliberal economics. This ideology of individualism (against all kinds of state regulations) is even stronger in neoliberal economics compared to its earlier twin soul neoclassical economics.



In my opinion, all these fallacies and deficiencies are natural consequences of the mindset that (1) reduces the whole economy to the **business realm** by simply ignoring the social and ecological realities of life, and (2) that tries to obtain scientific respectability and justification through misuse of mathematics (Newton envy, or “premature mathematization”

as E.F. Schumacher wrote in *Small is Beautiful*). Veblen said, political economy had started as a decent branch of political philosophy with classical economic thinkers like Smith, Ricardo, Mill and Marx, but unfortunately it degenerated then into a crude business ideology.

The side-effect of premature mathematization is narrow focus on only easily measurable things like money, price and quantity, with the consequence that, nonmonetary or qualitative issues that are so important for wellbeing of the society are conveniently ignored for the sake of sanitized analytical modelling.

In his paper titled “What's wrong with GDP and growth?” (Gadrey J, 2004, → [google reader](#)) economist Jean Gadrey summarizes the **flaws of the concept of GDP** growth as follows:

1. Everything that has monetary value, and can be sold will bump up GDP and growth, whether it adds to the individual or collective wellbeing, or not.
2. Many activities and resources that add to wellbeing are not counted (in GDP) simply because they are not market activities or resources, or because they don't have a direct production cost expressed in money terms.
3. GDP is obsessed with (monetary) outputs, but it takes no account of (nonmonetary and qualitative) outcomes (of economic policies) that are very important for wellbeing. Nor does it take account of issues like the distribution of wealth, inequalities, poverty, economic security etc. even though all these issues are unanimously regarded as aspects of a society's wellbeing.

And yet, Gadrey claims, many (mainstream) economists and politicians continue to use the concept of economic growth as a proxy for wellbeing and progress. Some economists and politicians began to talk about *sustainable growth* which is for economists like J. Bellamy Foster just another upgraded fallacy based on business myths like **Green Capitalism**; i.e. green technologies will save the world; no need to change our established (mainstream) economic paradigms and wasteful lifestyle that are based on growth, profits and consumerism (Foster JB, Clark B, York R, 2010).

Olivier Vaury explains the fundamental flaw of GDP as follows: “GDP includes many goods and services that do not increase a country's economic wealth, and, furthermore, excludes many goods and services that do. Hence, the use of GDP as an indicator of economic progress is flawed, and results in biases in international comparisons.” (Vaury O, 2003, → [Is GDP a good measure of economic progress?](#))

In his book named *The Illusion of Growth* (how economic growth has enriched the few, impoverished many and endangered the planet), R. Douthwaite writes (Douthwaite R, 1999):

- a) GNP (or GDP) ignores non-monetary production of nature
- b) GNP (or GDP) ignores non-monetary production of society



Douthwaite writes: “Growth only measures changes in gross national product (GNP) — the total sale value of all the traded goods and services produced in a country during a year — and this is a very odd animal indeed. For example, since GNP only includes the value of things that are bought and sold, the vast array of activities outside the monetarized part of the economy is ignored entirely.” (Douthwaite R, 1999)

**Figure-6:** Factors of quality of life. Source: The Illusion of Growth, R. Douthwaite

Definition of the quality of life	per cent	A life-quality (wellbeing) research in UK during the period 1970-1975 showed that 71% of the factors that people perceived as important for their life-quality were about things like family and home life, social life and health that have little or nothing to do with cash. Consumption was only one of the many factors in the resultant list. (Douthwaite R, 1999)
Family and home life	23	With his remark “economic growth has enriched the few, impoverished many” Douthwaite emphasizes the imperialistic, exploitative and extractive nature of economic growth. In other words, Douthwaite says that the enrichment (i.e. economic growth) of the privileged minority comes at the high cost of others’ impoverishment, as explained in detail in books like <i>Auf Kosten Anderer</i> (in English: at the cost of others, → <a href="http://www.AufKostenAnderer.org">www.AufKostenAnderer.org</a> ).
General contentment	19	
Money and prices	18	
Living standards, consumption	17	
Social values	16	
Personal beliefs, religion	11	With his remark “economic growth has enriched the few, impoverished many” Douthwaite emphasizes the imperialistic, exploitative and extractive nature of economic growth. In other words, Douthwaite says that the enrichment (i.e. economic growth) of the privileged minority comes at the high cost of others’ impoverishment, as explained in detail in books like <i>Auf Kosten Anderer</i> (in English: at the cost of others, → <a href="http://www.AufKostenAnderer.org">www.AufKostenAnderer.org</a> ).
Social relationships	10	
Housing	10	
Health	10	
Work	9	
Freedom of all kinds	7	
Leisure, holidays, travel	6	
Natural environment	4	
Education and culture	4	

Source: *The Illusion of Growth*, R. Douthwaite

the cost of others, → [www.AufKostenAnderer.org](http://www.AufKostenAnderer.org)).

Apropos economic imperialism, V. Shiva wrote: “The insatiable appetite of growth, and the ideology of development based on it, are the prime factors underlying the ecological crises and the destruction of natural resources.” (Shiva V, 2005, page 47)

In one her speeches, V. Shiva explains eloquently, why economic growth means poverty for the majority, not only in India but all over the world (→ [video: Festival of Dangerous Ideas 2013: Growth = Poverty](#)). In another speech, she talks about the [lunacy of economic growth](#) (YouTube video).

Shiva says “growth today is mining our future”, that is, making the powerful minority (global investors and corporations) even richer and more powerful at the cost of future generations. Shiva claims that the conception of economic growth reflects the mechanistic and reductionist worldview of corporate interests, which separates ecology from the conception of economic wellbeing (**ecological apartheid**).

As I had mentioned in my previous progress report, economic (and military) **imperialism**, a dismal reality of life, is generally ignored in most standard textbooks for undergraduate students of economics. For example, words like “imperialism, exploitation, (Immanuel) Walerstein, extractivism, (John A.) Hobson” don’t exist at all in Mankiw’s *Principles of Economics* (7<sup>th</sup> edition), one of the most popular textbooks for teaching economics.

As many economists and politicians continue to use the rhetoric of economic growth as if it were the ultimate purpose of all economic policies, younger generations began to realize the deep conflicts between economic growth (i.e. business as usual) and survival of humanity:

**Greta Thunberg:** “People are suffering. People are dying. Entire ecosystems are collapsing. We are in the beginning of a mass extinction. And all you can talk about is money and *fairy tales of eternal economic growth*. How dare you!” (→ [her related tweet](#))

Peter Söderbaum (ecological economist): “Adhering to neoclassical theory with its focus on economic growth in GDP-terms is perceived by an increasing number of people as unsustainable.” (Söderbaum P, 2002)

Another factor that probably played an important role in the misconception of GDP as a measure of wealth or wellbeing is the empty world (**limitless world**) paradigm, as often mentioned by authors like Naomi Klein and Vandana Shiva. How did the earlier classical economic thinkers come to believe in a limitless world?

First of all, classical economists can be (at least partially) excused for not being aware of the physical and biological planetary constraints, because the world was relatively pristine and empty at that time, with a very low level of consumption compared to today’s level. For example, the estimated world population was about 1 billion in 1804, whereas it is almost 8 billion as of today (7.7 billion in February 2020). People began to talk about global-scale environmental problems only later, in the 20<sup>th</sup> century; especially after 1960, due to the influence of intellectual pioneers like Rachel Carson who wrote *Silent Spring*.

But still, already in the 18<sup>th</sup> century, there were over-polluted cities in the world like London. It should not be too hard to imagine that this pollution and destruction could easily become a global phenomenon with the expansion of destructive and polluting industry.

In his article named [Origins and Delusions of Green Growth](#) (published in ISR: International Socialist Review) Gareth Dale investigates the origins of the belief in a limitless world:

“... Ricardian notion was that the logic of diminishing returns, which had cast a cloud over the growth predictions of the classical economists, could be postponed to the *almost indefinite future* by technical progress and spatial fixes such as foreign trade and the exploitation of the almost limitless resources of the extra-European world. The same century witnessed that limitless world become integrated into the Western world-system, and with this a new geography (i.e. America) of power came into being, a relational geography in which the power and status of the advanced powers depended decreasingly upon territorial sway and increasingly upon economic success—soon to be conceived of as growth.”

In her latest book “On Fire” Naomi Klein questions the **central fiction** of the mainstream economic model, that caused ecological crises like climate change: “... that nature is limitless, that we will always be able to find more of what we need, and that if something runs out, it can be seamlessly replaced by another recourse that we can endlessly extract. And it is not just the atmosphere that we have exploited beyond its capacity to recover [i.e. ecological carrying capacity]; we are doing the same to the oceans, to freshwater, to topsoil and to biodiversity. The expansionist, extractive mindset that has so long governed our relationship to nature is what the climate crisis calls into question so fundamentally.” (Klein N, 2019)

Apparently, factors like empty world paradigm, closed-system illusion of economic flow diagrams, blind belief in endless progress, limiting economy to the business realm, technological fundamentalism, confusing geographical expansion and exploitation with economic growth and ecological ignorance; all conspired together to establish a rigid belief in limitless economic growth.

V. Shiva defines **technological fundamentalism** as follows: “The unshakeable belief in the idea that there is a technological fix for every social and environmental problem.” (→ [Earth Democracy and the Rights of Mother Earth](#))

In his article titled “Growthism: its ecological, economic and ethical limits” (→ [Economics and the Ecosystem](#)) Herman Daly explains, how economic growth becomes **uneconomic growth** (i.e. damages society more than its benefits) after certain social and economic limits are reached:

“What we conventionally call economic growth in the sense of the growth of the economy has ironically become uneconomic growth in the literal sense of growth that it increases costs more than it increases benefits. ... Well before becoming physically impossible, the growth of the economic subsystem (i.e. business realm) becomes uneconomic in the sense that it costs more in terms of sacrificed ecosystem services than it is worth in terms of extra production. ... The public is bamboozled by technical obfuscation, and by the false promise of growthism that one day we will all be rich.” (Daly H, 2019)

Why do economic elites (i.e. the rich rentier class) like the idea of economic growth so much? Naomi Klein explains it as follows: “... one of the major benefits of a growth-based economy for elites is that it allows them to constantly defer demands for economic justice, claiming that if we keep growing the pie [a popular metaphor like the trickle down theory], eventually there will be enough for everyone. This was always a lie, as the current inequality crisis reveals, but in a world hitting multiple ecological limits, it is a nonstarter.” (Klein N, 2019, page 88)

Another misleading fallacy that is built in the concept of GDP is **defensive expenditures** (Gadrey J, 2004, page 265) which is also called repair expenditures (→ patching in [ecosystem mutilation and patching business](#)). In most cases, additional repair costs to the society due to social and ecological destruction (negative externalities) that certainly reduce sustainable wellbeing, are added to GDP as positive growth items.

Jean Gadrey writes: “Expenditure (and the corresponding output) incurred in repairing the damage caused by human actions should not be counted as a positive contribution to real wealth. If such damage (pollution, crime, road accidents, etc.) reduced wellbeing and makes it necessary to produce goods and services (whose value is X) in order to repair or defend, there can be no question of X being counted as a positive item in any measurement of real wealth.” (Peil J, Staveren I, 2011, page 128).

Closely related with the phenomenon of defensive expenditures is the **Lauderdale Paradox**, that claims that the increase (i.e. growth) in private wealth of the powerful minority (i.e. economic elites) is obtained at the expense of the decrease in public wealth:

“A long view of the history of capitalism reveals that growth has always depended on enclosure. This is done not order to acquire free value from the commons but also, I argue, in order to create an *artificial scarcity* that generates pressures for competitive productivity.”

A typical example for creating profitable scarcities through destruction (i.e. meta-externalities) is ecological destruction or pollution of local water sources, privatization of remaining water sources and selling drinking or irrigation water by giant multinational water monopolies (→ [ecosystem mutilation and patching business](#)).

That’s why economics is not only about the production and distribution of scarce goods and services because abundant resources like clean food, water or air may become scarce within time due to exploitative business activities.

“Today Lauderdale Paradox is even more significant than it was when originally formulated in the early nineteenth century. Water scarcities, air pollution, world hunger, growing fuel shortages, and the warming of earth are now dominant global realities. Moreover, attempts within the system to expand private riches by exploiting these scarcities, such as the worldwide drive to privatize water, are ever-present.” (Foster JB, Clark B, York R, 2010, page 67)

Creating **artificial scarcities** (for example, increasing need and demand for chemical fertilizers and pesticides) in agriculture by pushing many countries to the direction of industrial agriculture (based on socially, economically and ecologically unsustainable monocultures of cash crops) is another example of the Lauderdale Paradox in practice (V. Shiva, M. Pollan). Industrial agriculture was often promoted as *Green Revolution*, economic growth, technological progress and modernization by vested business interests.

After analysing all the fallacies and weaknesses of GDP, let's see how the issues of GDP and economic growth are handled in a typical economics textbook for undergraduate students.

In **Principles of Economics by Gregory Mankiw** (7<sup>th</sup> Edition), on page 485:

“This chapter considers gross domestic product, which measures the total income of a nation. GDP is the most closely watched economic statistic because it is thought to be the best single measure of a society's economic well-being.”

Notice the dogmatic and single-truth teaching style: “... because it is thought to be the best single measure of a society's economic well-being.”

This is how G. Mankiw defines GDP: “Gross Domestic Product (GDP) is the market value of all final goods and services produced within a country in a given period of time. GDP measures two things at once: the total income of everyone in the economy and the total expenditure on the economy's output of goods and services. GDP can perform the trick of measuring both total income and total expenditure because these two things are really the same. For an *economy as a whole*, income must equal expenditure.”

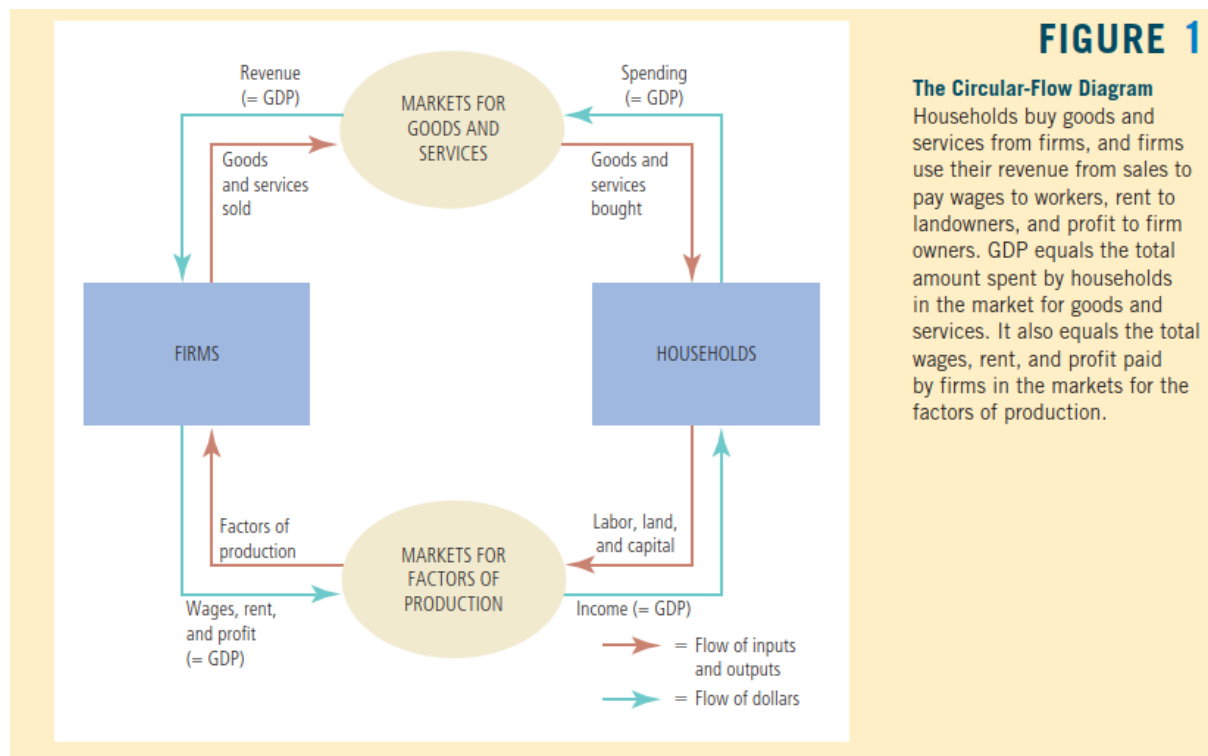
So, here we learn that the economy as a whole is only about money (income and expenditures); there is no nonmonetary production of nature or society.

And let's see, what Mankiw thinks about wellbeing and quality of life:

“If you were to judge how a person is doing economically, you might first look at her income. A person with a high income can more easily afford life's necessities and luxuries. It is no surprise that people with higher incomes enjoy higher standards of living—better housing, better healthcare, fancier cars, more opulent vacations, and so on. The same logic applies to a nation's overall economy. When judging whether the economy is doing well or poorly, it is natural to look at the total income that everyone in the economy is earning. That is the task of GDP.”

Here, we learn that the quality of life is only about things that we can buy with money; housing, healthcare, cars... Nonmonetary issues like the qualitative social and environmental factors play no significant role at all (i.e. not worth to mention in a serious scientific university textbook). Or maybe, all these nonmonetary and qualitative factors of wellbeing can be considered as unchanging background factors, or in any case, totally independent of (i.e. not influenced by) monetary market or business activities.

This is the famous **circular flow diagram** on page 485 (→ Principle of Economics 7<sup>th</sup> Ed., G. Mankiw):

**Figure-7:** GDP flow diagram. Source: Principle of Economics 7th ed., G. Mankiw

Here, we learn that economy is all about firms, households, markets, goods and services (sold on the market) and money. Note that this is the **pure business realm** that exclude the complexities of society and nature. That is, we don't need to consider the complex social and ecological aspects of life which makes everything so much easier.

That circular nature of the flows of goods and services has a certain soothing effect that gives confidence; one gets the feeling that such an economic system has no sinks, no over-accumulation, no deficiencies, no pollution, hence no sustainability problems; it can work for ever. Thus, limitless growth and progress thanks to the again limitless advances in technology...

Let's check if Mankiw warns students about the weaknesses GDP in the following pages of the chapter named "Measuring a Nation's Income". Maybe he has also some warnings for the limited and idealized business realm reflected in the circular flow diagram.

Yes, luckily, he has some warnings:

GDP accounting uses market values; in that way it can add oranges to apples.

"GDP tries to be comprehensive. It includes all items produced in the economy and sold legally in markets. ... GDP excludes most items produced and sold illicitly, such as illegal drugs."

Here, we learn that **illegal items** like harmful drugs are conscientiously excluded from GDP accounts. The student should ask "what about the legalized unethical and parasitic earnings like profiting from social and ecological destructions (i.e. repair expenditures)?" Is black money (or dark money) only about illegal earnings?

"It also excludes most items that are produced and consumed at home and, therefore, never enter the marketplace. Vegetables you buy at the grocery store are part of GDP; vegetables you grow in your garden are not."



This is actually an important warning because here, Mankiw implies **nonmonetary production** of nature and society, which was conveniently excluded from the mechanistic flow diagram. However, he chooses here not to elaborate or generalise the issue with terms like “nonmonetary production”. Literally and practically, the scope of the example remains limited to garden vegetables. A conceptual expansion of the inquiry into new fields like nature and society, that is, a broadband and interdisciplinary analysis, is totally missing. I wonder, what proportion of the students will be perceptive and imaginative enough to think deeper and broader about this particular example.

Having established the foundations of GDP, Mankiw goes on with mathematization as required by a real, respectable hard science like physics: Components of GDP ( $Y = C + I + G + NX$ )

After some mathematical elaboration (GDP deflator etc.) we come to the last part of the chapter: “Is GDP a Good Measure of economic Well-Being?”

Now this is important, I think, we can find some real warnings here. He mentions the critique of R. Kennedy in 1968, and writes:

“Much of what Robert Kennedy said is correct. Why, then, do we care about GDP? The answer is that a large GDP does in fact help us to lead good lives. GDP does not measure the health of our children, but nations with larger GDP can afford better healthcare for their children. GDP does not measure the quality of their education, but nations with larger GDP can afford better educational systems. GDP does not measure the beauty of our poetry, but nations with larger GDP can afford to teach more of their citizens to read and enjoy poetry.”

Here, we learn that one can buy health with money. This means, with sufficient money, we can repair all the social and environmental destruction, including the pollution of soils and water resources and the loss of biodiversity.

“Because GDP uses market prices to value goods and services, it excludes the value of almost all activity that takes place outside markets. In particular, GDP omits the value of goods and services produced at home. When a chef prepares a delicious meal and sells it at her restaurant, the value of that meal is part of GDP. But if the chef prepares the same meal for her family, the value she has added to the raw ingredients is left out of GDP. Similarly, child care provided in day-care centres is part of GDP, whereas child care by parents at home is not. Volunteer work also contributes to the well-being of those in society, but GDP does not reflect these contributions.”

Because he is not explicit about the “world outside markets” (nature, society, complex social and ecological relationships that are essential for wellbeing) one gets the feeling, GDP covers almost everything excluding some minor details like cooking, child care and voluntary work that are mentioned here generously for the sake of scientific completeness.

Mankiw closes the chapter with a last remark in a most decent and scientific manner: “In the end, we can conclude that GDP is a good measure of economic wellbeing for most—but not all—purposes. It is important to keep in mind what GDP includes and what it leaves out.”

Let's see which points are left out by Mankiw in the context of GDP and economic growth:

1. The problem of political and economic inequality (incl. power relationships); unequal income distribution, and the effect of this inequality on general wellbeing
2. Defensive (or repair) expenditures and Lauderdale Paradox; repair/defensive expenditures due to social and ecological destruction are generally added to GDP accounts
3. Nonmonetary capital and production of society and nature; nature as the primary producer
4. There are many qualitative factors of wellbeing that one cannot buy (or replace) with money. Many of these qualitative factors of wellbeing can but be destroyed in the endeavour of earning money (unpaid or unpunished externalities, parasitic earnings)

5. There are lots of academic books and papers written since 1970, that criticise growth and growthism. These resources are not mentioned, or referenced.
6. Other measures of wellbeing, for example comprehensive happiness indices

I think, the circular flow diagram of GDP is, pedagogically and epistemologically, one of the most refined and influential tools to **limit the mental scope** of an average student of economics to the business realm, ignoring almost all social and ecological realities of life, allowing only for some minor and insignificant details like garden vegetables, cooking, child care and voluntary work. This is a kind of *epistemicide* in the words of Prof. Graupe (Graupe S, 2019).

Ecological economist Herman Daly explains, what kind of impression is imprinted on the minds of young economics students with the circular flow diagram:

“The economy is represented as an isolated system; nothing enters from the outside, nothing exits to the outside. There are no natural resources entering from the ecosphere, no wastes exiting back to the ecosphere. Indeed, there is no ecosphere, no containing and constraining environment of any kind.” (Daly, 2019, → [Growthism: its ecological, economic and ethical limits](#))

### **B.17. Most Popular Myths of Mainstream Economics**

These are in my opinion the most popular myths of mainstream (neoclassical, neoliberal) economics.

Note that most of these myths are also myths of modern Western industrial education that generally fosters sufficient level of ignorance in disciplines like philosophy, ecology, anthropology, history, music and other fine arts. In most cases, these broad-view disciplines help us see the complete picture related with big economic questions.

*1) If a company is earning money in legal ways, it must be producing something useful for the society, and creating new jobs.*

Ignores many legal ways of earning money with huge hidden (social and ecological) costs to the society, like dirty mining/industry/energy projects, or industrial agriculture based on mechanistic monocultures.

A myth, much inspired by the “invisible hand” argument of Adam Smith, ignores invisible costs (negative externalities) to today’s societies and future generations.

This is probably the most central, most popular, and for the exploitative multinational investors and corporations most useful myth, which boils down to: “Every medium is right for earning money and power, provided that it has a legal and ideological cloak.”

Because politicians and governments can be manipulated with money in our modern times (a global tendency since 1990s) along with mass media and mainstream (industrial) education, this in turn boils down to: “Money justifies everything!”

Big investors like Gates and their wealth managers (e.g. BlackRock and Vanguard), who are shareholders of many multinational corporations, have today sufficient power to dictate what should be legal or illegal in a country. For example, criminalizing organic seeds to open up the market for GM seeds of agrochemical companies (Shiva, 2016; → “Who Really Feeds the World”).

*2) Every country in the world can become «developed» to reach better “living standards” by following the same historical path of a “developed” country like Germany (education, industrialization, organization, technology, urbanization, modern institutions...)*

Ignores military and industrial imperialism, global oligarchies and monopolies, physical and ecological limits of the world.

It erroneously assumes, there is, or there must be, a single direction of development and progress for every society in the world (Western ideology of progress).

“Living standards” is also a very much disputed term. Societies cannot be compared or measured by living standards because there are different cultures and with different needs and lifestyles. How can you compare the living standards of a lion and a leopard? For example, the concept of education (i.e. what is a good education?) can be different for every society and lifestyle.

Believing in this myth is like believing, everyone in a society can become rich by simply stealing from others. The money mogul of the village didn't become rich because he worked more, smarter or more efficiently than the others, but because he controlled and monopolized strategic resources much earlier than the others.

*3) Let's make the cake bigger (GDP growth) so that everyone can get a larger slice (popular growing cake analogy for economic growth).*

By ignoring the non-monetary production of nature and society (through narrow focus on money and market only) erroneously assumes that GDP (Gross Domestic Product) is a good measure of economic production and welfare (mechanistic and monetary reductionism).

Also ignores hidden costs (externalities) to society and nature due to destructive and exploitative business practices that earn millions of dollars for their investors and other stakeholders.

Considering the complete picture, including non-monetary production of society and nature, many economies are not growing at all as the deceptive GDP numbers imply. In fact, «ecological carrying capacity of the world», which is a much more complete and important measure than the narrow-sighted GDP, is rapidly decreasing.

*4) Let's develop our economy first; we can think about the environment later.*

Erroneously assumes, there can be an economy without the primary reproduction of nature (air, water, soil, stable climate, forest and marine products...) and soil (healthy agriculture and food).

Also erroneously assumes, environmental health is a luxury (optional, secondary) good, because it fails to recognize the ecological connection of environmental health with human health (i.e. atomism and separationism of *mechanistic worldview* as an antithesis of *organic worldview* that says everything is connected).

In fact, there cannot be healthy food if the soil is not healthy, and human health requires first of all healthy food, and healthy environment.

Besides, health of economy (?) cannot be more important than the health of society.

*(5) As you know, factors of production are land, labour and capital.*

Ignores the primary reproduction of nature (living ecosystems like forests, rivers, oceans etc.). For neoclassical economics, land is a non-living, non-destructible, mechanistic entity.

For neoclassical economics, there is only one producer: Human. Nature is not an active producer; it is only a passive raw material resource, and a passive dumping ground for waste. Nature doesn't produce things like food, air, water, soil, fire wood, medical plants, stable climate...

*(6) Especially for developing(!) countries, foreign investment is the key for economic growth and development.*

Ignores the fact that (if not assessed and regulated properly) most of these investments are channelled to (for the investors) very profitable, but socially exploitative and destructive projects, like dirty mining/industry/energy and industrial agriculture (i.e. ecosystem mutilation and patching business).

*(7) Humanity has progressed continuously with industrialization, urbanization and technological progress.*

Ignores the real history of civilizations, and the discoveries of modern anthropology and archaeology (Western cultural racism and its ideology of progress).

Technological fundamentalism or over-optimism: Blind faith in technology, generally fostered by ecological and historical ignorance, which erroneously assumes that technological progress (human-made tools & devices) can solve every kind of social and ecological problem.

Erroneously assumes, human condition (living standards etc. as if there were universal standards for living) improved continuously all over the world (wherever there is economic development & growth in the neoclassical sense) within the last centuries.

*(8) Industrialization and urbanization are primary keys for economic development and progress.*

Progress in what? Progress in general well-being of the society, including future generations? No, progress in the monetary wealth of the privileged minority (i.e. investors & other stakeholders of corporations).

Prof. Lorenzo Fioramonti (economist), author of "Wellbeing Economy", explains how exploitative industries transfer wealth from the society (including next generations) to the privileged minority:

Fioramonti: "According to a joint research by United Nations & World Bank, 20 largest industry sectors of the world including energy, mining, transport and food production (industrial agriculture) cause much more damage than their total profits." (Fioramonti, 2017; → [Video: The Wrong Economic Trajectory](#))

Urbanization makes people much less self-reliant in almost every aspect of life including food, shelter, clothing and entertainment. City people are much more dependent on the commodities and technologies of corporations.

In fact, destruction of self-reliant & sustainable local economies for the benefit of exploitative & industrial urban economies, often in the name of economic development, benefits the parasitic ecosystem mutilation and patching business.

## **C. REPORTS: PLACE OF ECOLOGY IN MODERN ECONOMICS EDUCATION**

### **C.1. The place of ecology in the undergraduate theory and education of economics; international, UK, Germany and Switzerland**

*Research methods:* My research methods for part (b) of my PhD include: Reading existing reports about economics education, content analysis of most popular economics textbooks (principles, micro & macro), content analysis of department web pages (mission statements, lecture plans, other department information), unstructured and semi-structured interviews with some academicians to obtain more information about a particular country or university.

I realized that mission statements of economics departments tell quite a lot about the dominant mindset and priorities of the department. So far, I analysed the mission statements of some Swiss universities. It is remarkable that most of these mission statements look very much like business propaganda.

I also tried to get more information about the economics curricula and textbooks of some Swiss universities, but the exercise has proved much more difficult than I had initially thought. So far, my impression is, economics departments are quite reluctant to give information because they seem to be inclined to keep the status quo (i.e. the dominance of neoclassical/neoliberal economic thought) as long as possible. As the 2019 WWF report underlines, Swiss universities have done virtually nothing for a more pluralist and broadband economics education, except for some superficial initiatives for the sake of appearance and formality. This attitude reminds me the trying to keep the profitable status quo related with dirty or dark money as long as possible, until the international protests become too powerful to endure (e.g. insistence on keeping bank secrets, shielding exploitative and destructive Swiss companies like Glencore and Syngenta from trial in Swiss courts despite referendum outcome in November 2020).

The response of an academic (an environmental economist!) from the University of Bern to my questions about pluralism can give you an idea about the dominant mindset: “The work of our department is based on quantitative methods both in education and research. I don’t think, anyone from this department can help you with your questions [about qualitative analysis and ecology in department].”

This is the information I received from RethinkEconomics.org (Ross Cathcart):

“Research has been done that covers the limitations of UK economics education although it tends to be framed and discussed in a more way about the limitations of a 'mainstream' education (as in the German example you linked above) rather than explicitly dealing with questions on sustainability specifically (as in the Swiss example above).”

With my research, I tried to find answers to following **questions**:

1. What are the global, national and university-specific institutions that shape (or constrain) the education of economics?



2. What is the dominant paradigm of teaching economics in a given country? How did this paradigm become dominant?
3. Are there universities and departments known for their own traditions and schools for the teaching of economics? How does the general landscape of economics education in a given country look like?
4. Which economy departments are perceived as the most prestigious ones? Why?
5. How does a typical lecture plan (undergraduate economics) look like? Are there significant deviations within the country?
6. Are there lectures and other activities in the lecture plans that foster ecological literacy, or at least holistic view and qualitative analysis in general?
7. What are the most popular economics textbooks? (micro and macro) What is the place of ecology in these textbooks?
8. With respect to ecological literacy, pluralism and qualitative analysis: How is the development of economics education compared to the education 10 or 20 years ago? What are the most recent developments (positive or negative)?
9. Which educational values and priorities are promoted in the brochures and web pages of economics departments?
10. Did the student and academic movements for “Rethinking Economics” since 2000 cause significant changes at some universities?

These are the most important **repositories of reports** about economics education (international, UK, Germany, France, Switzerland) I could find so far:

*International, including UK and Germany:*

[Econocracy: The perils of leaving economics to the experts \(2017\)](#)

A comprehensive critic of economics education in UK, with suggestions for improvements.

[Open Letter](#): International Student Initiative for Pluralism in Economics (2014-2016)

[OIKOS: Mapping Pluralist Research Reports \(2019\): An overview of research within the student movement for pluralism in economics](#)

An overview report of the current situation, with links to many research reports about economics education in Europe, including cases from UK, Germany and France

OIKOS report: Mapping Pluralist Research (pdf document)

<https://oikos-international.org/wp-content/uploads/2019/03/Mapping-Pluralist-Research-Final.pdf>

Academic paper: [Integrating sustainable development into economics curriculum, Peter Bradley](#)

*Germany:*

[Studie EconPLUS](#) (in German)

Summary Report in English: [Pluralism in the economics curriculum in Germany](#) (EconPLUS)

[Forschungsergebnisse des Themenbereichs Neues ökonomisches Denken](#)

*Switzerland:*

WWF reports in German: [Nachhaltige Hochschullandschaft Schweiz](#)

Summary Report in English: [Sustainable Development in Economic Sciences](#)

[WWF übt Kritik an Schweizer Hochschulen: Mangelhaftes Engagement für die Nachhaltige Entwicklung \(2019\)](#)

(In English: WWF criticizes Swiss universities: Inadequate commitment to sustainable development)

## C.2. Open Letter: International Student Initiative for Pluralism in Economics

([www.isipe.net](http://www.isipe.net))

Published by more than 65 student associations from 35+ countries, the criticism in Open Letter can be summarized as follows:

1. Economics should become reality based; i.e. not based on unrealistic abstract models and misuse of mathematics (Newton or physics envy) based on flawed assumptions
2. Economics should be problem led, not method led; i.e. not trying to fit the reality to models, not providing only a partial and fragmented view of the object of inquiry
3. Economics should (like physics) be **pluralistic**, not monistic; i.e. multiple schools of thoughts, multiple viewpoints for different aspects of life (social, ecological, political...)
4. Economics should be knowledge driven, not ideology driven

## C.3. Micro, Macro, Maths: Is that all? An International Study on Economics Bachelor Curricula by ISIPE (2017, international)

*From the “abstract” of this paper:*

“Program syllabi were reviewed for 13 countries worldwide including Argentina, Brazil, Chile, Denmark, France, Germany, Italy, Israel, Mexico City, Portugal, Spain, Turkey and Uruguay. ... The method follows the approach by PEPS (2014)”

“The international survey attests a dominance of the MMM core, i.e. the relative importance of the courses in microeconomics, macroeconomics and maths, as represented by calculus and statistical methods. According to the sample, the MMM core accounts for 40,4% of the study time on average. This characteristic is similar across different countries as represented by a low standard variance. On the other side, only a minimum amount of time is devoted to reflexive courses such as economic history or history of economic thought (4,2%).”

“The study thus confirms a high degree of similarity of the course structure of the economics bachelor degrees on a global scale and a lack of pluralism. Economics needs a more diversified body of knowledge if it is going to respond successfully to the multidimensional challenges of contemporary society.”

Interesting findings and statements from the report:

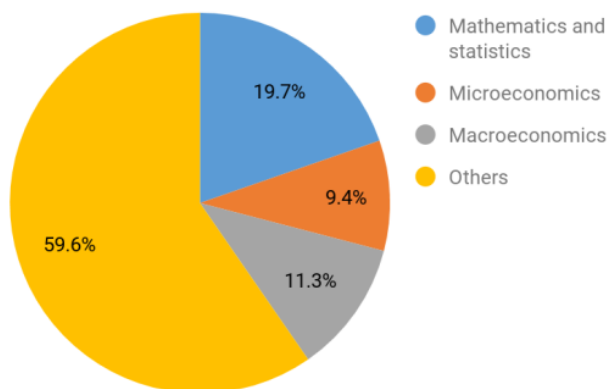
1. It is a common critique among many nations that economics curricula are dominated by neoclassical economics, few courses on history of economics thought and scarce references to other social sciences disciplines.
2. “Today [2017] the open letter is officially supported by almost 3000 individuals in 110 countries, confirming that ISIPE is indeed a global movement.”
3. “... all courses reviewed teach the neoclassical view, which they describe, following Colander (2000), as being characterized by the trinity of: individualism, optimization and equilibrium. Further, neoclassical economics is described as a ‘mechanical view of the world’ which is characterised by knowable, predictable forces.” (Earle et al. 2017, p. 39) Note: This mechanical world-view are in conflict with sciences like ecology and complexity (i.e. complex systems, chaos theory) that claim living ecosystems are complex, nonlinear and unpredictable systems.
4. **Standard textbook dominated teaching:** “The high concentration of the market for textbooks for the principles course as well as intermediate microeconomics and intermediate macroeconomics gives further substance to the the notion of a pretty unified body of course content. E.g. in Germany, 90% of economics bachelor (Volkswirtschaftslehre) students are told to read the highly formalized textbook by Varian in their first microeconomics course. Several studies confirm that the way, in particular microeconomics, is taught is very much the same. Core topics, that are covered in the standard textbooks include household/consumer theory, theory of the firm/producer

theory, which are combined almost everywhere in an equilibrium model. ... A look at most common textbooks demonstrates a high degree of formalization and a strong focus on neoclassical content. On the other hand, content that nurtures reflections and critical thinking is marginalized." Macroeconomics may be slightly less standardised compared to microeconomics.

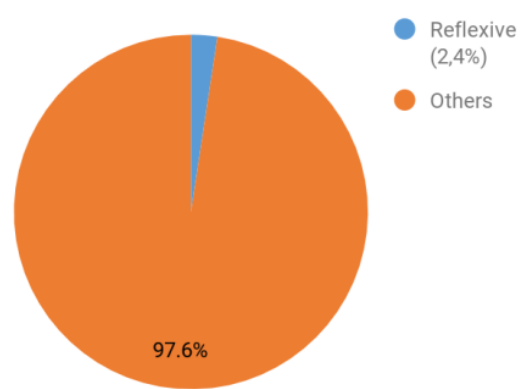
5. MMM core (micro, macro, math) dominates everywhere: "Little time is devoted to explicitly reflexive courses. This category includes courses on history of economic thought, epistemology, philosophy of science and economic theories. ... Quantitative methods make up a big piece of the study programs on average. The dominance of formal methods is robust over all countries with a high share everywhere. ... What is especially striking is the very low variance of the MMM core over different countries. Over all courses, the normalized standard deviation is lowest for the courses of the MMM core. Maths, micro and macro is central everywhere."

**Figure-8:** Interesting graphs from the paper "Micro, Macro, Maths", ISIPE

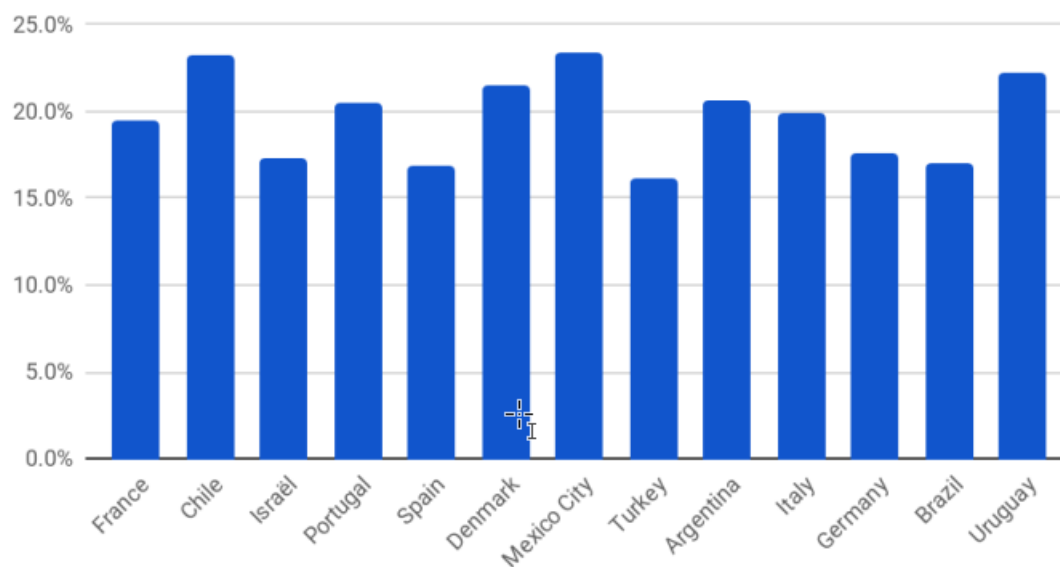
1: Importance of the MMM-Core



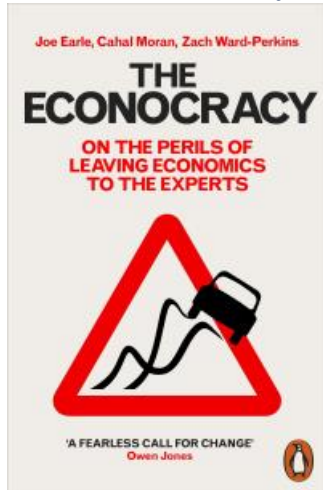
2: Importance of "Reflexive"



3: Mathematics and statistics : high everywhere



#### C.4. The Econocracy (UK)



“The Econocracy” (Earle, Moran, Ward-Perkins, 2017) is the most comprehensive report I have found so far about the situation of economics education in UK. Because the case in UK is very similar to the case in many other countries (see Open Letter at [isipe.net](http://isipe.net)), main ideas and findings of “The Econocracy” are very well worth to summarize to explain the general situation in the world.

See reviews for “The Econocracy”: [Manchester University Press – Guardian: How three students caused a global crisis in economics](#)

**Econocracy:** “A society in which political goals are defined in terms of their effect on the economy, which is believed to be a distinct system with its own logic that requires experts to manage it.” (page 7)

##### *The Econocracy: Important Main Ideas*

1) Economy is too important a subject to be left to the experts with an extremely narrow education (i.e. neoclassical economics). Economics must be a much broader and pluralist education, and the role of economists must be informing citizens so that they can take better democratic decisions; i.e. not taking decisions for the citizens.

The Econocracy: “Economics is for everyone precisely because it effects everyone. It is therefore too important to be left to the experts.” (page 4)

The Econocracy: “... the history of economics as a discipline, the political events of the 20<sup>th</sup> century and the reforms to higher education have combined to create a world where economic decision making is delegated to experts who are not fit for the purpose.” (page 4)

The Econocracy: “Within econocracy, economic discussion and decision taking has become a technocratic rather than a political or social process.” (page 8)

The Econocracy: “We argue that econocracy is incompatible with democracy in two ways: ...” (1) “... political decisions are redefined as technical questions to be answered by experts, and thus removed from the public arena.” (2) “... as increasing areas of political and social life are colonised by economic language and logic, the vast majority of citizens face the struggle of making informed democratic choices in a language they have never been taught. ... Yet, elites seem happy to conduct public decisions about economic decision making in a language that excludes the vast majority.” (page 19)

The Econocracy: “... many aspects of our lives are embedded in and dependent upon the wider economic system. The barrier that prevents us understanding the economy and participating in economic debate doesn’t shield us from its consequences.” (page 24)

The Econocracy: “Today’s economic experts, like yesterday’s socialist planners, govern a system that is unable to take into account the diverse preferences that make up society or incorporate relevant locally situated knowledge and expertise. As a result, the decisions are both undemocratic and, to use the neoclassical language, socially suboptimal.” (page 153)

The Econocracy: “A turn toward broad democracy is a turn away from the technocratic consensus that has dominated both the left and right of politics in the twentieth century” (page 153) Note: This statement is very similar to the arguments of historian Christopher Lasch in “The Revolt of the Elites” (1995).

“A society of **Citizen Economists** is one in which individuals have more understanding and thus control over their circumstances.” (page 154)

Four main features of the discipline (i.e. neoclassical economics) are fundamentally incompatible with developing a thriving society of Citizen Economists (page 158):

- a) Economic experts, who tend to inform citizens of their economic analysis and decisions rather than engage them as equals, have lost the trust of citizens. (see the results of YouGov survey on page 158)
- b) Unequal one-way intellectual relationship between economists and citizens; citizens are passive, they are just told what the economic experts know, which is presented as undisputable scientific truth.
- c) Economic experts don't sufficiently "challenge the illusion, which they often actively advance, that they are the only people qualified to have a legitimate [i.e. scientific, respectable] opinion on economic issues." (page 159)
- d) The academic discipline of economics fails to understand or represent the needs and desires of wider society.

The Econocracy: "Economic experts often present economic theory as [the only appropriate tool for] identifying scientific truths while failing to admit the values and assumptions that the theories rest upon, and this cements unequal power relations between experts and citizens." (page 161)

2) Economics education must be reformed radically along with the whole economic system.

The Econocracy: "To prevent these [social and ecological] catastrophes and build sustainable, stable and prosperous societies our generation must have the ability to reimagine the economy." (page 5)

All the authors of "The Econocracy" are active members of Rethinking Economics (→ [www.rethinkeconomics.org](http://www.rethinkeconomics.org)).

The Econocracy: "The question is then not whether we want experts but what kind of experts we want. ... The role of experts is to inform citizens of their choices rather than to make those choices for them." (page 26)

The Econocracy: "Pluralism in economics expands the scope of understanding, and it can also show that the current political dichotomies [e.g. free market vs state] grossly over-simplify complex political questions and undermine the possibility for thoughtful political debate. ... Pluralism is necessary to ensure that the next generation of economic experts are not indoctrinated into a single perspective." (page 84)

The Econocracy: "**Public Interest Economists** must not be technocrats operating behind closed doors but experts who help citizens understand the discipline and who facilitate public discussions. To achieve this, they could learn from the Science Communication movement and establish 'Economics Communication' as a new discipline." (page 163)

The Econocracy: "Ultimately we believe that economics must become a public dialogue and never again be left only to the experts." (page 170)

3) GDP growth obsession: "GDP is the central statistics by which the economy is judged." (page 8)

The Econocracy: "As a result, nations could start comparing GDP growth, unemployment and inflation, and these became the central indicators of development and progress." (i.e. economic growth as a misleading proxy for development and progress)

The Econocracy: "Instead [i.e. ignoring many public concerns] the goal is simply to increase a number [i.e. GDP] that may fail to capture much of social reality, and that many people don't truly understand." (page 23)



The Econocracy: “Our YouGov poll suggests that when pressed with alternative ways of measuring economic success, GDP, even with its almost complete dominance in politics and the media, is not considered the most desirable gauge by the general public.” (page 167)

4) A typical example of hiding political and ethical judgements under technical jargon and calculation: Cost Benefit Analysis (CBA). Other examples are economic growth (i.e. GDP growth), technological efficiency, Pareto optimality, social welfare functions etc.

The Econocracy: “However, methods for attaching money valuations to such a broad range of costs and benefits always involve choices, value judgements and assumptions that are inherently political in nature. ... Yet under CBA this part of the process is hidden in a black box, invisible to the Parliament and the public, and decided without wider input and accountability, by the expert.” (page 10)

The Econocracy: “The choice of what models focus on represents an implicit judgement [i.e. hidden values, hidden political or ethical decisions] about what is important which is ultimately political in nature.” (page 40)

5) Neoclassical paradigm dominates international institutions like International Monetary Fund (IMF), World Trade Organisation (WTO), World Bank (WB) and OECD.

The Econocracy: “The Rise of economics can also be seen in international institutions like IMF, WTO, WB and aforementioned OECD. All these institutions have an economic reason d’être, rely heavily on economic experts, and conduct their business in the language of economics. ... They all rest on the assumption that economy is a distinct sphere of life with its own logic.” (page 13)

6) Neoclassical paradigm reduced economy (oikonomia in Greek: household management) to business, finance and trade (i.e. reducing economy to business realm).

The Econocracy: “Econocracy was born when societies began to seek to improve the economy as an end in itself, detached from its relationship to other parts of life, based on assumption that improving the economy improves all our lives.” (page 14)

The Econocracy: “Neoclassical economics has historically failed to recognise this insight [i.e. important nonmonetary work was done at home largely by women], probably because in its models agents act through exchanging commodities in markets, which are absent from homes.” (page 65)

7) Economics education has become a neoclassical indoctrination that is often disconnected from the (social and ecological) realities of life.

Language of power: When asked why one should study economics, one of the students “talked of wanting to learn the language spoken in the highest spheres of power today.” (page 35)

The Econocracy: “Sceptical students will be met with the catch-all that all theories make assumptions (more on this later), or are told that if they go on to do a PhD (which most of them won’t) then the assumptions will eventually be dropped.” (page 36)

The Econocracy: “Economists will plead that these are only basic models which are developed in more advanced study, but many students may not go much further in studying economics, so these are the ideas [i.e. undergraduate curriculum] that will shape how they think about the economy.” (page 81)

Note: In his article “Teaching Unsustainably?” (2013) Tom Green tells a very similar story (i.e. complete indoctrination in undergraduate study) for economics education in North America.

The Econocracy: “In our own studies we clung to the belief that we were learning a framework that we might begin to apply to the real world in the next course or in the next year. It wasn’t until halfway through our degree that we realised that we might be waiting in vain.” (page 36)

Economics students learn only one particular type of economics (i.e. neoclassical economics), and they are taught to accept this type of economics in an uncritical manner. (page 37)

The Econocracy: “Critical and independent thinking is discouraged and there is little or no history, ethics or politics in economics courses.” (page 37)

Note: Ecology or anthropology is not mentioned here even by the critical authors of “The Econocracy” among the required disciplines.

The Econocracy: “... the emphasis on quantifiable aspects of economic wellbeing (what economists usually terms ‘welfare’) leads to a neglect of other components of well-being.” (i.e. over-quantification, premature mathematisation). (page 40)

The Econocracy: “By the time students leave education, they are wont to believe that any economic question must use neoclassical economics as its starting point.” (page 48)

The Econocracy: Today’s syllabuses don’t encourage students to step back and assess what they are being taught, but reward repeated regurgitation and conformism. This amounts to nothing less than indoctrination into the neoclassical way of thinking about the economy.” (page 54)

The Econocracy: Of all 172 module course outlines reviewed, only 17 modules and two core modules mention non-neoclassical economic perspectives, while Cambridge University does not mention them at all. Modules that do mention other perspectives are usually pushed toward the fringes as they are non-compulsory, or students are discouraged from taking them.” (page 61)

The Econocracy: “In the UK income inequality increased in the 1980s [neoliberal Thatcher era] and has remained at historic highs ever since. ... Neoclassical economics takes an abstract, almost hands-off approach to inequality, which makes it easy to miss it entirely. ... Questions of institutions, power and politics are rarely addressed ...” (page 77)

The Econocracy: “... the ‘perfect market’ is still the focal point of their thoughts. When perfect market is the norm and market failure is the exception, the exceptions [e.g. externalities] can be dismissed.” (page 82)

8) Neoclassical economics is based on a mechanistic and atomistic view of the world (e.g. individualistic independent decision taker and rational utility optimiser Homo Economicus).

The Econocracy: “Neoclassical economics therefore has an atomistic view of the world, and tries to build an understanding of the economy as a whole from the decision of individuals.” (page 38)

### ***The Econocracy: Economics Education in UK (Great Britain & Northern Ireland)***

1. Uniform (standard) economics education across all seven studied universities: London School of Economics (LSE), Sheffield, Exeter, Cambridge, Glasgow, Manchester, Queen’s University Belfast (QUB)

The Econocracy: “Widespread in the scientific toolkit of neoclassical economics means that the content of economics education across the seven universities we studied was remarkably uniform. ... Our curriculum review shows that both macro and micro courses are taught in similar ways across the country (UK).” (page 40 & 41)

The Econocracy: “Undergraduate economics today undermines **liberal education** [i.e. education in the broad sense for capable and cultivated human beings who can participate in democratic life] with its narrow focus on employability [and salary].” (page 125)

The Econocracy: “The historical wealth of Cambridge and Oxford means that now, of all the universities in Britain, they are best placed to provide students with a liberal education. ... However, our curriculum review showed that the actual content of Cambridge modules was very similar to content at other universities, and there were very few references to non-neoclassical perspectives.” (page 124)

2. Microeconomics education is based on abstract mathematical theories and utility-maximizing “rational consumer” (Homo economicus) assumption.

The Econocracy: “Yet economic teaching of microeconomics is almost universally abstract and mathematical. ... Microeconomics modules at every university in our curriculum review centre on individual consumers (consumer theory) and firms (producer theory). ... The most basic world of microeconomics ... is a smoothly functioning world where everyone behaves rationally and has all the relevant information, and function perfectly, resulting in a socially optimal outcome.” (page 42)

Note: Economy is limited to consumers and firms only. Nonmonetary reproduction (i.e. production and recycling) of nature and society is totally ignored.

3. The logic of neoclassical microeconomics deeply influenced government policies. For example, The Green Book produced by the Treasury postulates that two main rationales for government intervention in the market are efficiency and equity. That is, other criteria like health and sustainability are either ignored or downplayed.

The Econocracy: “The Green Book ... stresses from the outset that the two main rationales for government intervention in the market are efficiency and equity. It then specifies the use of CBA [Cost Benefit Analysis] to determine different ways of achieving this rationale.” (page 43)

4. Macroeconomics education is also based on abstract mathematical models.

The Econocracy: “It is therefore surprising that instead of giving students a historical and empirical understanding of these issues [e.g. short-term economic fluctuations, unemployment, inflation] macroeconomics classes also focus on abstract models.

5. Macroeconomics classes deal primarily with (a) how countries can sustain long-term economic (GDP) growth, and (b) how countries can control short-term economic fluctuations.

The Econocracy: “Long-term growth models are based almost entirely on a model known as the Solow Growth Model which is featured at every university in our review. ... Essentially, this theory [Endogenous Growth Theory] states that long-term sustained growth can be achieved by boosting skill levels and improving technology. Such theory is the backbone for the current focus within government policymaking on improving education and skills which has influenced higher education policy in important ways. [i.e. technology oriented industrial education]” (page 43-44)

6. Textbook teaching: Highly standardised textbooks play a dominant role in economics education by shaping and limiting the scope of inquiry.

The Econocracy: “In economics, by contrast [i.e. compared to other social science courses], textbooks play a dominant role ... Students are rarely required to take independent research and, as a student aptly stated, ‘the textbook is the bible’. When students are pointed toward literature, it remains firmly within the realms of the neoclassical perspective.” (page 45)

The Econocracy: “The textbook is considered to be the crystallisation of the economic toolkit and what isn’t included becomes irrelevant to the modern discipline.” (page 46) Note: Fields like anthropology or ecology are not included in economics textbooks.

The UK market is dominated by a few textbooks, like:

Microeconomics: Hal Varian (primary textbook in five of seven universities), Hugh Gravelle and Ray Rees (in three of seven universities).

Macroeconomics: Greg Mankiw (in all seven universities), Stephen Williamson

**7. Ecology** is virtually absent in undergraduate economics education. (Section “The Environment” on page 70)

The Econocracy: “The environment represents a fundamental challenge to neoclassical economics. As a complex system whose components are not necessarily quantifiable [and separable from the whole], it doesn’t lend itself to the simple and mechanical relationships ...” (page 71)

The Econocracy: “The environment is virtually absent from basic economic analysis. Worryingly, of the 23 Russel Group universities (→ [Russel Group: Our universities](#)) that have economics departments, only nine have separate ‘environmental economics’ modules. ... The majority of students will therefore without even attempting to gain a systemic, in-depth understanding of how economics is linked to the environment.” (page 71)

Note: Generally, environmental economics is based on a worldview of shallow ecology (i.e. nature as an external entity that provides ecosystem services) and it accepts most of the foundational assumptions of neoclassical economics.

The Econocracy: “Environmental economics incorporates the environment into neoclassical economic analysis, which justifies policy intervention on the basis that market is failing to value the environment” due to two primary reasons (page 71):

a) Environment provides free (nonmonetary) economic benefits like natural resources and ecosystem services (e.g. ozone layer, rainforests, coral reefs, climate stability, clean air and water, fertile soils etc.) that will be overexploited due to short-term profit and power seeking.

b) Environment is often undervalued and over-exploited because private agents don’t take into account the (social & ecological) costs of environmental degradation, as they are borne by someone else or future generations; environmental destruction (i.e. ecosystem mutilation, externalities) as just another mechanism for “privatisation of profits, socialisation of costs”.

The Econocracy: Interventions proposed by environmental economics “involve attaching money values to the environment [i.e. pricing everything] and the Cost-Benefit Analysis (CBA) plays a central role in weighing up the various benefits of the environment and the costs of associated interventions.” (page 71)

Other models often used are DICE (Dynamic Integrated Model of Climate and the Economy] and FUND (The Climate Framework for Uncertainty, Negotiation and Distribution) to predict the monetary damage to global economy due to climate change.

The Econocracy: “The limitations of these approaches stem from the practice of trying to assign a monetary value to something broad and multifaceted as the environment and to climate change.” (page 71, pricing everything and monetary reductionism).

Another fallacy is reducing important ethical discussions to technical calculations. Typical examples of such scientific sounding technical tools are Cost Benefit Analysis (CBA) in combination with “discount rate”:

The Econocracy: “The rationale behind discount rate is that “people value the present more than the future, so environmental damage in the future must be reduced to find the equivalent cost today. ... The bottom line is however, is that the application of the discount rate signifies a contentious ethical choice obscured by technical language.” (page 73)

Knowledge of complex living systems and deep ecology recommend **precautionary principle**, whereas environmental economics (based on shallow ecology) insists on ill-informed cost-benefit trade-offs, as if there could be an economy without sufficiently stable ecosystems:

The Econocracy: “The result of these difficulties [i.e. complexity, unpredictability, nonlinearity] is that climate scientists recommend a precautionary approach over cost-benefit trade-offs, setting physical targets such as preventing a rise in global temperatures above 2 °C.” (page 74)

Following statement of influential economist Richard Tol shows the degree of ecological ignorance that dominates mainstream economics:

The Econocracy: Taking outcomes of crude and mechanistic models like FUND literally, Tol argued that “the idea that climate change poses an existential threat to humankind is laughable ... half a century of climate change is about as bad as losing one year of economic growth.” (page 74)

8. Unlike environmental economics (based on shallow ecology), **ecological economics** (based on deep ecology) has a critical stance about neoclassical economics; it doesn't accept many foundational assumptions of neoclassical economics. Environmental economics fails to see that human economy as a whole is embedded in the ecosystem (page 75).

The Econocracy: “This approach [of ecological economics] implies that there may be physical [and ecological] limits to economic growth and has led ecological economists to explore how no-growth [or **degrowth**] economies could work. The idea that [GDP] growth might not be possible or even desirable is anathema to most neoclassical economists because it is a foundational principle of their framework.” (page 74)

Human-centred and reductionist (i.e. mechanistic and monetary reductionism) worldview of neoclassical economics:

The Econocracy: “Philosophically, the neoclassical framework only judges the environment to be valuable if it impacts on humans (with impact judged by the assignment of a monetary value) whereas the ecological framework sees the environment as valuable in and of itself.” (page 76)

The illustrative case of at Manchester University: There is a climate change module designed for the discussion of climate change from the perspective of an economist. The only perspective to learn is but the perspective of neoclassical economics. “... the course teaches efficiency, cost-benefit analysis (CBA) and utility maximisation, and then applies them to environmental issues. Only 6% of the available exam marks are for evaluating a theory, while the rest are merely for operating a theory of policy. There is no mention of ecological economics, or any other alternative perspectives.” (page 76)

9. The establishment of neoclassical paradigm and institutional barriers to other paradigms like broader social and ecological perspectives:

The Econocracy: “The main reason for this shift [i.e. elimination of broader and alternative perspectives] is that non-neoclassical economists have been systematically excluded from economics departments across the UK. ... In the UK the Research Assessment Exercise (RAE), first conducted in 1986, has created an institutional system that has gradually cleansed economics departments of



academics who don't follow the neoclassical research agenda. The RAE is changed to the Research Excellence Framework (REF) in 2014..." (page 100)

University ranking for funds as a barrier (i.e. influence of money in education):

The Econocracy: "Universities realised that to gain high research rankings in neoclassical economics they needed to hire and promote economists who either published or would publish in the top-ranked, mostly American, neoclassical economics journals in order to bring in the most funding." (page 102)

The Econocracy: "Through this lens [i.e. to secure funding and ranking] it makes sense to hire only mainstream neoclassical economics. As early as 1994 the University of Manchester was advertising in the Guardian newspaper specifically for 'mainstream economists' who could help boost their research profile." (page 102)

The Econocracy: "Attempts to reform economics face many institutional constraints. By hiring economists from outside the mainstream of neoclassical economics, departments might perform worse in future Research Excellence Frameworks (REF). This translates into lower rankings in league tables and as a result, potential students go elsewhere." (page 128)

In chapter "Higher education as a sausage factory", The Econocracy explains further how the Higher Education has become narrower and narrower over time in UK since 1946 (i.e. training for job instead of a broader liberal education). This story is very similar to the developments in USA (see Wendell Berry and Christopher Lasch).

University business models and rankings as institutional barriers: "Successful university business models don't aim to provide good-quality [liberal] education; they aim to maximise student satisfaction, the institution's place in research rankings and applications from international students. (page 133)

10. Criticism about the reform initiative of CORE (see [www.core-econ.org](http://www.core-econ.org), economics for a changing world):

The Econocracy: "In this sense [i.e. teaching neoclassical economics in a more engaged and up-to-date manner] CORE has striking similarities with previous reform efforts that occurred in economics during the 1980s in the USA [neoliberal Reagan era]." (page 111)

The designers of CORE argued that "we need reform in the way economics is taught, but not a revolution." (page 112)

The Econocracy: "CORE continues in the tradition of believing that only one perspective is valid in economics [i.e. not really pluralist]" (page 112)

Note: Unorthodox economists like Thorstein Veblen, Nicholas Georgescu-Roegen or Herman Daly are not mentioned among "great economists". Positives: Karl Marx and Elinor Ostrom  
<https://core-econ.org/the-economy/book/text/0-7-resources-list.html#great-economists>

The Econocracy: "Importantly, students are not encouraged to question neoclassical economics anywhere in the CORE syllabus. The three prongs of neoclassical economics ... (individualism, optimisation and equilibrium) are simply accepted as true throughout. ... (page 113)

The Econocracy: "As it does with economic theory, CORE interprets historical events from only one, contested perspective without acknowledging that it is doing so. Chapter-1 opens by discussing the Industrial Revolution, arguing that technological progress and capitalism caused a hockey-stick-shaped take-off in economic growth. The focus is on 'the economy' as a separate, self-sustaining process. ... This narrative leaves the student believing that at one time 'the economy' took off and

there has been no going back since [i.e. Western ideology of continuous and limitless progress].” (page 113)

CORE: Unit 1 – The Capitalist Revolution (accessed on 6.12.2020)

<https://core-econ.org/the-economy/book/text/01.html>

Note: Issues like imperialism and exploitation are not mentioned at all. For example, how the British Empire exploited India. There is but a single bullet point about environmental degradation and inequality:

“This process, which we call the capitalist revolution, has been accompanied by growing threats to our natural environment, and by unprecedented global economic inequalities.”

The term “technological progress” is repeated several times as if it an undisputed fact of history, without ever warning about destructive and exploitative technologies like industrial fishing or farming.

The Econocracy: “The CORE curriculum shows that the rejection of other approaches is deeply embedded in the discipline. ... In 2015, a paper found that %57.3 of economists disagreed with the statement ‘in general, interdisciplinary knowledge is better than knowledge obtained by a single discipline.’” (page 115)

11. There has been some significant curriculum reforms at Greenwich, Kingston and Goldsmith universities despite difficulties like path dependency.

The Econocracy: “Integrating pluralism into syllabuses is difficult; the discipline is defined as neoclassical economics, and so universities feel that they must focus on this to allow their students to go on to postgraduate study at prestigious institutions. However, universities like Greenwich are pathfinders in hiring new staff, redesigning courses and changing assignment procedures.” (page 127)

### **C.5. CSEP Survey of Economics Students: Is it Time for Change at Cambridge? (2014, UK)**

<https://drive.google.com/file/d/14jYq-SlkwL4ns4Xx4-eInjQlulC3h2c0/view>

CSEP: Cambridge Society for Economic Pluralism

OIKOS: “A survey of current and former Cambridge economics students which found that respondents wanted more real word applicability, interdisciplinary, and career skills.”

From “Introduction” on page 4:

“The Institute for New Economic Thinking has funded the CORE programme, which is producing online materials for a new introductory economics curriculum. UCL will adopt this programme in the next academic year. Manchester University is implementing new courses in response to a student petition calling for a more pluralist curriculum. The University of Chile is overhauling its entire economics curriculum after a vigorous student campaign.”

“As one of the world’s leading universities Cambridge has a duty to consider its position relative to these issues. We, the Cambridge Society for Economic Pluralism (CSEP) decided to take the initiative to determine whether the Cambridge curriculum is fit for purpose.”

*Noteworthy points:*

- (1) Survey question (page 6): Would you like to learn more about the following?
  - understanding economic reality (85%) max of all choices

- (2) Survey question (page 7): What was your motivation for studying economics?  
 - to make the world a better place (62%), understanding of the current affairs (71%)

“Students expressed a desire to see the mathematical notation and theoretical models of the microeconomics and macroeconomics courses reduced and replaced with more policy relevant and intuitive thinking.”

- (3) Survey question (page 8): Would you find the option to take electives in another department useful? Majority (about 70% said Yes)  
 The students who answered affirmatively reported the following subject areas of interest: ... Politics (62%), philosophy (42%), psychology (36%), ..., history (33%). Note: **Ecology is missing (!!!)**

From “Conclusion” on page 11:

The survey results show that the Cambridge economics curriculum is falling short of students’ needs. It is not offering adequate means to understand the real-world economy. It is not providing reasonable opportunities for engagement with related disciplines and schools of thought. And it is not equipping students sufficiently with key skills they will need in their careers. To fully address these issues will require a comprehensive review of the economics curriculum.

Real-world and empirics at centre-stage: “... providing a deep knowledge of economic history; starting with empirics before moving to theory; **teaching about inequality and the environment**; teaching market failure rather than perfect competition as the baseline case”

Interdisciplinary context: “Teach economics in the context of its links to other disciplines and incorporate the perspectives and methodologies of alternative schools of economic thought (e.g. encouraging students to take courses in other faculties; emphasising its links to ethics, **politics and history**; discussing competing schools of economic thought).”

## **C.6. Economics, Education and Unlearning: Economics Education at the University of Manchester (PCES - The Post-Crash Economics Society) – 2014 (UK)**

<https://drive.google.com/file/d/1bXo8ZOyqmjWkfz-p6-meoJXM9h1MfkB0/view>

OIKOS: “This 60-page report details the Post-Crash Economics Society’s critique of economics education at the University of Manchester. It analyses the content of a Manchester economics education, builds an argument for pluralist reform, and lays out a set of specific suggestions to improve the degree. It also provides a set of principles which a pluralist economics degree should be built around.”

This is a well-structured, persuasive and comprehensive report that can be used as a model document for many other universities of the world. Some of its arguments may be specific to UK and University of Manchester, but many arguments are quite universal, like the dominance of neoclassical paradigm in education and research.

*The structure of the report:*

- FORWARD BY ANDREW HALDANE: THE REVOLUTION IN ECONOMICS 3
- EXECUTIVE SUMMARY
- INTRODUCTION
- SECTION 1: WHAT’S WRONG WITH ECONOMICS EDUCATION AT MANCHESTER?
- SECTION 2: ANALYSIS OF CORE MICRO AND MACRO MODULES
- SECTION 3: THE FORMATION OF THE STATUS QUO AND ITS REPRODUCTION
- SECTION 4: RESPONDING TO ARGUMENTS AGAINST CHANGE

- SECTION 5: THE COMPELLING CASE FOR REFORM
- SECTION 6: REAL CONSTRAINTS TO CHANGE AT MANCHESTER
- SECTION 7: PRINCIPLES OF A POST-CRASH ECONOMICS EDUCATION AND SOME PRACTICAL REFORMS
- CONCLUSION: WHY IS THE CRISIS SO IMPORTANT?
- APPENDIX 1: RESPONSE TO THE INSTITUTE FOR NEW ECONOMIC THINKING'S CORE PROGRAMME

Some quotations from the report and my comments related with ecological literacy:

#### FORWORD BY ANDREW HALDANE: THE REVOLUTION IN ECONOMICS

“Not surprisingly, the mathematical techniques used to derive and solve these models were also a straight lift and shift from theoretical physics. And, to complete the **physics-envy**, economists’ methodological approach was explicitly deductive.”

Haldane points to the dominance of quantitative analysis that often comes at the cost of broad-viewed qualitative analysis...

“The [2008 financial] crisis has also laid bare the latent inadequacies of economic models with **unique stationary equilibria and rational expectations**. These models have failed to make sense of the sorts of extreme macro-economic events, such as crises, recessions and depressions, which matter most to society.”

Not explicitly mentioned, but “crises” should include social and environmental crisis like the climate change.

“Reciprocity and fairness are centre-stage. ... The good news is that there are signs economics may be going back to the future. ... Smith is being rediscovered in his true colours – as political scientist, sociologist and moral philosopher. This is evidenced in the upsurge in interest in integrating the insights from other disciplines into economics: history, psychology, **anthropology, evolutionary biology**, sociology and neuroscience, to name but six.

The term “evolutionary (social and biological) anthropology” plus philosophy would cover all these disciplines required by a holistic and pluralist economic analysis. As Veblen said, political economy should be an evolutionary human science.

“Four years ago, **George Soros set up the Institute for New Economic Thinking** (INET) to stimulate a refresh and reset of the economics discipline and, within that, economics teaching. Two years ago, **Gregory Mankiw’s undergraduate economics class** at Harvard walked-out at the narrowness of the curriculum. Here in the UK, Wendy Carlin from UCL is leading a project [CORE] to reform the economics curriculum among a number of UK universities, with sponsorship from INET. These are all encouraging steps in the right direction.”

There is a critic of CORE at the end of the report, which says, CORE is not much more than mainstream (neoclassical) text slightly enriched by empirical data and history; not really a pluralist body of knowledge which is open to alternative schools of economic thoughts.

#### EXECUTIVE SUMMARY

“Our economics education has raised one paradigm, often referred to as **neoclassical economics**, to the sole object of study. Alternative perspectives have been marginalised. This stifles innovation, damages creativity and suppresses constructive criticisms that are so vital for economic understanding. Furthermore, the study of ethics, politics and history are almost completely absent

from the syllabus. We propose that economics cannot be understood with all these aspects excluded; the discipline must be redefined.”

These arguments are remarkably similar to the arguments of [Open Letter](http://www.isipe.net/open-letter) (International Student Initiative for Pluralism in Economics) signed by 65+ student associations.

<http://www.isipe.net/open-letter>

“On a national level the **increasing narrowness of economics** has led to the technicalisation of economic debate. Economic policies are scientific truth as opposed to the prescriptions of one paradigm discipline stifles innovation and leads to hubris.”

“In short, we argue for **pluralism** of perspectives and the inclusion of ethics, history and politics. Reform must come from individual universities and from national bodies such as the Higher Education Funding Council for England (HEFCE).”

#### *Key findings:*

“Economics education at Manchester has elevated **one economic paradigm**, often called neoclassical economics, to the sole object of study. Other schools of thought such as institutional, evolutionary, Austrian, post-Keynesian, Marxist, feminist and ecological economics are almost completely absent.”

“**History of economic thought** is an optional third year module which students are put off taking due to it requiring essay writing skills that have not been extensively developed elsewhere in the degree. Very little economic history is taught.”

“Syllabuses are almost homogenous at many English universities. Widespread support for our society in Manchester and the emergence of similar societies at ten universities around the country shows that many are frustrated with the current situation.”

“Fifteen years ago, the Economics Department at Manchester was pluralist and alternative perspectives and economic history had a far greater place on the syllabus.”

“A significant cause of this great narrowing is how **research funding** (REF) in economics is allocated. The **journals** that are highly ranked espouse a neoclassical perspective and as a result, universities like Manchester, whose central aim is to climb the research rankings, will only hire academics that adhere to this school of thought.”

Research funding (by state or business), high-ranked economic journals, established ideology of a single neoclassical paradigm and university rankings seem to be serious obstacles to a fundamental reform in economic teaching.

Surprisingly, the problem (i.e. monocultural narrow view) has even been exacerbated within the last 15 years at the University of Manchester, despite all critical student movements since 2000.

#### INTRODUCTION

“The **Post-Crash Economics Society** was set up by the students of the University of Manchester in December 2012 to campaign for changes to the syllabus and teaching of

economics at the University of Manchester. ... Our aim as a society is not just to criticise the status quo but also to engage constructively with the Economics Department and the University of Manchester to identify **realistic and practical reforms**.”

“In this report, we focus on economics education at the University of Manchester. However, it is important that we emphasise that the problems we identify are certainly not limited to Manchester and are in fact **international in scale**. An Institute for New Economic Thinking (INET) report illustrates



the relative homogeneity of economics education at the 12 leading universities in Britain and suggests that the findings of this report are relevant to universities around the country (Wigstrom, 2011)”

## SECTION 1: WHAT’S WRONG WITH ECONOMICS EDUCATION AT MANCHESTER?

“However, competing definitions of economics could easily be offered:

- Social reproduction – how does a firm, family, society reproduce itself? (the classical definition)
- The study of production, distribution and exchange (neoclassical economics typically focuses only on the latter)
- The study of markets and the enterprise system; and
- The interactions between exchange, culture and gender.”

“The study of production, distribution and exchange”: recycling is missing; production + recycling = reproduction

“The study of markets and the enterprise system”: Note that, nature as the primary producer and recycler is missing even in such a critical minded report. Apparently, the influence of the *business realm* (firms, markets, state, consumers, households), which excludes nonmonetary reproduction of nature and society, has become a dominant focus in economic thought.

“(4) There is little economic history and one optional third year history of economic thought module. ... At the extreme, a theory of how **hunter-gatherers** organise themselves would clearly differ from a theory of capitalism. However, even within capitalist theories, welfare state capitalism might function differently to laissez-faire capitalism, or ...”

For every economics student, it is important to understand that different societies may have totally different values, ideals and lifestyles. So, there is not a single direction of progress –as implied by neoclassical economics with ostensibly objective, scientific and value-free terms like economic development and growth-- that can and should be taken by every society in the world. Accordingly, it doesn’t make much sense to talk about “living standards”, as if there were such standards for every society.

“(5) There is little to no emphasis on the **ethics, philosophy and politics** of economics. ... Economists often proceed with their analysis as if it is a purely quantitative, value-free and scientific enterprise. However, we do not believe this is possible, as questions about the economy inevitably involve value judgments. ... Currently **value judgments** are implicit within the theories we are taught: for example, **efficiency and growth** are generally presumed to be a good thing.”

Economic growth is often presumed to be much more than a good thing; GDP growth is often promoted as the “ultimate goal” of all economic policies of a country, thereby obfuscating all pluralist, qualitative, democratic discussions about the complex outcomes of economic policies with a single abstract number: GDP

“(7) It doesn’t place emphasis on developing the tools [like multi-disciplinary knowledge] to be able to critically evaluate economic theory and the lack of pluralism prevents critical comparison. ... The result is that ‘economics’ as it is currently taught unjustifiably emphasises its **scientific status**.”

It can safely be hypothesized that neoclassical paradigm –like many other paradigms-- will tend to reject (i.e. ignore, neglect, devalue, discredit) every kind of conflicting information that may endanger its internal consistence, hence scientific status. For example, the idea of continuous and limitless progress is in conflict with ecology, and with the findings of modern anthropology.

## SECTION 2: ANALYSIS OF CORE MICRO AND MACRO MODULES

“Micro and Macro Principles are a **delivery of neoclassical theory** and students are expected to learn the theory by rote. There is no mention of what school of thought is being taught or that there are any other schools of thought. It is presented as facts about the world which leads to the possibility of students believing that these ideas represent indisputable truths.”

“The University of Manchester provides **12 undergraduate micro and macro modules** which make up a quarter of modules available. These modules are the backbone of an undergraduate economics degree at The University of Manchester.”

“The modules ‘History of Economic Thought’ and ‘Property and Justice: From Grotius to Rawls’ do significantly differ from the core Micro and Macro modules but they are third year optional modules. This means that, as these two new topics are introduced at the last stages of the degree very few economics students are prepared to take them.”

### SECTION 3: THE FORMATION OF THE STATUS QUO AND ITS REPRODUCTION

“As little as **15 years ago** the Economics Department at Manchester had a considerably wider range of professors who self-identified with different economic paradigms and had very different research agendas.”

“The Power to Define what is and isn’t Economics: The **Research Excellence Framework** (REF) and **academic journals** have the power to define what is and isn’t economics and within that, what is good economics and bad economics. REF determines how much research funding each university gets... The outcome of the REF rating process is to elevate the neoclassical framework to the standard by which all economics research is judged.”

“The Great Narrowing: The Department at Manchester is becoming more homogenous over time. As non-mainstream Manchester professors have retired from expanding departments they have been replaced by young recruits. These recruits represent a narrow range of mainstream economists who had been published, or were more likely to be published, in the **mainstream American Journals** (Big 5: AER, Chicago etc).”

“There is a **culture of active hostility** towards professors who don’t follow the dominant desirable research agenda. ... The recruits which replace them are young and orthodox products of a PhD system dominated by orthodoxy economics. ... This process is supported by the technicalisation of mainstream economics. In the mainstream of economics, quantitative methods and algebraic formalisation have supreme status whilst qualitative approaches are deemed inferior.”

### SECTION 6: REAL CONSTRAINTS TO CHANGE AT MANCHESTER

Institutional, economic and cultural constraints:

- Research Excellence Framework (REF): Adherence to narrow neoclassical paradigm in the pursuit of higher rank
- Lack of resources: Using the r
- Relatively cheap mass education of economics department as a cash cow for the whole university
- Academic competition for masters at top ranked university departments
- Unqualified lecturers (for pluralist education) due to the monoculture of neoclassical economics in department

### CONCLUSION: WHY IS THE CRISIS SO IMPORTANT?

“We ask that the University of Manchester provide a **formal response** to this report to outline areas which they agree with us and where they disagree with us. We also ask that they provide us a timetable for any economics education reforms they plan to make as a result of this report.”

Question: Did Post-Crash Economics Society (PCES) receive a formal response from the university?

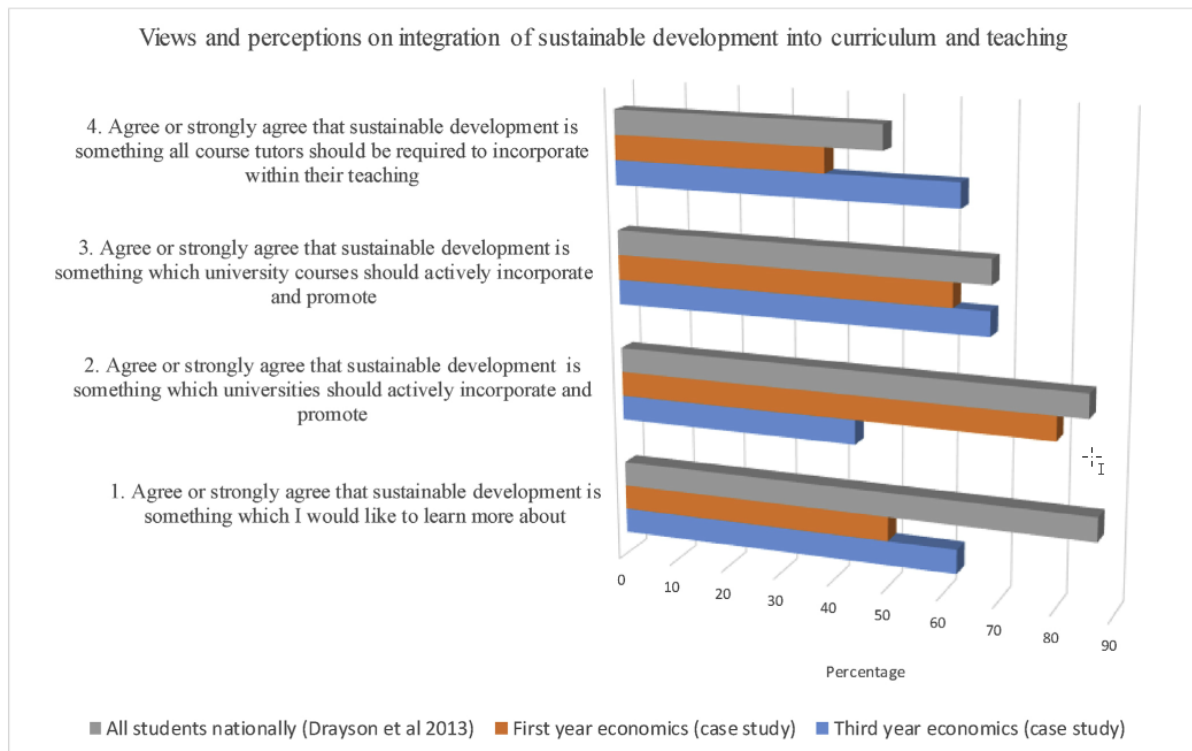
### C.7. Integrating sustainable development into economics curriculum: A case study analysis and sector wide survey of barriers (2019), Peter Bradley (UK)

<https://blogs.uwe.ac.uk/economics-finance/integrating-sustainable-development-into-economics-curriculum/>

Purpose of the study: “The purpose of the paper is to conduct analysis of a department wide intervention to integrate sustainable development into economics at a case study University, the first of its kind. The study makes use of surveys, interviews and key word searches to provide both qualitative and quantitative data and findings. Results indicate integration of sustainable development into curriculum on some modules but not the majority of the sample, evidence of resistance was also found. A range of barriers to integrating sustainable development into curriculum were identified in interviews.”

According to this research, the majority of students perceive education of sustainable development as something desirable:

**Figure-9:** Sustainable development in education. Source: Peter Bradley



**Fig. 2.** Results on student factors.

Most important barriers to integration of sustainability into the curriculum and teaching:

Disciplinary boundaries (of industrial education): “I think that it is probably true of all disciplines that they are not thinking outside their own, but economics, my impression is that economics is even more like that than some others, because there is a very sort of a very monistic attitude towards how it is taught... Where as in other kinds of disciplines, they are not as dogmatic about how you do the discipline.” (interview with a teacher)

Narrow definition of economics: “... once you define economics as being about rational agents in equilibrium systems, and they are all maximising utility, then that really closes down the number of

questions that you can really ask and also it leads you into, the way of asking them is very formal, very mathematical, so by defining economics that narrowly, you've locked yourself in to a narrow way of thinking, and it's only going to get narrower, I think.”

Research Excellence Framework (REF): “... UK Research Excellence Framework leads to positive discrimination towards hiring mainstream neoclassical economists that tend to be less pluralist because 3\* and 4\* economics journal predominantly tend to be neoclassical reflecting the dominance of this training and representation in the profession.” Note: REF as an important barrier was also mentioned in “The Econocracy”.

Hubris of profession: “I think the other thing about it is hubris, this notion that we can look at other disciplines, but we only look at in terms of how can we help them get better at what they do, you know, this kind of economic imperialism, arguments of Gary Becker type.” (interview with a teacher)

Habits of thought: “... implementation is really hard, it's really hard to get people to engage, or perhaps change, be susceptible to change what they are doing, trying to think about things in a different way, it's hard to do that, especially when people have been teaching things for decades really...” (interview with a teacher)

Table 4 on page 343 (results of the survey on barriers) is quite informative in showing how opinions of mainstream and heterodox differ radically for certain questions like:

1. Are the fundamental assumptions of neoclassical economics helpful for integrating sustainability into economics curriculum?
2. Are the mainstream definitions of economics helpful for integrating sustainability into economics curriculum?

#### **C.8. A Survey of Undergraduate Economics Programmes in the UK, Christian Westerlind Wigstrom, INET UK Economics Curriculum Committee (ECC)**

[https://drive.google.com/file/d/1p304ye8f4VAiE\\_EyHTUn5YwdwgHWkGH/view](https://drive.google.com/file/d/1p304ye8f4VAiE_EyHTUn5YwdwgHWkGH/view)

Survey of the structure and content of undergraduate economics degree programmes in the twelve UK universities whose economics departments ranked the highest in the most recent Research Assessment Exercise (RAE 2008): LSE, UCL, Essex, Oxford, Warwick, Bristol, Nottingham, Queen Mary, Cambridge, Manchester, Royal Holloway and Southampton (RAE12 universities).

This survey focuses on single-honours economics degree; joint-honours programmes are beyond the scope of this survey.

With the exception of Oxford, all RAE12 universities offer three-year single-honours economics programmes. These programmes are generally marketed as leading to careers in finance and industry.

Economics programmes across RAE12 have a very similar degree structure, where microeconomics, macroeconomics, mathematics, and statistics form the core of the degree.

*First year:*

- Introduction to economics (possibly divided into separate micro and macro courses)
- Introduction to mathematical techniques for economists
- Additional courses (compulsory and optional, depending on university)

*Second year:*

- Intermediate microeconomics
- Intermediate macroeconomics
- Econometrics (not compulsory at Manchester)
- Additional courses (compulsory and optional, depending on university)

*Third year:*

- Four to six optional courses, sometimes including an independent research project
- a few universities have compulsory elements

Above: General structure of 3-year economics programmes from the paper

Additional lectures and activities, either optional or compulsory, around this core structure is specific to the university.

**The most common text books for first-year microeconomics include:**

- Frank, R. (2006) *Microeconomics and Behavior* (McGraw-Hill)
- Morgan, C., Katz, M., and Rosen, H (2005) *Microeconomics* (McGraw-Hill)
- Perloff, J. (2008) *Microeconomics: Theory and Application* (Pearson)
- Sloman, J. (2006) *Economics* (Prentice-Hall)
- Varian, H. (2006) *Intermediate Microeconomics* (WW Norton & Co)

Different universities use same books in different years.

It is not clear in the paper that the topic of “externalities” is handled in the compulsory lectures for microeconomics. Otherwise, there is not content about ecology, sustainability or anthropology within microeconomics.

**The most popular macro textbooks include:**

- Barro, R. (2008) *Macroeconomics: A Modern Approach (International Edition)* (Thomson South Western)
- Blanchard, O. (2005) *Macroeconomics* (Prentice Hall)
- Mankiw, G., and Taylor, M. (2008) *Macroeconomics: European Edition* (Worth publishers)
- Sloman, J. (2009) *Economics* (Prentice Hall)

LSE’s introductory macro module, which is regarded as representative in the paper, includes topics like measurement of the aggregate economy, unemployment, growth and development, Keynesian vs Classical controversies and macroeconomic policy issues.

Compared to microeconomics, macroeconomics contains more pluralism due to some policy controversies like Keynesian vs Classical.

Qualitative and reflective lectures: “Out of the twelve surveyed universities only two – Warwick and Cambridge – require their single-honours economics students to take courses in economic history. And only an additional five (LSE, Essex, Oxford, Manchester and Royal Holloway) even offer optional economic history modules.” That is, the remaining five universities even don’t offer optional courses in economic history.



Warwick is an exception with its first-year compulsory course in “world economy: history and theory”. Cambridge is unique in requiring its students to take a course in politics.

“LSE, UCL, Oxford, Bristol and Manchester offer optional courses in the history of economic thought.” The content of these lectures varies significantly between universities. It is not clear in the paper, whether ecological views are handled in these lectures; probably not.

LSE and UCL are relatively strong in qualitative courses (evolution of economic policies (LSE), philosophy of economics (LSE), ethics of applied economics (UCL)), whereas Cambridge has laid more weight in sociology.

“The course that stands out most among these qualitative courses is ‘Explanations in Economics’ at Nottingham.” Particularly, the course outline includes a topic like “what are the similarities and differences between economics and natural sciences such as physics?” Political Economy is offered as an optional course at Nottingham.

Quantitative vs Qualitative: “... even at universities offering qualitative courses, *good students* are pointed by their supervisors in the direction of quantitative options as a way of preparing them for further studies and careers in industry.” That is, qualitative lectures seem to have a lower prestige than their quantitative counterparts.

Conclusions of paper: “Single-honours economics degrees at the twelve surveyed UK universities share a large number of characteristics. They share a course structure with compulsory micro, macro and quantitative courses in the first two years, and a third year based almost entirely on options; they emphasise the mathematics on the micro side and the policy on the macro side; and they are almost entirely devoid of compulsory qualitative elements.”

Note: **Ecology**, or the “lack of ecology” is not mentioned in such a critical paper. This shows that ecology (i.e. nature as the primary reproducer) lies outside the scope of even many critical students and academicians of economics.

### **C.9. Pluralism in economics teaching in Germany – evidence from a new dataset, Hannes Fauser and Myriam Kaskel (2016)**

[https://drive.google.com/file/d/1qtwZovMGS\\_S44OI6Hvm-mp-R9oEAc0hF/view](https://drive.google.com/file/d/1qtwZovMGS_S44OI6Hvm-mp-R9oEAc0hF/view)

This paper investigates the content of Economics Bachelor's degrees at 54 German universities, and analyse which subject areas dominate the curricula, and how the pluralist and qualitative subjects are represented in the curricula. The research is based on the approach of the French students' initiative PEPS (2014).

German Network for Pluralist Economics: Netzwerk Plurale Ökonomik

<https://www.plurale-oekonomik.de/netzwerk-plurale-oekonomik/>

Das Netzwerk

<https://www.plurale-oekonomik.de/das-netzwerk/ziele-und-aktivitaeten/>

«Junge NachwuchsökonomInnen bekommen in Ihrer Ausbildung meist nur dieses eine Denkmuster – die neoklassische Modellökonomik – vermittelt, und auch danach sind DoktorandenInnen, Postdocs und ProfessorenInnen der VWL einem hohen Konformitätsdruck ausgesetzt. Die Lösung realer gesellschaftlicher Probleme rückt dabei im Schein mathematischer Objektivität und eines überhöhten Dogmatismus in den Hintergrund.»

In English: «Young up-and-coming economists are usually only taught this one thought pattern in their training - the neoclassical model economics - and even afterwards doctoral students, postdocs

and professors of economics are exposed to high pressure to conform. The solution of real social problems is pushed into the background in the appearance of mathematical objectivity and excessive dogmatism.”

Impulse für eine zukunftsfähige Ökonomik

<https://www.plurale-oekonomik.de/projekte/impulspapier/>

«Wir müssen Wirtschaft anders denken – menschlicher, gerechter, ökologischer!»

In English: «We have to think differently about the economy - more humane, fairer, more ecological!»

“In contrast, it [discussions about pluralist economics] attracted very little interest among scholars of the so-called neoclassical mainstream.”

Curricula in Australia: “A comprehensive country case study is supplied by Thornton (2013, pp. 129-176), who investigated degree programmes in economics in Australia, finding a **decline of plurality** between 1980 and 2011.”

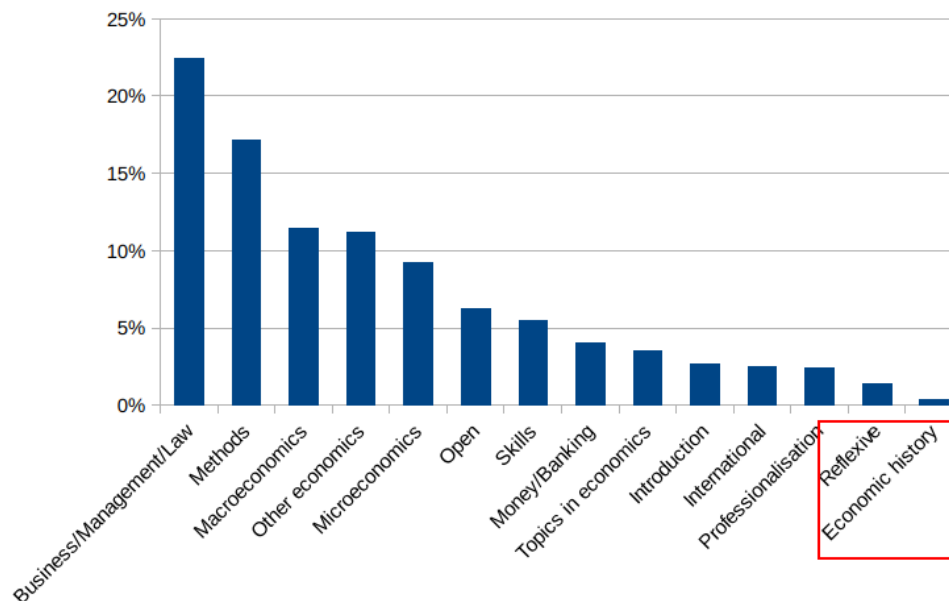
Curricula in USA: “While in 1980 15.8% of the institutions under scrutiny still required to take courses on the history of economic thought, the number decreased to 11% of the Arts and Science Colleges and 9% of the Business Colleges in 2013.”

Data from degree programme descriptions, and examination regulations for 54 curricula in economics at 54 German universities. “The selection of universities and curricula was carried out externally, under the framework of the “EconPlus”-project at the University of Kassel.”

### Summary

“The courses in German undergraduate economics degree programmes are dominated by the categories Business/Management/Law (22.45%), Methods (17.11%), Macroeconomics (11.43%) und Microeconomics (9.23%).”

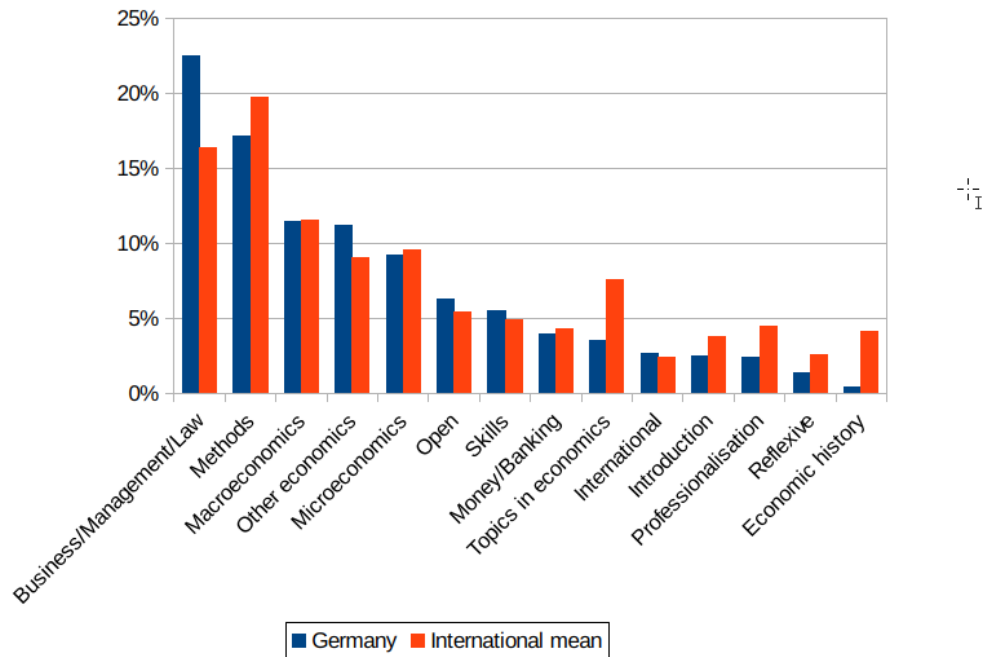
“In contrast, other categories are underrepresented, especially those which were most likely identified as plural: Particularly weak are Reflexive (1.36%) and Economic history (0.45%) courses. The subject area Open, which combines free electives and courses from neighbouring social sciences, is midrange (6.25%).”

**Figure-10:** Percentage of categories in German economics undergraduate curricula. Source: Fauser & Kaskel*Figure 1: Category shares, German economics undergraduate curricula*

Mean values for 54 curricula. Source: Own calculations.

Qualitative research: “Despite the high share of the Methods category, there was not a single course teaching qualitative methods in any of the obligatory modules.”

Compared to other 12 countries (Argentina, Brazil, Chile, Denmark, France, Israel, Italy, Mexico, Portugal, Spain, Turkey and Uruguay), “German universities offer little Reflexive und Economic history courses, but are above average for the Open category”.

**Figure-11:** Percentage of categories in international comparison. Source: Fauser & Kaskel**Figure 2: Category shares in international comparison**

International: Mean value over 13 countries, Germany: Mean value over 54 curricula. Sources: Jatteau (2016), own calculations.

**Figure-12:** Ranking in the category Reflexive (History of economic thought, Ethics, Philosophy of science, Epistemology). Source: Fauser & Kaskel**Table 3: Ranking in the category Reflexive (History of economic thought, Ethics, Philosophy of science, Epistemology)**

PLACE	WEIGHTED AVERAGE	MAXIMUM CREDITS TAKEN
1	<b>Frankfurt</b>	<b>Frankfurt</b>
	Bachelor of Science Wirtschaftswissenschaft Vertiefung Economics (9.75%)	Bachelor of Science Wirtschaftswissenschaft Vertiefung Economics (18.89%)
2	<b>Lüneburg</b>	<b>Mannheim</b>
	Bachelor of Science VWL (8.33%)	Bachelor of Science Wirtschaftswissenschaften (17.02%)
3	<b>Halle-Wittenberg</b>	<b>Oldenburg</b>
	Bachelor of Science VWL (7.16%)	Bachelor of Arts Wirtschaftswissenschaften (16.67%)

“Frankfurt comes in first twice, which indicates that the university's undergraduate economics curriculum has incorporated the biggest share of pluralist content of this category in its core.”

**Figure-13:** Ranking in the category Economic history (Economic history and selected economic problems).  
Source: Fauser & Kaskel

**Table 4: Ranking in the category Economic history (Economic history and selected economic problems)**

PLACE	WEIGHTED AVERAGE	MAXIMUM CREDITS TAKEN
<b>1</b>	<b>Siegen</b> Bachelor of Science Volkswirtschaftslehre (4.29%)	<b>Mannheim</b> Bachelor of Science Wirtschaftswissenschaften (15.96%)
<b>2</b>	<b>Tübingen</b> Bachelor of Science Economics & Business Administration (2.84%)	<b>Hohenheim</b> Bachelor of Science Wirtschaftswissenschaften (11.67%), <b>Berlin HU</b> Bachelor of Science Volkswirtschaftslehre (11.67%)
<b>3</b>	<b>Berlin HU</b> Bachelor of Science Volkswirtschaftslehre (2.62%)	<b>München</b> Bachelor of Science Volkswirtschaftslehre (10.00%), <b>Siegen</b> Bachelor of Science Volkswirtschaftslehre (10.00%)

**Figure-14:** Ranking in the category Open (Social sciences, general knowledge and free electives). Source:  
Fauser & Kaskel

**Table 5: Ranking in the category Open (Social sciences, general knowledge and free electives)**

PLACE	WEIGHTED AVERAGE	MAXIMUM CREDITS TAKEN
<b>1</b>	<b>Erfurt</b> Bachelor of Arts Staatswissenschaften Hauptstudienrichtung Wirtschaftswissenschaften (34.80%)	<b>Erfurt</b> Bachelor of Science Staatswissenschaft Haupttrichtung Wirtschaftswissenschaften (53.33%)
<b>2</b>	<b>Bamberg</b> Bachelor of Science European Economic Studies (28.44%)	<b>Würzburg</b> Bachelor of Science Wirtschaftswissenschaften (38.89%)
<b>3</b>	<b>Konstanz</b> Bachelor of Science Wirtschaftswissenschaften (24.62%)	<b>Trier</b> Bachelor of Science Economics and Finance (36.11%)

*Paper: Conclusions and outlook*

“We find that relatively few courses dealing with economic history (0.45%) or the philosophy of science, business ethics and other ‘reflexive’ content (1.36%) are part of the curricula on average. The interdisciplinary offer is somewhat bigger (6.25%), nevertheless all three categories combined still make up less than ten percent of the average curriculum.”

“German universities do particularly poorly for economic history and ‘reflexive’ courses, which are 89% and 47.8% below the international mean, respectively.”

“... Erfurt or Mannheim, take leading positions in several of the three categories. Others are represented strongly in some, like Humboldt-University Berlin and the University of Siegen for economic history, or the universities in Frankfurt and Halle-Wittenberg for reflexive courses.”

“It could be expected that a bigger plurality is present in the aforementioned curricula [major/minor structure at universities of applied sciences], on the one hand because minor subjects bring impulses from other disciplines. On the other hand, it is safe to assume that heterodox schools of economic



thought have survived rather at universities of applied sciences like the HWR [Berlin School of Economics and Law]” and Cologne.

Note: **Ecology** or environment is not explicitly mentioned anywhere in this paper.

#### **C.10. Pluralism in the economics curriculum in Germany (EconPLUS): An empirical study of offerings in introductory courses and of attitudes among teaching personnel (Germany)**

[http://plurale-oekonomik.de/econplus/EconPLUS\\_ENG.pdf](http://plurale-oekonomik.de/econplus/EconPLUS_ENG.pdf)

The central results of EconPLUS study (in German):

<https://www.pluralowatch.de/econplus/econplus/>

Summary report and downloads:

<https://www.pluralowatch.de/econplus/zusammenfassung-und-download/>

This study (Studie EconPLUS) was conducted by Prof. Dr. Frank Beckenbach, Dr. Maria Daskalakis und Dr. David Hofmann at the Department of Environmental and Behavioural Economics at the University of Kassel. The main purpose of this study was (a) providing scientifically documented information regarding the pluralism of economics in basic undergraduate courses (introduction to economics, microeconomics and macroeconomics) in Germany, and (b) investigating the possibilities for expanding the pluralism of these courses. For this study, a survey was conducted among economics teachers in 54 economics and business studies programs in Germany.

Some interesting statements and findings from the summary report in English:

Neoclassical economics as the dominant paradigm: “According to the respondents, this mainstream is characterized by concepts and methods that pertain to the intellectual framework of the **neoclassical school of economic thought**. The respondents identify the most relevant feature of the mainstream approach as the actor concept of **homo economicus as well as the categories rationality, equilibrium, maximization and efficiency**.”

There is a gap between willingness and application: “Surprisingly, publicly articulated criticism of many students is generally judged to be justified by the majority of the respondents and a more open perspective is held to be more appropriate. The results show, however, that this willingness in principle to have more pluralistic teaching in economics is not realized on a corresponding basis in actual teaching practice (**attitude-practice gap**).”

Textbook teaching: “The few terms which cannot be classified to the mainstream or orthodoxy appear much less frequently and do not reveal any particular conceptual correlation. This basic situation is also reflected in the content of the most frequently used textbooks. The standardization of course content and of the content of economics textbooks stand in a reciprocal relationship.”

Broad-view qualitative analysis is pushed to extinction: “... only very few universities offer courses with an “enhanced” view on a systematic basis dealing with the intellectual history of economics, with economic ethics or with the history of economics or philosophy of science as shown in the course modules.”

There is a statement in this report which I find particularly interesting:

“Today, this orthodoxy is located almost exclusively within the intellectual edifice of **neo-classical economics**. In this context, criticism is made not only that this approach neglects other schools of thought and issues outside the neo-classical tradition, but that it also neglects courses dealing with the

history of economic thought or philosophy of science. From a pluralistic perspective, there cannot only be a single dominant school of thought in economics, which is after all a **social science**.”

Why should the scope of economics be limited to social sciences? That is, why should natural sciences like biology, ecology and evolutionary (biological) anthropology be excluded?

*Central results of the survey of teaching personnel*

1. The vast majority of the surveyed teaching economists are of the opinion that a mainstream (i.e. neoclassical economics) does exist that excludes relevant economic concepts and theoretical approaches (sidestream)
2. “The majority of the respondents have a broad knowledge of the publicly articulated critique of the students. Half of the respondents see this critique as basically justified.”
3. “The amount of compulsory teaching material is cited as the main impediment to a greater diversity in the curriculum, followed by a lack of personnel resources, high work-loads as well as the basic orientation of the course of study.”
4. “Women are significantly more open than men for the critique of the students as well as for a resultant redesign of the curriculum.”

*Central results of the analysis of curriculum content*

1. “... course descriptions for the basic undergraduate courses are dominated by terms and concepts that fall within the purview of modern neoclassical economics.”
2. “Courses with a wider perspective, for example the history of economic thinking, history of economics, philosophy of science and ethics, are not a genuine part of the prevailing curriculum. Instead, they are offered only at isolated universities, if at all.” Note: Courses like ecology or evolutionary anthropology are not mentioned at all. This might be due to a-priori restriction of “social science”.
3. “Current teaching practice particularly neglects the educational interests of students who do not intend to remain in a university environment.”

*What should be done?*

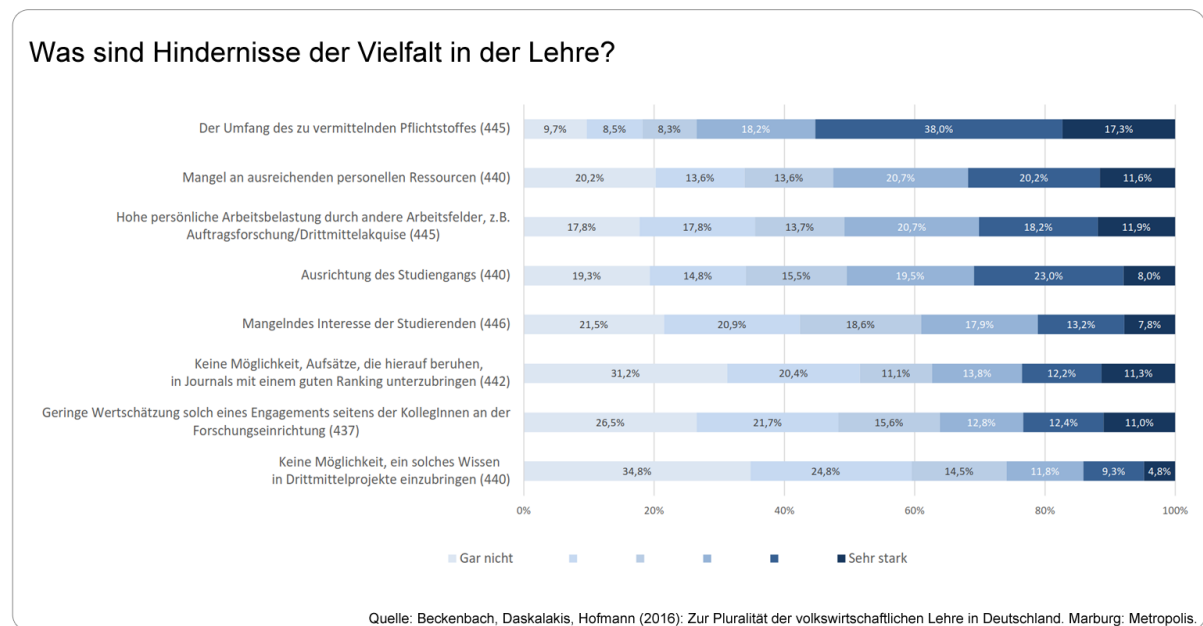
1. Promote of pluralistic attitudes in teaching personnel and develop pluralistic teaching materials
2. Increase the degree of choice in the curriculum; e.g. increase elective portion of the curriculum, or decrease compulsory portion, add new offerings with a wider perspective
3. This study can be extended to other countries, particularly to Austria and Switzerland (i.e. other German speaking countries of Europe).

Ergebnisse der Befragung (results of interviews with teaching staff)

<https://www.pluralowatch.de/econplus/econplus-befragung-lehrende/>

What are the barriers to implementing a pluralist economics education?

The main obstacle to diversity in teaching is the scope of the compulsory subject, followed by a lack of sufficient human resources, high workload and the orientation of the course.

**Figure-15:** Barriers to diversity in economics education. Source: EconPLUS

### C.11. The case for pluralism: what French undergraduate economics teaching is all about and how it can be improved, The Members of the PEPS-Economie Students' Association, 2014 (France)

<https://drive.google.com/file/d/1rbWi1BZvJZip71r0glwGG3QgxCWf5MGI/view>

#### Introduction

Even after the financial crisis in 2008, “undergraduate curricula are still largely dominated by strictly technical approaches, with little effort to make contemporary economic issues accessible to economics students.”

“... members of the PEPS-Economie students' association took a close look at all the courses offered by the French undergraduate economics curricula” at 54 universities in France.

The question is: “What does the typical French economics student learn in his/her three post-secondary years of study?”

#### No time to reflect

The history of economic thought (HET) only counts for 1.7% of all the classes taught; 15 universities do not even offer a single HET course.

#### Techniques for the sake of techniques

Quantitative approaches heavily dominate the education: “... we bemoan excessive formalism of economics training and the correlated implicit dogma of an alleged superiority of quantitative methods over qualitative approaches.”

Microeconomics, which is closely related to neoclassical theory, counts for 10.7% of all undergraduate courses. “Let us recall that neoclassical economists generally believe that markets are self-regulated and that economic agents are rational, two debatable assumptions causing them to predict that financial bubbles are impossible and that economic crises cannot last long!”

“Only 1.7% of all undergraduate classes are devoted to contemporary economic issues; 14 universities do not even offer such training.”

Current economic curricula don't leave room for sociology and political science classes. 1.8% of classes focus on social sciences other than economics; 18 (of 54) universities do not even offer such classes.

**Figure-16:** Types of courses and their average weights. Source: PEPS-Economie

**Table 1** Inadequate curriculum for economics education: average weight given to each subject taught in French undergraduate Economics programmes, as measured in the number of ECTS credits granted\*

Type of course	Average weight
Technical approaches [1]	43.0%
Working methodologies [2]	13.9%
Management	13.7%
Thematic approaches [3]	12.1%
Reflexive approaches [4]	5.5%
Others	4.7%
Interdisciplinarity	4.1%
Professionalisation [5]	3.0%

Notes: [1] Mathematics, statistics, microeconomics, macroeconomics

[2] Speaking and writing skills

[3] Labour economics, money and banking, international economics etc.

[4] Epistemology, economic history etc.

[5] Internships in the private or the public sector.

Principal Components Analysis (PCA): “Our results indicate that most bachelors in economics are rather homogenous and do not differ from one another.”

“Experience shows that the majority of economics students is not familiar with alternative approaches to economics, or worse, has never heard of them: economics and neoclassical economics are the same.” For those students, there is only one real and scientific economics which is neoclassical economics.

Gap between real world and economics: Most economics students have little knowledge about the subprime crisis, the consequences of global warming or tax reforms.

#### *A proposal for an alternative economics curriculum*

Proposed is a curriculum for a ‘pluralist economics’ bachelor’s degree based on three-fold pluralism: theoretical, conceptual, and disciplinary.

Questions and problems first, theories and tools follow; not vice versa: economics curricula should primarily focus on contemporary economic issues, and that tools and theories should be taught in a way that contributes to our understanding of such issues. Learning theories and tools within the context

Three-fold pluralism is required for analysing economic issues like unemployment with a pluralist view, from multiple perspectives:

- 1 *Interdisciplinary-methodological pluralism*: In addition to economics, we can also learn from sociology, philosophy, political science, geography, history, psychology, etc... Moreover, the methods of these social sciences should be incorporated into the economist's set of tools alongside quantitative methods.
- 2 *Reflexive pluralism*: A substantial space should be given to courses allowing a reflection on economics and its methods and assumptions themselves, such as history of economic thought and epistemology of economics.
- 3 *Theoretical pluralism*: Theories such as the Neoclassical Synthesis, New Keynesian Economics, Post-Keynesian Economics, Institutional Economics, Marxian Economics, Feminist economics, etc., should be taught.

Note: Ecology as discipline is missing in (1), interdisciplinary pluralism.

Object-oriented approach is required: Contemporary economic and social issues (like unemployment) should become the backbone of undergraduate economics education. "Contemporary economic and social issues are omitted from the economics curricula to the extreme point that some of us have not even heard of the current recession in our classes!"

Economics curricula should include some courses explicitly devoted to methods – both quantitative and or qualitative.

"A complementary course should be exclusively dedicated to the history of economic and social thought and to the history of economic and social facts." (See: Three goals of these course in paper)

*Toward an alternative pedagogy*

Interactive/participatory teaching style instead of one-way information delivery

"A pluralist economics education with proper technical skills will enhance students' employability as well as academic opportunities at the doctorate level."

## **C.12. FROM TERRIBLE TO TERRIFIC UNDERGRADUATE ECONOMICS CURRICULA: An evidence-based assessment of an intellectual disaster, and a proposal for an alternative approach to economics teaching, PEPS-Économie (2015, France)**

<https://drive.google.com/file/d/1CvOsyH2diYejNWuNu5ugtqA6Iv4gTdym/view>

This is a shorter, summary version of the PEPS-Économie (2014) report that proposes 3-fold pluralism as a solution for improving economics education.

Furthermore, this paper suggests "object oriented" (i.e. concrete economic problems of real-life like unemployment and financial crisis) education, and emphasizes the importance of learning theories critically in socio-historical context.

From the conclusions: "The near absence of reflexive approaches, the quasi-domination of quantitative methods and standard microeconomics and macroeconomics combined with the lack of theoretical, methodological and disciplinary pluralism has us intellectually frustrated and professionally helpless. More than ever, we need at the core of curricula, the three forms of pluralism – theoretical, methodological, and disciplinary – to become the standard in economics curricula."

Note: Issues like sustainability, environment or ecology are missing even in such a critical report.



### **C.13. WWF report: Sustainable Development in Economic Sciences Topics, Learning Methods and Competencies in Degree Courses at Swiss Universities (Switzerland, 2018)**

<https://www.wwf.ch/sites/default/files/doc-2018-07/2018-07-Report-Economic-Sciences-Summary.pdf>

“Swiss universities are bound by the principles of sustainability. They promote sustainability-relevant topics in teaching and research and the transfer of this knowledge to the public. In their operations, they strive to deal responsibly with the ecological and social environment.”

(Message on the promotion of education, research and innovation 2017–2020, Swiss Federal Council 2016)

Conclusion from WWF’s Point of View: “Sustainable Development is far from being adequately integrated into all Swiss economic science degree courses. This conclusion can be clearly drawn from the results of the survey.” (see survey results in paper).

*Interesting findings:*

- “University types: For all business administration topics, the proportion of sustainability topics treated rather extensively at universities of applied sciences (on average 43% of courses) is larger than for universities (on average 24% of courses).”
- “Fields of Study: In business administration courses (46%) the proportion of practice-oriented learning methods is twice as high as in economics courses (23%). The other fields of study lie in between: Business Administration/economics combination (28%) and Banking & Finance (36%).”

Because fields like Business Administration, Banking & Finance are handled as “economic sciences”, I find this WWF report not particularly informative about economics education. This WWF report does not seem to question one fundamental mistake of mainstream economics education: Reducing economics (i.e. study of economy) to business realm.

In 2019, WWF criticised Swiss universities for “inadequate commitment to sustainable development”: [WWF übt Kritik an Schweizer Hochschulen: Mangelhaftes Engagement für die Nachhaltige Entwicklung \(2019\)](#)

## **D. SYNTHESIS AND CONCLUSIONS**

### **D.1. Neoclassical economics as normal and conservative science that rejects serious criticism**

*Main ideas:*

1. Neoclassical economics tends to reject all conflicting theories and fields
2. This rejection may come in different forms: mental or institutional barriers; omission, undervaluation, belittlement, hostility...
3. This section summarizes neoclassical misconceptions and their causes in a structured way
4. Most neoclassical misconceptions and barriers can be explained by the lack of ecological literacy
5. Foundational barriers: industrial paradigm, ideology of progress, business interests, ecological illiteracy
6. Understanding all kinds of barriers is essential for devising a better economics education that can overcome all these barriers

Like every established discipline or belief system, neoclassical economics tends to reject all kinds of theories, sometimes even whole disciplines like evolutionary anthropology and ecology, if their knowledge causes serious conflicts with its core assumptions (Kuhn, 2012).

This rejection (i.e. **barriers**) may come in many different forms: Conscious or subconscious, ideological or institutional (Hunt & Lautzenheiser, 2011); in form of omission, undervaluation, belittlement, sometimes even wilful ignorance, contempt and hostility, especially if much more than a scientific argument is at stake, like social order, privileges, careers and money (Berry 1996, Afterword). In such cases, ostensibly scientific arguments become mere political tools for displaying on which side one stays.

In “The Structure of Scientific Revolutions”, Thomas Kuhn describes the attitude of a normal (i.e. established, mainstream) science as follows (Kuhn, 2012):

“Other problems, including many that had previously been standard [e.g. social justice, ethics, epistemology, history, ultimate goals in classical economics] are rejected as metaphysical, as the concerns of another discipline, or sometimes just too problematic to be worth the time.”

Kuhn argues further:

“A paradigm can for that matter, even insulate the community from those socially important problems that are not reducible to the puzzle form, because they cannot be stated in terms of the conceptual and instrumental tools the paradigm supplies.”

Interestingly, as if he had mainstream economics in mind as he wrote his book, Kuhn had also some comments on the problem of inverse fitting (i.e. trying to fit nature into the boxes of abstract models) which is so prevalent in neoclassical economics, like Homo economicus (i.e. utility-optimizing rational consumer):

“... that enterprise seems an attempt to force nature into the preformed and relatively inflexible box that paradigm supplies. No part of the normal science is to call forth new sorts of phenomena; indeed, those that will not fit the box are often not seen at all.”

Kuhn reminds us also that a paradigm will not simply collapse because of its failures, unless there is a new paradigm which is ready to replace the old paradigm. Unless there is a new widely acceptable paradigm, the established paradigm will continue its way with occasional patches, typically by incorporating new exceptions and caveats that will further complicate the theory. The issue of **externalities** (i.e. social and ecological side-effects of economic activities) is a typical example of such patchwork in neoclassical economics.

Thus, only criticising the core assumptions of neoclassical economics is not enough; at least the foundations, that is, main principles, assumptions and core body of the new theory needs to be formulated, which is supposed to serve ultimate goals like “sustainable well-being for all”, economic justice and equity and ecological stability much better than the old theory.

This is very much like politics; only criticizing the narrative of mainstream politics is not enough, a new narrative (i.e. a new paradigm) must be formulated which can replace the old one (Monbiot, 2017; → [YouTube video: Out of the wreckage](#)).

There are books like “A Guide to What’s Wrong with Economics?” (Fullbrook 2004) written by heterodox thinkers, that explain the misconceptions of neoclassical economics. There are also some well written books, articles and reports (e.g. [The Econocracy](#) by Earle, Moran, Ward-Perkins 2017) that criticise the theory and education of economics, and offer suggestions for improvement, like **three-fold pluralism** as a general framework in economics education (PEPS-Économie, 2015):

1. Interdisciplinary and methodological pluralism (broad-view)
2. Reflexive pluralism; i.e. questioning methods, assumptions, epistemology, history
3. Theoretical pluralism; i.e. teaching multiple schools of economic thought including critical ones like institutional and ecological economics

These are still relatively abstract principal suggestions, that explain how to teach, but not exactly “what to teach and in what order”.

There are initiatives like CORE (Economics for a Changing World at [www.core-econ.org](http://www.core-econ.org)) that attempt to design the core body of a pluralist economics teaching. Unfortunately, in many aspects like ecological literacy (required for sustainability) and theoretical pluralism (including critical heterodox schools), the current content of CORE falls short of a real reform in economics teaching (see criticism of CORE in [The Econocracy](#)).

This thesis is, among other things, an attempt to explain the causes of the misconceptions in a logical and structured way; i.e. what’s wrong in neoclassical economics and why? Beginning with ultimate goals of economic policies like “sustainable well-being for all”, further discussions about the misconceptions and their causes may help to devise the concrete content of a better economics education. We can begin by asking questions like:

1. What kind of education do we need to understand the principles of a sustainable community?
2. What kind of barriers do we need to overcome to understand sustainability? What kind of education do we need to overcome these barriers? How can we develop mental immunity against such barriers?

For example, how can we overcome an ideological barrier like the Western ideology of continuous and limitless progress? The information in Table-1 claims, we need first of all ecological and anthropological literacy to overcome the presumptions of the ideology of progress.

Modern anthropology tells us that the life-quality of hunter-gatherers were not necessarily worse than the life-quality of agricultural societies; in most cases, even better (Manning 2004, Scott 2017, Antrosio & Jason 2011). This discovery is but in plain conflict the Western ideology of progress which prefers to believe, life was “solitary, poor, brutish, nasty and short” before agricultural revolution, as famously claimed by Thomas Hobbes in Leviathan. For the Western ideology of progress, there was no civilisation at all before agricultural revolution, which is followed by industrial revolution as the next progression of humanity to a higher civilisation.

How can understanding barriers help us for devising a better economics education? How can we derive “required body of knowledge” from barriers and their possible causes?

This is not difficult if we can formulate the causes in terms of the “kind of ignorance” (i.e. ignorance of what?) that builds and preserves the barriers. For example, a claim like “industrial paradigm is caused by ecological ignorance” –if it is true-- would mean, we need ecological literacy (in the deep and broad sense) in order to overcome the limitations of industrial paradigm.

Thus, understanding misconceptions, barriers and their possible causes is essential for designing the content of a better economics education that can overcome such barriers. Misconceptions, that are also barriers themselves, are vigorously protected by their deeper foundational barriers (i.e. industrial paradigm, ideology of progress, short-term business interests); we need to overcome these foundational barriers first, in order to get rid of the related misconceptions as minor barriers.

Table-1 is in a sense the summary of my ongoing PhD: “Why does the theory and teaching of mainstream (neoclassical) economics ignore ecology?” I listed in this table most of the important misconceptions and barriers I have identified so far.

In Table-1, each neoclassical misconception like “technological optimism” is explained by a set of barriers and by a set of ecological principles. In this way, misconceptions are logically connected to barriers and (ignorance of) ecological principles. This logical connection claims, given neoclassical misconception is fostered and protected by given set of barriers and by ignorance of given ecological principles.

For example, “technological optimism” is explained by barriers like industrial paradigm, ideology of progress and underestimating limits, plus ecological illiteracy (1,2,6); i.e. ignorance of the three principles of ecology 1, 2 and 6, as listed in section 6 below.

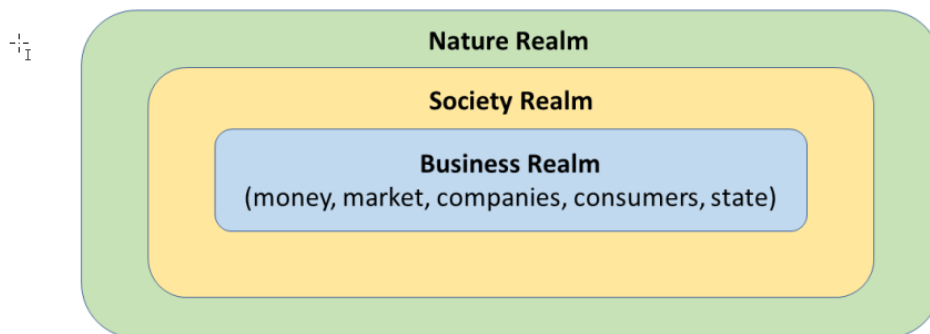
The listed *misconceptions* and *barriers* are introduced very briefly in Table-1. You may find detailed explanation of these misconceptions and barriers, and their relationships in part B of this thesis (Fundamentals: Background Information).

This thesis does not claim to have final explanations to neoclassical misconceptions and their possible causes. Neither does it claim to have the correct and complete list of barriers to ecological literacy, sustainability and pluralist education. This thesis is merely an attempt to summarize my claims about neoclassical misconceptions and their possible causes in a logically structured way for further discussions and clarifications.

## D.2. Barriers (to pluralism, ecology and sustainability)

Most important barriers of neoclassical economics to pluralism, ecological literacy and sustainability can be summarized as follows:

1. **Industrial paradigm:** Human-centred, mechanistic and reductionist worldview since industrial revolution (i.e. from organic world to machine world paradigm)
2. Western ideology of continuous, linear and limitless **progress**
3. Short-term and money-oriented **business interests:** Corporations like easy profits without inconvenient regulations, and corporations have the power to manipulate public opinion through media and education.
4. Limiting the scope of economy to **business realm** excluding society and nature (narrow and short-term view to economy)



5. **Invisible social costs:** Desire of business interests to make social and ecological costs of their destructive ventures (negative externalities) invisible to people
6. **Underestimating limits** (physical, social and ecological) of the world; in most cases due to factors like ecological illiteracy, ideology of linear progress and reckless greed
7. **Lack of historicity;** myopic view into the past and future, reducing scope of market analysis to exchange only, ignoring big and radical changes due to social and environmental factors (including politics and power relations) in the evolution of societies
8. Desire to see neoclassical economics as a universal **objective and benevolent science** in the service of whole humanity with universal receipts for development and well-being; i.e. not in the service of a privileged minority; Newton and physics envy in science
9. The **dominance of neoclassical economics** in academy, business and government

10. The dominance of neoclassical paradigm in prestigious **economics journals** that have significant influence on academic careers of economists
11. **Career path dependence**: Ecological literacy has no priority for the current structure of competitive education, academy and job market.
12. The structure of **university rankings** and **research funding** that favour mainstream (neoclassical) economics

### D.3. Criticism of economics education by student and academician associations

How do the barriers listed the sections above compare with the criticism of economics education by some student and academician associations?

This criticism can briefly be summarized as follows:

1. Undergraduate education of economics is dominated by the **neoclassical paradigm** in almost every country of the world
2. **Lack of pluralism** and intellectual diversity; neoclassical theory (principles, micro, macro) is taught as if it were the only valid and scientific theory, without mentioning other schools of thoughts like institutional, behavioural and ecological economics
3. Economics should become **reality based**; i.e. not based on unrealistic abstract models and misuse of mathematics based on flawed assumptions
4. Economics should be **problem led**, not method led; i.e. not trying to fit the reality to models, not providing only a partial and fragmented view of the object of inquiry
5. Current economics teaching is based on a **mechanical view** of the world. Quantitative analysis is overvalued at the cost of undervaluing qualitative analysis and qualitative lectures.
6. **Three-fold pluralism** is required for analysing real economic issues like unemployment: (1) interdisciplinary and methodological pluralism (2) reflexive pluralism (i.e. methods, assumptions, epistemology, history), and (3) theoretical pluralism (i.e. multiple schools of economics)
7. Almost nothing has changed since first student movement in Paris in 2000

References: Open Letter ([www.isipe.net](http://www.isipe.net), international), The Econocracy (Earle, Moran, Zach-Ward 2017), Post-Crash Economics Society (UK), PEPS-Economie (France), Rethinking Economics (UK), Netzwerk Plurale Ökonomik (Germany), Real-World Economics ([www.paecon.net](http://www.paecon.net))

Most misconceptions and barriers mentioned in this thesis are covered by the criticism of student and academician associations.

For example, industrial paradigm can be explained by “mechanistic view of the world” (5), business realm (i.e. narrow view) by “lack of pluralism” (2), inverse fitting by “reality based” (3) and “problem based” (4).

However, an explicit reference to ecology or anthropology is surprisingly missing in most reports published by critical student and academician associations that recommend three-fold pluralism, including interdisciplinary pluralism, for a broad-view education of economics.

In a report published by PEPS-Économie (2015) that influenced many other reports, three-fold pluralism is explained as follows:

1. Interdisciplinary pluralism: In addition to economics, we can also learn from Sociology, Philosophy, Political Science, Geography, History, Psychology etc.
2. Methodological pluralism: ...
3. Theoretical pluralism: ...

Why doesn't ecology have sufficient priority for these associations to be mentioned among interdisciplinary disciplines? There could be several reasons, like:



- Background and interests of a typical student of economics
- Designation of economics as “social science”; a barrier that excludes natural sciences
- Influence of urban lifestyle and industrial education that foster mechanistic worldview

In my opinion, the omission of ecology is a significant mistake in these reports that must be corrected.

#### D.4. Misconceptions of neoclassical economics and their possible causes

Table-1 explains each neoclassical misconception by (a) a set of barriers, (b) ecological ignorance types, and (c) other misconceptions. This logical connection claims, a misconception m1 is fostered and protected by barriers (b1, b2) and by ecological ignorance types (p1, p2), where p1 represents the 1<sup>st</sup> principle of ecology (see “Principles of ecology” in part A).

**Table-1** Neoclassical misconceptions and their possible causes

<i>neoclassical misconceptions</i>	<i>possible causes</i>
<b>monetary reductionism:</b> measuring use value and wealth with money, ignoring or underestimating non-monetary production of nature and society	industrial paradigm, business realm, ecological illiteracy (4, 5, 9), objective science, premature mathematisation, (consumerism)
<b>growth obsession:</b> limitless economic (GDP) growth as the ultimate goal of all economic policies, defining economic development with growth	(monetary reductionism), industrial paradigm, ideology of progress, underestimating limits, business realm, ecological illiteracy (4, 5, 9), business interests, (consumerism)
<b>technological optimism:</b> belief that every social and ecological problem can be solved with human technology	industrial paradigm, ideology of progress, ecological illiteracy (7,8), (monetary reductionism), underestimating limits, business interests, lack of historicity
<b>ignoring imperialism:</b> ignoring global imperialism, parasitic earnings and exploitation in the analysis of efficiency, technology, production, earnings and growth	objective and benevolent science, underestimating limits, ideology of progress, business interests, ecological illiteracy (4,10)
<b>ignoring power:</b> ignoring power relations in politics and economy	objective and benevolent science, business interests, lack of historicity, ideology of progress
<b>premature mathematisation:</b> overuse of quantification and mathematics in abstract theories that are disconnected from real life. Ignoring or underestimating the importance of qualitative analysis	objective science and physics envy, industrial paradigm, ecological illiteracy (5, 9, 11), (inverse fitting)
<b>ignoring externalities:</b> ignoring or underestimating the long-term and wide-reaching consequences of negative externalities like pollution, environmental destruction and climate breakdown	industrial paradigm, business realm, ecological illiteracy (10, 11), business interests, underestimating limits
<b>free market fundamentalism:</b> faith in free competitive markets that are supposed to solve every kind of social and ecological problems with very little state regulation; ignoring most preconditions for real free markets	industrial paradigm, business realm, ecological illiteracy (4, 9), business interests, (consumerism), lack of historicity
<b>social science:</b> excluding natural sciences like physics, ecology and anthropology from the scope of economics by defining economics as a social science	industrial paradigm, business realm, ecological illiteracy (4, 9), lack of historicity
<b>consumerism:</b> belief that human well-being can be improved by proper combinations and amounts of market goods and services; ignores non-monetary and qualitative (social & ecological) factors of happiness	industrial paradigm, business realm, ecological illiteracy (9, 12), business interests, objective science
<b>pricing everything:</b> attaching monetary values to all social and environmental assets, based on crude	industrial paradigm, ecological illiteracy (8, 9, 11), underestimating limits, objective science, premature mathematisation, (monetary reductionism)

mathematical models that ignore complexity and inter-connectedness of social and ecological systems	
<b>individualism</b> : misguided assumption that values, preferences and well-being of an individual don't depend on society; underestimating role of cooperation, overestimating role of competition for wealth and well-being	industrial paradigm, business interests, ecological illiteracy (5, 9, 12), (consumerism)
<b>pseudo efficiency</b> : measuring efficiency from the perspective of investor, not from the perspective of society (e.g. yield/amount per worker, not yield/nutrition per acre in agriculture)	industrial paradigm, business realm, (monetary reductionism), ecological illiteracy (4,8), business interests
<b>confusing means with ends</b> : e.g. growth or technology as ends rather than means	industrial paradigm, business realm, ideology of progress, ecological illiteracy (4,6,8,9,10), business interests
<b>curing symptoms</b> instead of diseases; e.g. use of chemical fertilizers and pesticides (as advanced technology) in industrial agriculture	industrial paradigm, ecological illiteracy (4,7,8,10), business interests, business realm
<b>inverse fitting</b> : fitting nature (including human nature) into abstract models based on unrealistic assumptions	industrial paradigm, objective science and physics envy, ecological illiteracy (7,8,9,12)
<b>nature as raw material resource</b> : modelling nature as a non-living, passive raw material resource and dumping ground for waste; not an active primary reproducer (air, water, soil, fish, stable climate...)	industrial paradigm, ecological illiteracy, business interests
<b>money justifies everything</b> : assuming that if a person or company earns money in legal ways, it must be producing something useful for the society and creating new jobs	industrial paradigm, business interests, (ignoring power), (ignoring imperialism), (monetary reductionism)
<b>follow the footsteps</b> of developed countries like Germany (education, institutions, industrialisation, urbanisation etc.) to become a “developed” country like Germany	industrial paradigm, Western ideology of progress, (technological optimism), (ignoring power), (ignoring imperialism), (ignoring externalities), ecological illiteracy (4, 5, 6, 9)
<b>healthy environment as luxury good</b> : We must first grow and develop our economy; we can think about the environment later (myth). Reducing healthcare to industrial services like medicine, hospital, technology	ecological illiteracy (1, 9, 10), industrial paradigm, (technological optimism), (ignoring externalities), business interests
Talking about <b>living standards</b> as if there can be living standards, and every society in the world should aim the same Western urban lifestyle; otherwise, it is backward (undeveloped)	Western ideology of progress, industrial paradigm, (consumerism), (technological optimism), ecological illiteracy (5, 6, 9)
<b>false history of progress</b> : Assuming that humanity has continuously progressed with agricultural revolution, industrial revolution, digital revolution...	Western ideology of progress, ecological illiteracy (5), (technological optimism), (ignoring imperialism)

### D.5. Which society is more “developed”?

A society that develops high-tech cancer drugs, or a society that doesn't need cancer drugs at all as a result of successful "preventive public health" policies such as healthy environment, healthy diet, and healthy lifestyle?

Note: Producing and selling lots of cancer drugs would increase GDP (Gross Domestic Product).

A society that develops high-tech chemical pesticides and fertilizers for monocultures, or a society that does not need agrochemicals at all because it practices multicultural (self-sufficient, sustainable and healthy) ecological agriculture?

Note: Producing and selling lots of agrochemicals would increase GDP.

A society that builds high-tech water treatment plants to filter pollution in its rivers, or a society which does not need treatment plants at all because it produces much less industrial pollution, and it protects the natural vegetation along the rivers? (Plants are the best water purifiers)

Note: Building water treatment plants would increase GDP.

A society that buries its beaches in 5-star concrete piles (hotel chains) in the name of “economic and touristic development” so that a privileged minority can earn lots of money, or a society that protects the natural beauty of its beaches and opens them to the public so that the majority can add wealth and beauty to their lives without paying any money?

Note: Hotel chains would certainly increase GDP.

A society that carries millions of tons of cargo and millions of passengers a day, establishing an extremely fast and dense transportation network, or a society that doesn’t need such a dense and fast transport network because it implements a smart settlement and production plan? (e.g. local self-sufficiency policy with emphasis on local production and local consumption)

Note: A dense and fast transport network would certainly increase GDP.

A society with a huge mechanical/electronic toy and entertainment industry, or a society that has less need for such leisure technologies and facilities because of its social, cultural and ecological wealth?

Note: Leisure and entertainment technologies would certainly increase GDP.

Whatever industry you take into consideration like agriculture and nutrition, education, health, sports and recreation, transport... As self-sufficiency and sustainability increases at the local level, the earning opportunities of corporations will diminish, along with the money-measure GDP.

Note: GDP tends to increase with decreasing local self-sufficiency, and vice versa.

Thus, policies aiming at self-sufficiency at local level, and business-oriented policies that aim at maximizing monetary incomes often push the economy to opposite directions. In order to earn money, most corporations, and especially big multinational corporations, need crippled and deficient socio-ecological ecosystems (→ Ecosystem Mutilation and Patching Business).

Industrial agriculture based on unsustainable and unhealthy monocultures is a typical example. In order to create a market for their GM seeds, chemical fertilizers and pesticides, multinational agrochemical corporations push agricultural policies from organic/traditional farming to industrial farming in many countries of the world, often in the name of “development, modernisation, higher efficiency, technological improvement”.

Anthropological economist Jason Hickel wrote in twitter: “2021 is a good year to ditch GDP as a measure of economic success. Governments should focus instead on things we actually need: public health, good livelihoods, climate stability, ecological regeneration, and a fairer distribution of income.” (→ [Hickel’s tweet on 5. January 2020](#))

My response to Hickel’s tweet: “I don’t believe, humanity can solve these fundamental social and ecological problems without stopping the global armament race. First, we must find a way to stop the destructive race for military armaments, then the destructive race for exploitative industrialization. I agree that we must get rid of this deceptive GDP measure because it rewards these destructive arms races. ... GDP tends to increase with decreasing local self-sufficiency, and vice versa.” (→ [my tweet on 5. January 2020](#))

We need to use more balanced measures like some well-conceptualised **happiness indices** that take qualitative factors of wellbeing into account. Developing such broad-view and balanced measures require ethical discussions like “what are the higher goals of economy?”

“Economic development” is an ambiguous and deceptive term whose imagery is often coloured by Western ideology of progress, GDP levels, imperial and wasteful lifestyle, buildings roads and cars, consumption culture, technology and industry fetichism (i.e. confusing means with ends). It is a term which must be either dropped or radically redefined, together with the habit of categorising countries as “developed” or “developing” (i.e. polite way of saying primitive or backward).

#### **D.6. Conclusions and suggestions for a better economics education**

The information summarized in Table-1 claims, the theory of neoclassical economics clashes against ecological literacy in many serious issues of life. There are in fact so many clash points that it is maybe not an exaggeration to claim that ecological illiteracy (fostered by urban lifestyle, industrial education, mainstream media and politics) is one of the foundational barriers of neoclassical economics, just like industrial paradigm, short-term business interests and ideology of progress. Because ecological literacy is absolutely necessary for sustainability, neoclassical economics also clashes against sustainability.

Take **growth obsession** (growthism) as an example. Anyone with some ecological literacy would be aware of the planetary limits to growth. Anyone with some basic knowledge of economics and ecology would know that GDP, as a monetary production measure, has many weaknesses like ignoring the non-monetary production (and recycling) of nature and society (Kütükçüoğlu 2019 & 2020).

Take **technological optimism** as another example. Anyone with sufficient ecological literacy would be informed about catastrophic failures of technology in history, like the case of DDT-based pesticides (Carson 1962). DDT-based insecticides were promoted as “symbol of technological progress” and “symbol of triumph in civilisation’s war against nature”, before its catastrophic consequences were discovered, like the mass-scale death of fish, birds and bees, and increasing cases of cancer in people. Ecological literacy tells us that allegedly advanced technologies can often have unexpected and far-reaching consequences, socially and ecologically (Goleman, Bennett, Barlow 2012).

A prediction based on the hypothesis implied by Table-1 (i.e. neoclassical economics clashes against ecological literacy) could be formulated as follows:

Economics departments, where neoclassical economics is the single dominant paradigm, will do everything in their power to exclude ecology and anthropology from their education program. If pressed too much by critical associations, they will prefer to take the path of “light pluralism”, in which relatively harmless content –again excluding deep ecology– will be added to the program in the name of reform. For example, a rather boring and unpopular kind of lecture for “multiple schools of economic thought” could be tolerable, provided that really critical schools like institutional or ecological economics are either downplayed or excluded.

It may be interesting to see, how economics departments would react to the following suggestion:

1) “All economics students must have a **solid background** in mathematics, physics, linear and nonlinear dynamic systems, ecology in the deep and broad sense including evolutionary (social and biological) anthropology, philosophy of science and economics, history of economic thought etc. before learning economics with its multiple schools. Only with such a broad and solid background, students can begin to learn economics in a critically active way. At least two years of university education must be dedicated to these fundamental disciplines.”

Putting everything together, including the important suggestions of “The Econocracy” (Earle, Moran, Ward-Perkins, 2017) about the economics profession, I can summarize my additional suggestions for a better economics education as follows:

2) **Three-fold pluralism** (interdisciplinary, methodological, theoretical) as the critical student and academicians like ISIPE, PCES and PEPS-Economie suggest. Among other fields like evolutionary (social and biological) anthropology, sociology, ecology and history of science, economics students should learn multiple schools of economic thought (e.g. institutional, behavioural, ecological, Marxian, Austrian, feminist) critically with lively discussions, already in undergraduate (bachelor) courses. The education and theory of economics should not be dominated by a single paradigm like neoclassical or neoliberal economics.

Neither should they be dominated by **business interests**. All economics students must be aware of the fact that there is a nonmonetary sustenance economy (i.e. nonmonetary reproduction of nature and society) as well as a monetary market economy. The economics department should not be seen as a twin department of business administration (or finance) by pushing nonmonetary sustenance economy to an invisible background, like pushing the chapter for “externalities” toward the rear end of economics textbooks.

3) Defining economics as a **holistic and evolutionary human science** instead of a “social science” to prevent the exclusion of natural sciences like evolutionary anthropology, ecology and physics. I think, modern physics (as well as classical Newton physics) is also important to understand complex, dynamic and nonlinear systems like living ecosystems, and to understand where it is proper or improper to use mathematics. Personally, I profited a lot from my broad knowledge of physics. For example, it was for me relatively easy to recognise the misuse of mathematics in economics.

4) Openly and explicitly discussing ethical issues and **higher goals** of economy like sustainable wellbeing for all (including future generations), economic justice and equity, sustainable livelihoods and ecological stability, rather than sticking to deceptive (and often pro-business) proxies like “GDP growth” and deceptive jargon like economic development, technological progress, modernisation and job creation.

5) Ecological, philosophical, anthropological, ethical and historical literacy; that is, **ecological literacy** in the broad sense for a broad-view (holistic and pluralist) qualitative analysis. Learning everything in its complete historical, social and ecological context... Training the ability to see the whole picture and its important individual parts at the same time...

Note that this kind of literacy requires both theory and real-life experience (i.e. learning by doing or experiencing), and it cannot be acquired in a university education alone. This kind of literacy (i.e. **holistic thinking** which is not crippled by disciplinary boundaries) may mean, we need to revolutionize the whole Western industrial education system which has evolved to produce tamed technicians and specialists (as ideal consumers for corporations) for narrowly defined careers in the corporate and government bureaucracy. For sustainable human life and sustainable economies, we need to make the transition from tamed technicians and specialist (who are not able to see the complete picture; so they are easily manipulated) to self-sufficient generalists who can build sustainable, just, equitable, democratic and happy communities (see criticism of the modern, narrow-minded and career-oriented industrial education in “The Unsettling of America” by Wendell Berry and in “The Revolt of the Elites” by Christopher Lasch. Similar criticism can be found in “The Econocracy” in the context of liberal education).

6) **Purpose of economics education** must be redefined: Not taking decisions for people, but helping people to understand their options so that they can take better democratic decisions for their future (see “The Econocracy”). Accordingly, the new kind of economics education must be understandable for everyone who wants to understand it (i.e. open science, open education). So, it must avoid maintenance and further development of an esoteric and confusing language that can be understood



by only a handful of academic elites. Most lay people don't understand what GDP (Gross Domestic Product) really measures, even though they believe, they do understand it.

These are in my opinion **five essential questions** that must be asked to economics departments of every university (Kütükçüoğlu, 2020; → [5 Essential Questions for all Departments of Economics](#)):

1. What lectures, seminars and other activities do you offer to undergraduate students in order to cultivate ecological literacy?
2. What have you done about the justified requests of 65+ student associations from 30+ countries (as explained in their Open Letter at [www.isipe.net](http://www.isipe.net) ) since 2014?
3. What kind of people choose to study economics, and what kind of license-level graduates does the department produce? What kind of mentality and worldview does the majority of these graduates possess?
4. Is the majority of (license-level) graduates open and broad minded enough to question mainstream concepts like economic growth, development and technological progress?
5. Does your Economics Department serve to long-term public interests like “sustainable well-being for all”, or primarily to the interests of business & finance? In other words, is it a public or business school?

## E. APPENDIX

### E.1. Mission statements, department information and lecture plans of the economics departments of some leading Swiss universities

#### University of Zürich - Faculty of Business, Economics and Informatics

<https://www.oec.uzh.ch/en.html>

Note: Business and informatics as twin departments of economics; nonmonetary economics of nature and society is excluded (anthropology, nonmonetary sustenance economy, ecology etc.)

Note: I studied economics at the University of Zürich.

In order to understand the level of *ecological literacy*, I analysed central introductory messages of the faculty like the mission statement, our values, structure of the bachelor (major) economics program (VWL Volkswirtschaftslehre in German), department brochure, and also the content of the lectures (including recommended textbooks) and other educational activities.

Note that *ecological literacy* is closely related with holistic, integrated, multi-disciplinary and long-term (into the past and future) view to social, historical and ecological realities of the world, including economy (oikos+nomia).

#### Welcome Page of the Faculty

Current welcome page: <https://www.oec.uzh.ch/en/aboutus.html>

Download welcome page as of July 2020 (I comment on this downloadable page)

[https://www.mediafire.com/file/6uj1vhh4x11amph/WelcomePage\\_Economics\\_UniZurich\\_July2020.pdf/file](https://www.mediafire.com/file/6uj1vhh4x11amph/WelcomePage_Economics_UniZurich_July2020.pdf/file)

“Our Faculty researches on new academic theories and methods in **business and economics, banking and finance, and informatics**. At the same time, we prepare our students for junior and senior positions in economics, academia, industry and politics.”

Reducing economics to business realm: Make no mistake! This is a faculty about business, economics, banking, finance and computer engineering. So, as a young student, one gets the impression that economics must be all about business, banking and finance. In other words, economics (oikos+nomia) must be all (and only) about money, just like chrematistics (i.e. the art of money-making at all costs).

Many people, who study economics either partially or completely, become quite influential in politics, bureaucracy and government. So, it is very important what kind of economic beliefs or worldviews they develop in such faculties, especially within the first one or two years of the study (Green, 2013; → “Teaching (un)sustainability?”)

“We offer you the opportunity to develop your full potential in a creative, **interdisciplinary environment**.”

Interdisciplinarity is underlined; this is really something positive. The question is, what kind of interdisciplinary lectures and activities are offered to foster the ecological literacy of students? For example, evolutionary (social & biological) anthropology? Environmental history of civilisations? Hands-on experience with permaculture gardens or natural aquariums? Forest excursions with a knowledgeable guide?

“Our goal is not only to play a leading role in Switzerland but also to be one of the best faculties in Europe.”

Quite ambitious. It must be questioned, best faculty in what sense? Hopefully not university and research rankings that foster the dominance of mainstream (neoclassical) paradigm (see “The Econocracy”, 2017).

### *Mission Statement of the Faculty*

Mission statements are important, because they give us important hints about the priorities of an organisation.

Current mission statement in English:

<https://www.oec.uzh.ch/de/aboutus/responsibility/missionstatement.html>

[Download](#) mission statement page as of July 2020 (I comment on this downloadable page)

[https://www.mediafire.com/file/br0ikr115401ap1/MissionStatement\\_Economics\\_UniZurich\\_July2020.pdf/file](https://www.mediafire.com/file/br0ikr115401ap1/MissionStatement_Economics_UniZurich_July2020.pdf/file)

Under *Responsibility in Business and Society*:

“We maintain strong links to regional businesses and corporate partners in public and private sectors. We train our students to reflect their role in a global economy in a responsible manner and take into account the economic, social and ecological consequences of their decisions.”

Considering not only economic (i.e. business and money related), but also social and ecologic consequences... Well, this is something positive; many other faculties of economics don't even mention social and ecological consequences in their mission statements. Note: One needs to have sufficient *ecological literacy* in order to be able to consider ecological consequences.

But, why only business and corporate partners? Is economics all about business and corporate partners? How will you consider social and ecological consequences of your decisions if you care only about business and corporate partners?

Is this a faculty that should serve to public interests (including next generations), or to business interests only? Or does the faculty believe (like the theory of neoclassical or neoliberal economics), public interest is almost identical to business interest with minor exceptions?

### *Structure and Content of Bachelor Study (major in economics)*

Volkswirtschaftslehre (Economics in German)

<https://www.oec.uzh.ch/de/studies/bachelor/oec/econ.html>

Economics

<https://www.oec.uzh.ch/en/studies/bachelor/oec/econ.html>

[Download](#) flyer (pdf): **Programs Offered to Students at Bachelor's Level in the Faculty of Business, Economics and Informatics (July 2020)**

[https://www.mediafire.com/file/wog6tspkeetoz40/Angebot\\_Bachelor\\_EN\\_UniZurich\\_July2020.pdf/file](https://www.mediafire.com/file/wog6tspkeetoz40/Angebot_Bachelor_EN_UniZurich_July2020.pdf/file)

This program overview, and all listed study programs in it, are about economics, banking & finance, software & computer and business administration. There is only one indirect and optional connection to biology and ecology: Informatics with Natural Sciences.

The question is, what is meant with natural sciences? For example, bio-technology as a popular branch, is not a real natural science; it is more like an (mechanistic & reductionist) industrial corporate science, often requested (and controlled) by industrial healthcare or agriculture.

In any case, natural sciences (and whatever is meant by it) is only an option taken by students who want to study software engineering as major or minor study.

[Download](#) flyer (pdf): **Bachelor Major/Minor Program (in German, July 2020)**

[https://www.mediafire.com/file/cus9lnrmw8f9mta/Flyer\\_Bachelor\\_Major-Mino\\_WirtschaftUniZH\\_Juli2020\\_r.pdf/file](https://www.mediafire.com/file/cus9lnrmw8f9mta/Flyer_Bachelor_Major-Mino_WirtschaftUniZH_Juli2020_r.pdf/file)

“Mit dem Bachelorstudium erhalten Sie eine **breite, fächerübergreifende** und methodisch fundierte Grundausbildung, die Ihnen sowohl den direkten Berufseinstieg als auch ein weiterführendes Studium auf Masterstufe ermöglicht.»

In English: “With the bachelor's degree, you receive a **broad, interdisciplinary** and methodologically sound basic training, which enables you to start your career straight away as well as a further degree at master's level.”

“Broad and interdisciplinary...” This is positive for ecological literacy.

«Volkswirtschaftslehre beschäftigt sich mit gesamtwirtschaftlichen Zusammenhängen und untersucht, wie **Firmen und jeder einzelne von uns** wirtschaftliche Entscheidungen treffen. Mögliche Themen sind: Wie beeinflussen Politik und Nationalbank das **Wirtschaftswachstum**, wie bekämpft man Arbeitslosigkeit, und was passiert, wenn die Inflation oder die Zinsen steigen?»

In English: “Economics deals with macroeconomic relationships and examines how **companies and each of us [i.e. individuals]** make economic decisions. Possible topics are: How do politics and the National Bank influence **economic growth**, how we can fight unemployment, and what happens if inflation or interest rates rise?”

Terms like sustainability, environment, society or ecology are not included in this subject description. It is also noteworthy that *economic growth* (GDP growth) is casually mentioned as the undisputed end-goal of all economic-political measures. This typically mainstream (orthodox, dominant, neoclassical) attitude, which is based on (a) mechanistic reductionism and (b) monetary reductionism, is in most cases incompatible with ecological sustainability.

We are told that individuals and companies make economic decisions. The role of society is simply ignored here. The social (or aggregate) decision is not simply the sum of (presumably socially independent) individual decisions. A typical example of flawed mathematics: Obtaining the aggregate (social) demand by simply summing up the individual demands, assuming that individual demands are independent of the society (i.e. other individuals).

[Download](#) flyer (pdf): **Bachelor Lecture Program Economics (Major/Minor)**

[https://www.mediafire.com/file/fxsj9c0abw85zty/BachelorLecturesEconomics\\_UniZurich\\_July2020.pdf/file](https://www.mediafire.com/file/fxsj9c0abw85zty/BachelorLecturesEconomics_UniZurich_July2020.pdf/file)

There are lots of lectures like microeconomics, macroeconomics, business administration, accounting, econometrics, banking & finance, information systems, and so on.

The only possible connections with *ecological literacy* are:

- 1) Environmental Economics under Microeconomics (econ 1) as core elective.
- 2) Under Minors: Depending on the programs on offer, students may select a minor study program offered by another faculty.

The questions are:

- 1) What is the content of the section Environmental Economics under Microeconomics (econ 1)? Does it really foster ecological literacy, or does it handle nature like a mechanistic and limitless resource with quantitative analysis only? What percentage of students take this lecture?
- 2) Which selective minor programs or lectures are offered that foster ecological literacy, like biology/ecology/evolution, evolutionary anthropology, history of economic thought including anthropological or ecological schools?

*Department of Economics in University of Zurich*

Current **About Us** page:

<https://www.econ.uzh.ch/en/departement.html>

Download **About Us** page as of July 2020 (I comment on this downloadable page)

[https://www.mediafire.com/file/118q4fjuy00txt2/AboutUs\\_DepartmentOfEconomics\\_UniZurich\\_July\\_2020.pdf/file](https://www.mediafire.com/file/118q4fjuy00txt2/AboutUs_DepartmentOfEconomics_UniZurich_July_2020.pdf/file)

“Over the last decade, the Department of Economics has developed into a leading research department, consistently **ranked among the top five** European economics departments. Our two PhD programs attract applications from excellent students from all over the world.”

Top five! An ambitious department. The question is, what priorities should be assumed, and what needs to be done, to get such a high ranking among economics departments of Europe? What are the prime measures, priorities and values of this competition? What is the place of ecological literacy in this mainstream oriented competition?

Current **Our Values** page:

<https://www.econ.uzh.ch/en/departement/values.html>

Download **Our Values** page (I comment on this downloadable page)

[https://www.mediafire.com/file/4yghcauxr8vh3ri/OurValues\\_EconomicsDepartment\\_UniZurich\\_July\\_2020.pdf/file](https://www.mediafire.com/file/4yghcauxr8vh3ri/OurValues_EconomicsDepartment_UniZurich_July_2020.pdf/file)



# Pioneering Economics

## Leading the Way. Providing Perspectives.

The Department of Economics is a thought leader in economics and addresses the challenges and questions of today's society. With our forward-thinking attitude and multidisciplinary approach, we are pushing into uncharted territory. We offer direction – to students, society, leaders and policy makers.

## Inspiring Curiosity. Enabling Transformation.

The Department of Economics is transforming the global discourse of economics through its research. We believe that personal, social and scientific transformation begins with inspiration and insight. We reach out to provide a home to open-minded scientists and colleagues.

## Promoting Talents. Leveraging Diversity.

The Department of Economics seeks variety and diversity in cultural and scientific backgrounds, approaches, lifestyles and interests. We offer our students world-class education and outstanding facilities. We encourage novel approaches and collaboration across borders to create an inspiring work environment for all employees.

## Creating Economics. Shaping Society.

The Department of Economics pushes towards a fundamentally new understanding of economics. We challenge and redefine conventions and thought categories based on methodological analysis and empirical evidence. We share our insights in accessible ways and aim to create a significant impact on society and contribute positively to the world as a whole.

“With our forward-looking attitude and multidisciplinary approach...”

Both backward (historical evolutionary analysis) and forward-looking attitudes are required; historical analysis should not be missing.

Multidisciplinary approach is positive, especially if ecology is among these disciplines.

“We reach out to provide a home to open-minded scientists and colleagues.”

What is meant by open-minded? Does it include heterodox and unorthodox thinkers like Thorstein Veblen, K. William Kapp or Karl Polanyi?

What kind of scientists? For example, broad-minded biologists, environmentalists, philosophers and evolutionary anthropologists are included, or rather excluded, because they might cause ideological collisions with the business/finance/military oligarchy and industrial sciences?

“We challenge and redefine conventions and thought categories based on methodological analysis and empirical evidence.”

Does the faculty challenge mainstream (neoclassical, orthodox) assumptions like GDP growth and economic development in the neoclassical sense? Does it challenge the Western ideology of progress?

“Empirical evidence”: Does it imply quantitative analysis only, or do you see qualitative analysis (like ultimate goals of economic policies, ethics, ideologies, complex social & ecological relationships, biological and cultural evolution) at least as important as quantitative analysis?

*Department Brochure (Economics)*

Current Department Brochure (pdf):

[https://www.econ.uzh.ch/dam/jcr:717ef163-da87-49e8-9080-646fe5f61baa/Broschure%202016\\_final\\_EN\\_nov.pdf](https://www.econ.uzh.ch/dam/jcr:717ef163-da87-49e8-9080-646fe5f61baa/Broschure%202016_final_EN_nov.pdf)

[Download Economics Department Brochure](https://www.mediafire.com/file/uepetazd0lyy9qp/Broschure+2016_final_EN_nov_EconomicsDepartment_UniZurich_July2020.pdf/file), July 2020 (I comment on this downloadable brochure)  
[https://www.mediafire.com/file/uepetazd0lyy9qp/Broschure+2016\\_final\\_EN\\_nov\\_EconomicsDepartment\\_UniZurich\\_July2020.pdf/file](https://www.mediafire.com/file/uepetazd0lyy9qp/Broschure+2016_final_EN_nov_EconomicsDepartment_UniZurich_July2020.pdf/file)

The Department promotes the dialog between science and society regularly with a series of public events, inviting scholars, innovators and visionaries to our auditorium.

Dialog between science and society; this is something positive. The questions are, what kind of science, and what kind of innovators and visionaries?

For example, would subjects like ecological farming (as antithesis to industrial farming) be included? Or, organic/holistic health (healthy social and biological environment, lifestyle, food etc.) instead of industrial healthcare?

“... and our two associated centers, the Excellence Foundation Zurich and the UBS International Center of Economics in Society. Both centers are central pillars to our success.”

UBS is a big multinational bank with vested interests in much disputed projects like socially and environmentally destructive oil pipelines in Canada. I would like to know more about these foundations. I hope, they are not closely related with vested business/finance interests (against long-term public interests) and neoliberal think-tanks, that might heavily influence the education and research scope of the faculty.

The name “Excellence Foundation Zurich” reminds me “Research Excellence Framework” (REF) in UK, which is considered by the authors of “The Econocracy” (2017) as one of the biggest barriers to pluralist economics education. Besides, many neoliberal think-tanks like to use the word “excellence” in their names.

Can we easily open other centres in the faculty? For example, a centre for ecological literacy, another centre for evolutionary (social & biological) anthropology, another centre for ecological farming and lifestyle, yet another centre for heterodox economic schools like ecological and institutional economics? What is needed to open such centres within the department building?

“The history of the Department’s evolution goes back to the year 1908, when the Socioeconomic Seminar was founded. By 1970, four departments were conducting economic research at the University of Zurich, a fifth economic institute was later established. Due to the increasing interaction and cooperation between them and to further strengthen the interdisciplinary approach, the institutes merged in 2011, to form the Department of Economics.”

What were these four departments before the merge? If socioeconomic seminar was the start, why is sociology not a part of the economics bachelor program?

“... Graduate Studies Program in Economics in 2009, followed by the introduction of the Doctoral Program in Neuroeconomics in 2010.”

What is the strategic sense of neuroeconomics? Is it related with business sectors like digital industrial healthcare, digital industrial agriculture; digital control, surveillance capitalism, mind manipulation and marketing over social media?

“The University of Zurich was founded in 1833 and is Switzerland’s largest university.”

“The university provides academic services, collaborates with the private sector, and considers itself part of a national and global network for the acquisition and dissemination of knowledge.”

I hope, this collaboration with private sector is not too intense, otherwise it might shift the interests and priorities of the university to vested business interests, rather than pursuing long-term public interests.

Or should we accept that Switzerland is a neoliberal business country, with completely aligned interests of the majority of the public? In other words, is it a democratic decision that Switzerland should be a neoliberal business country, with a compatible business-oriented education system?

“The program teaches students methods for examining economic problems at the **micro and macro levels.**”

This statement gives the impression that microeconomics and macroeconomics are the real core lectures of the department. This makes the content and potential (neoclassical/neoliberal) indoctrination by these lectures –always depending on their content and emphasis—all the more important.

“Students acquire the **analytical tools** necessary to do this and learn to apply empirical methods to economic questions.”

So much emphasis on analytical tools... How about holistic, inter-disciplinary and pluralist thinking and qualitative analysis?

“In the first year, students attend compulsory courses in econometrics, **macroeconomics, and microeconomics** ...”

Note: Students learn microeconomics and macroeconomics before learning important background fields like ecology, sociology or anthropology that often help to ask critical questions to mainstream (neoclassical) theory.

Depending on the content and emphasis of the lectures of microeconomics and macroeconomics, this might have important implications for neoclassical/neoliberal indoctrination (e.g. mechanistic & reductionist industrial paradigm, money reductionism, market fundamentalism, technological fundamentalism, blind belief in progress and limitless growth etc.).

“Graduates of the program are prepared for **leadership positions** in economic research in universities, government policy organizations and business.”

There are many mainstream economists who become quite influential in politics, state and business. That is, economics is a strategically important education.

“Students learn to understand **complex relations in the markets** and to apply this knowledge in business, politics or research.”

Why complex relations in the markets only? Is economics all about markets? Why not also complex social and ecological relations, especially if the ultimate goal of economic policies is sustainable well-being for all, including future generations (instead of GDP growth)?

“The Doctoral Program in **Neuroeconomics** at the University of Zurich was launched in 2010. Its faculty consists of internationally renowned scholars with expertise in behavioural economics, neuroimaging, **neuropharmacology, brain stimulation techniques**, and computational modelling.”

Seems to be related with strategic issues like digital industrial healthcare/farming, digital marketing & manipulation over social media, global digital control of peoples, lands and other creatures, surveillance capitalism... Is every medium just for earning money? How about ecological sustainability, the future of the world and people? This is the (inevitable!) trend, and “we must earn our share from it”?

“The **Zurich GSE** (Zurich Graduate School of Economics) at the University of Zurich offers one of the leading European PhD programs in Economics,”

“... with emphasis given to the areas of **Macroeconomics, Experimental and Behavioural Economics, Applied Microeconomics, Microeconomic Theory, and Econometrics.**”

As usual, subjects like ecology or evolutionary anthropology are not included in the priority list.

Macroeconomics: “The great diversity of experiences among **developing and emerging countries** have also taught us that institutions and socio-political factors are essential for understanding the wealth and poverty of nations.”

Developing and emerging according to what criteria? Or do you consider neoclassical criteria like *GDP growth* as the undisputed scientific criterion (or proxy) for the ultimate goal of all economic policies?

How can a country like India, with thousands of years of deep cultural history, suddenly emerge? Was everybody in India living in miserable conditions before the neoclassical GDP growth? (i.e. potential collision with historical facts → don't teach evolutionary anthropology to students?)

Macroeconomics: “It **focuses on issues related to**

- Growth and Development
- Emerging Markets
- Trade and Globalization
- Innovation
- Economic History
- International and Public Finance
- Labour and Financial Markets”

Issues like environment, physical and ecological limits of the world, ecology, ecosystems are not included. As if, such issues were not required to understand the big picture in economics.

Faculty Research: “But while China is much richer today than it was thirty years ago, its **level of economic development** is still low, with a per capita income of about 20 percent of the Swiss **per capita GDP.**”

Again, another emerging(!) country which can emerge thanks to its growing GDP. As if, GDP were the flawless, complete, undisputable, scientific measure of economic development. What happened to the critical, questioning, inter-disciplinary spirit of the faculty?

Microeconomics/interdisciplinary approach: “One area of research concerns the use of game theory and mechanism design to study complex institutions; e.g. health insurance, network industries, research and development, **markets for pollution permits**, credit markets, and treasury auctions. **Insights from biology, psychology, and sociology** are incorporated to understand how behavioural factors such as social norms and preferences, peer effects and culture influence the design of optimal policies.”

Insights from biology, psychology and sociology... seems positive, but: Does this paragraph tell us that with these interdisciplinary insights, we should find optimal policy solutions within the market context only?

If this is the intended meaning, it seems like “market and technology fundamentalism” to me, that claims: “We don't need social and ecological solutions to social and ecological problems. We just need to develop new technologies and new market incentives to solve every kind of social and ecological problem.” Such a mindset requires absolute ecological illiteracy.

Microeconomics/interdisciplinary approach: “Another area covers the **social and biological determinants of human preferences and their evolutionary origins**: how do institutions shape preferences, and do biases in risk or time preferences have an evolutionary explanation? These questions are approached using a variety of theoretical, computational, and empirical tools, including laboratory and field experiments, neuroimaging, genetic analysis, non-invasive brain stimulation, and pharmacological interventions.”

Again, this sounds like digital marketing, manipulation and control, combined with surveillance capitalism to me. A related fallacy could be, mechanistic and reductionist models of complex organisms and behaviours.

*Content of economics (intro, micro, macro) lectures in bachelor major and recommended textbooks for each lecture*

Courses: <https://studentservices.uzh.ch/uzh/anonym/vvz/index.html>

Major 150 / Economics

### Assessment level: Bachelor OEC – Microeconomics I

Learning Outcome: Die ökonomische Denkweise kennen lernen und auf gesellschaftliche und wirtschaftliche Fragen anwenden. In English: Learn the economic way of thinking and apply it to social and economic issues.

Course Materials: Pflichtlektüre: Robert H. Frank, Microeconomics and Behavior (obligatory reading), McGraw- Hill.

Module Coordinator: Ulf Zölitz (email: [ulf.zoelitz@uzh.ch](mailto:ulf.zoelitz@uzh.ch))

### Advanced Level (Bachelor) - Core elective area: Macroeconomics (ECON1/VWL1)

Not Grouped		[≡]
Aktuelle Probleme der Schweizer Wirtschaftspolitik (V) (Current Issues in Swiss Economic Policy)	3 ECTS	
BOEC0340 Course		
Development Economics (L+E)	6 ECTS	
BOEC0343 Course		
Economic Growth (L + E)	6 ECTS	
BOEC0304 Lecture with Practical Exercises		
Methods of Empirical Macroeconomics (L+E)	6 ECTS	
BOEC0301 Lecture with Practical Exercises		
Wissenschaftstheorie für Wirtschaftswissenschaftler/innen (S) (Philosophy of Economics)	3 ECTS	
BOEC0358 Seminar		

### Development Economics



This course provides a survey of the basic methods and insights of development economics. It links theoretical, empirical and historical aspects and also sheds light on the results of current research.

Module Coordinator: Hans-Joachim Voth

### **Economic Growth (L + E)**

The course covers theoretical and empirical aspects of Economic Growth at an introductory/intermediate level. We also emphasize macroeconomic aspects of development issues. We start from the description of the empirical distribution across countries of GDP per capita levels and growth. We then consider the accumulation of physical and human capital. We discuss technical progress, innovation and technological convergence. Finally, we address the role of institutions, the effect of technological change on income inequality and sustainability challenges.

Learning Outcome: Intermediate knowledge of Economic Growth

3 recommended textbooks (but lectures will be self-contained): Introduction to Economic Growth by Jones and Vollrath, Economic Growth by David Weil, The Economics of Growth by Philippe Aghion and Peter Howitt. These textbooks are recommendations only, all necessary materials will be provided.

David Hémous: ssociate Professor of Economics of Innovation and Entrepreneurship, funded by the UBS International Center of Economics in Society (i.e. direct business influence)

### **Methods of Empirical Macroeconomics (L+E)**

The course equips students with the tool kit required for empirical analysis in macroeconomics/finance and forecasting as it is conducted by academic researchers or government agencies, such as monetary authorities or international organizations. In the first part, we focus on key time series techniques. Later in the course, we also look into the problems of handling "Big Data" and discuss elements of "Machine Learning". The course has a two-pillar concept: while the focus is on economics, we show how empirical and theoretical concepts are related as we go along. In the tutorials, we will also work on actual programming exercises, thus developing our own toolkit for many of the techniques in the course in a matrix-oriented programming language.

Mathias Hoffmann: Full Professor of International Trade and Finance

### **Wissenschaftstheorie für Wirtschaftswissenschaftler/innen (S) (Philosophy of Economics)**

Als Studierende der Wirtschaftswissenschaften lernen Sie, einen bestimmten Phänomenbereich der Welt zu analysieren und werden so zu "Beobachtern erster Ordnung" ausgebildet. Wenn Sie sich zusätzlich fragen, wie Ihre Wissenschaft funktioniert, welche historische Wurzeln sie hat, wo Potential und Grenzen der Methoden wie auch der begrifflichen Konzepte und Fragestellungen liegen und was Alternativen sein könnten, dann interessieren Sie die Voraussetzungen Ihrer Wissenschaft und Sie werden zu "Beobachtern zweiter Ordnung".

Suchen Sie Antworten auf diese Fragen und interessieren Sie die angeschnittenen Themen, dann senden Sie bitte ein Motivationsschreiben (das zeigt, was Sie mitbringen und was Sie erwarten) an [suzannviola.renninger@uzh.ch](mailto:suzannviola.renninger@uzh.ch). Regelmässige Teilnahme, eine konzentrierte Vorbereitung sowie eine aktive Beteiligung an den Diskussionen sind für den Erfolg dieser Veranstaltung unerlässlich.

In English:

As a student of economics, you will learn to analyse a certain area of phenomena in the world and will thus be trained to be "first-order observers". If you also ask yourself how your science works, what historical roots it has, where the potential and limits of the methods as well as the conceptual concepts

and questions lie and what alternatives could be, then you are interested in the prerequisites of your science and you will become "observers" second order".

If you are looking for answers to these questions and you are interested in the topics raised, please send a letter of motivation (which shows what you will bring with you and what you expect) to [suzannviola.renninger@uzh.ch](mailto:suzannviola.renninger@uzh.ch). Regular participation, focused preparation and active participation in the discussions are essential for the success of this event.

<https://www.econ.uzh.ch/en/people/adjunctfaculty/renninger.html>

### Advanced Level (Bachelor) - Core elective area: Macroeconomics (ECON1/VWL1)

Grouped: Required/Elective	
Core Elective Modules	
Introduction to Economic Inequality (L) BOEC0420 Course	3 ECTS
Introduction to Game Theory (L+E) BOEC0109 Lecture with Practical Exercises	6 ECTS
Seminar in Smart Contracts and Blockchain Technology HS20 BOEC0427 Seminar	3 ECTS
Umwelt- und Ressourcenökonomik (V) (Environmental and Resource Economics) BOEC0216 Course	3 ECTS
Vertrags- und Informationsökonomik (L+E) (Contract and Information Economics)	6 ECTS

### Introduction to Economic Inequality (L)

The course will provide an introduction to economic inequality. We will cover different aspects of inequality including trends in global income and wealth inequality; the determinants of social mobility; the importance of the home environment, early education and schooling in shaping life outcomes; gender and race inequality; inequality in health and exposure to severe weather conditions/climate change. We will also examine evidence on the distribution of social preferences and preferences for redistribution. The emphasis will be on empirical evidence and the econometric methods that have been used in the literature on economic inequality. The course is intended for third year students who are comfortable with formal economic models and who have a good understanding of empirical methods such as regression analysis.

Students will acquire knowledge on different aspects of inequality and will learn the econometric tools which have been used to study economic inequality. Students will know, contextualize and be

able to critically assess empirical evidence presented in recently published papers on the different topics.

Teodora Boneva: Assistant Professor of Economics of Child and Youth Development

### **Environmental and Resource Economics**

In der Vorlesung wird die Interaktion zwischen wirtschaftlicher Aktivität und natürlicher Umwelt analysiert. Insbesondere wird untersucht, in welchen Situationen umweltpolitisch motivierte staatliche Eingriffen ins Wirtschaftsgeschehen wünschenswert sind und welche Form sie gegebenenfalls annehmen sollten. Die Erkenntnisse der Veranstaltung werden auf aktuelle umweltpolitische Themen angewandt.

Die Theorie der Umweltökonomik verstehen. Diese Theorie auf aktuelle umweltpolitische Fragen anwenden.

In English:

In the lecture the interaction between economic activity and the natural environment is analysed. In particular, it is examined in which situations state intervention in economic activity motivated by environmental policy is desirable and which form they should take if necessary. The findings of the event are applied to current environmental issues.

Understand the theory of environmental economics. Apply this theory to current environmental issues.

Armin Schmutzler: Full Professor of Microeconomics, Industrial Organization, and Environmental Economics

### **University of Basel - Faculty of Business and Economics**

Current welcome page: <https://wwz.unibas.ch/en/home/>



## Study

Research-based teaching: The Faculty of Business and Economics aims to integrate the fields of Business and Economics, thereby offering students a unique curriculum in Switzerland. Based on the academic experience and in light of future career opportunities for our alumni, we are convinced that this is a winning combination.



## Research

Research is a fundamental part of every university. Without research there is no development and no innovation. Without excellent research performance, teaching will not remain exciting, and the dialog with business and industrial partners lacks input. The faculty maintains a high position in research, both on a national and international level, especially given its size and financial resources.

“The Faculty of Business and Economics aims to integrate the fields of business and economics, thereby offering students a unique curriculum in Switzerland.”

Note: Business and economics as inseparable twin departments.

### About the Faculty

Current “About Faculty” page: <https://www.unibas.ch/en/faculty/about-the-faculty/>

Founded in 1460, the University of Basel is the **oldest university in Switzerland**. The Faculty of Business and Economics was established in 1995 and is the second youngest of the overall seven faculties at the University of Basel. However, the subject of economics has already been taught for **almost 150 years** in Basel.

Our focal areas are “Money and Finance”, “Energy and **Environment**” (The Competence Center SCCER CREST) and “Economic Policy.”

Our academic staff publishes in **top-ranking journals** and participates in international seminars. High-caliber guest professors teach the special courses we offer on Globalization and the Internationalization of the Economy.

Top ranking journals? Probably, all of them are mainstream (neoclassical) journals.

The Faculty of Business and Economics **aims to integrate the fields of Business and Economics**, thereby offering students a unique curriculum in Switzerland.

Integrating business and economics? Doesn't seem like a very new and innovative idea. In fact, Veblen complained that economics had become a business ideology. This is still one of the main problems of economics.

*Bachelorstudium / Mittelfristige Lehrpläne (bachelor lecture plans)*

<https://wwz.unibas.ch/de/studium/dokumente/mittelfristige-lehrplaene/>

**Herbstsemester 2020: Mittelfristiger Lehrplan für das Bachelorstudium ab HS 20**

[https://wwz.unibas.ch/fileadmin/user\\_upload/wwz/01\\_Studiendekanat/02\\_Bachelorstudium/02\\_01\\_Lehrplaene/2020\\_HS\\_Bachelor\\_Lehrplan\\_Wirtschaftswissenschaften\\_Stand\\_03\\_08\\_20.pdf](https://wwz.unibas.ch/fileadmin/user_upload/wwz/01_Studiendekanat/02_Bachelorstudium/02_01_Lehrplaene/2020_HS_Bachelor_Lehrplan_Wirtschaftswissenschaften_Stand_03_08_20.pdf)

Modul Economics II - 10160 Environmental and Resource Economics  
Interfakultärer Wahlbereich – 56947 Kolloquium Plurale Ökonomik

**Frühjahrssemester 2020: Mittelfristiger Lehrplan für das Bachelorstudium ab FS 20**

[https://wwz.unibas.ch/fileadmin/user\\_upload/wwz/01\\_Studiendekanat/02\\_Bachelorstudium/02\\_01\\_Lehrplaene/2020\\_FS\\_Lehrplan\\_Bachelor\\_Wirtschaftswissenschaften\\_Stand\\_191219.pdf](https://wwz.unibas.ch/fileadmin/user_upload/wwz/01_Studiendekanat/02_Bachelorstudium/02_01_Lehrplaene/2020_FS_Lehrplan_Bachelor_Wirtschaftswissenschaften_Stand_191219.pdf)

Modul Economics II - 10160 Environmental and Resource Economics  
Interfakultärer Wahlbereich – 56947 Kolloquium Plurale Ökonomik

*Einzelne Vorlesungen (individual lectures)*

**10130-01 - Vorlesung: Einführung in die Volkswirtschaftslehre 6 KP**

<https://vorlesungsverzeichnis.unibas.ch/de/studienstruktur?id=252185>

Als Grundlage dient das Lehrbuch "Economics" von N. Gregory Mankiw und Mark P. Taylor, Cengage Learning, 2019 (5th Edition) in englischer Sprache.

**10134-01 - Vorlesung: Intermediate Microeconomics 6 KP**

<https://vorlesungsverzeichnis.unibas.ch/de/studienstruktur?id=252186>

Jeffrey M. Perloff, Microeconomics with Calculus, Verlag: Pearson. Eine gekürzte und verbilligte Version dieses Lehrbuchs ist im örtlichen Buchhandel erhältlich.

**10184-01 - Vorlesung: Intermediate Macroeconomics 6 KP**

<https://vorlesungsverzeichnis.unibas.ch/de/home?id=246535>

Blanchard, O., F. Giavazzi, A. Amighini (2017): Macroeconomics: A European Perspective, 3rd edition. (Haupttext).

**10161-01 - Vorlesung: Wachstum und Entwicklung 6 KP**

<https://vorlesungsverzeichnis.unibas.ch/de/studienstruktur?id=252192>

Die Literatur wird in der Vorlesung bekannt gegeben.

**10160-01 - Vorlesung: Environmental and Resource Economics 6 KP**

<https://vorlesungsverzeichnis.unibas.ch/de/home?id=246532>

R. Perman, Y. Ma, J. McGilvray, M. Common and D. Maddison (2011), "Natural Resource and Environmental Economics", 4th edition, Pearson Education.

**42751-01 - Seminar: Bachelorarbeit in Umwelt und Energie 12 KP**

<https://vorlesungsverzeichnis.unibas.ch/de/studienstruktur?id=251852>



**56947-01 - Kolloquium: Plurale Ökonomik 3 KP**<https://vorlesungsverzeichnis.unibas.ch/de/semester-planung?id=248204>**University of Bern – Department of Economics**[https://www.vwi.unibe.ch/index\\_eng.html](https://www.vwi.unibe.ch/index_eng.html)*Studies*[https://www.vwi.unibe.ch/studies/prospective\\_students/index\\_eng.html](https://www.vwi.unibe.ch/studies/prospective_students/index_eng.html)

## Prospective students

The Department of Economics is one of the leading Economics department in Switzerland. The outstanding basic research and practice-oriented applied research are incorporated in our Bachelor's and Master's degree programs. The Department of Economics offers a Bachelor's degree program and four different Master's degree programs in the field of Economics. The Master's degree programs comprise the regular Master's in Economics and the specialized degree programs in International and Monetary Economics (MIME), in Applied Economic Analysis (MAEA) und in Business and Economics.

You are interested in a

- [Bachelor's degree program](#)
- [Master's degree program](#)
- [PhD program](#)

*Bachelor Volkswirtschaftslehre (bachelor economics)*

Current page:

[https://www.wiso.unibe.ch/studium/studienprogramme/bachelor\\_volkswirtschaftslehre/index\\_ger.html](https://www.wiso.unibe.ch/studium/studienprogramme/bachelor_volkswirtschaftslehre/index_ger.html)

«Ökonomische Probleme gehen uns alle an. Finanzkrise, Globalisierung, **Gesundheit, Ökologie**, Arbeitslosigkeit, Altersvorsorge und Armutsbekämpfung sind nur einige Beispiele für volkswirtschaftlich relevante Themen, die täglich in den Medien sind. Mit einem Studium der Volkswirtschaftslehre setzen Sie sich mit solch aktuellen Problemen auseinander.»

In English: “Economic problems concern us all. The financial crisis, globalization, **health, ecology**, unemployment, old-age provision and poverty reduction are just a few examples of economically relevant topics that are in the media every day. With a degree in economics, you deal with such current problems.”

It is positive for ecological literacy that “ecology” is included among economic problems.

“Mit einem VWL-Studium erhalten Sie eine **breite und umfassende Ausbildung**, die Ihnen ermöglicht, komplexe Entscheidungsprobleme selbständig zu lösen. Entsprechend schult ein Studium der VWL das **analytische Denken**, entwickelt die Fähigkeit zur Abstraktion und beschäftigt beide Seiten des Gehirns (Abstraktion vs. Intuition).»

In English: “With a degree in economics, you receive **broad and comprehensive training** that enables you to solve complex decision-making problems independently. Accordingly, studying economics trains **analytical thinking**, develops the ability to abstract and occupies both sides of the brain (abstraction vs intuition).”

Abstract and analytical thinking is emphasized, whereas qualitative, pluralist or holistic thinking is not mentioned.

«Die Volkswirtschaftslehre beschäftigt sich mit der Frage, wie die Gesellschaft mit ihren **knappen Ressourcen** umgeht. Zunächst werden die Entscheidungen der einzelnen Wirtschaftseinheiten, d.h. der **Haushalte und der Unternehmen** analysiert. In einem nächsten Schritt wird untersucht, wie diese Vielzahl von Entscheidungen miteinander koordiniert wird und ob das Ergebnis aus gesamtwirtschaftlicher Sicht wünschenswert ist. Schliesslich werden die sich daraus ergebenden wirtschaftspolitischen Massnahmen, insbesondere im Hinblick auf Innovation, **Wachstum**, Arbeitslosigkeit und Inflation, untersucht.»

In English: “Economics deals with the question of how society deals with its **scarce resources**. First, the decisions of the individual business units, i.e. of **households and firms**. The next step is to examine how this large number of decisions are coordinated with one another and whether the result is desirable from a macroeconomic perspective. Finally, the resulting economic policy measures, particularly with regard to innovation, **growth**, unemployment and inflation, are examined.”

Why should economics deal only with scarce resources? Economics should also understand why abundant resources become scarce, or vice versa. The evolutionary and historical perspective is missing; a perspective limited to status quo and short-term.

“households and firms” as business units: Typical worldview of neoclassical economics; reducing economy to business realm.

“growth” is casually mentioned, as if it should be one of the most important measures of economic policies. (i.e. growth or GDP obsession)

“Auf Grund der **breit gefächerten Ausbildung** gehören die Volkswirte eher zu den **Generalisten** unter den Studienabgänger/innen. Ihre Beschäftigungssituation erweist sich als überdurchschnittlich gut. Der Übergang vom Studium zum Beruf verläuft in der Regel reibungslos. Der Anteil der Arbeitssuchenden mit einem Abschluss in Wirtschaftswissenschaften liegt traditionsgemäss weit unter dem der Stellensuchenden anderer Studienrichtungen.»

In English: “Due to the **wide range of training**, economists tend to be among the **generalists** among graduates. Your employment situation turns out to be above average. The transition from studies to work usually goes smoothly. The proportion of jobseekers with a degree in economics is traditionally far below that of jobseekers in other fields of study.”

Over-average job prospects; job-market oriented education...

Economists as generalists? Implies, economists have the ability to see the whole picture which is very questionable statement, especially if students are not properly trained in qualitative fields like philosophy of science, history of civilizations and ecology. A kind of “professional hubris”!

*Studienplan zum Studiengang Bachelor Volkswirtschaftslehre (lecture plan bachelor)*

[https://www.unibe.ch/e152701/e154048/e191232/e191242/e210671/wiso\\_sp\\_ba\\_vwl\\_final\\_ger.pdf](https://www.unibe.ch/e152701/e154048/e191232/e191242/e210671/wiso_sp_ba_vwl_final_ger.pdf)

## HAUPTSTUDIUM

**Art. 10** <sup>1</sup> Es sind die folgenden Lehrveranstaltungen obligatorisch zu besuchen:

- a „Mikroökonomie I“ (4.5 ECTS-Punkte),
- b „Makroökonomie I“ (4.5 ECTS-Punkte),
- c „Einführung in die Spieltheorie“ (4.5 ECTS-Punkte),
- d „Ökonometrie I“ (4.5 ECTS-Punkte),
- e zwei frei wählbare Seminare.

«Die weiteren Lehrveranstaltungen sind aus dem Lehrangebot der Volkswirtschaftslehre auf Bachelorstufe frei wählbar. Vorbehalten bleiben Zugangsbestimmungen zu einzelnen Lehrveranstaltungen sowie ein allfälliges Praktikum.»

In English: “The other courses can be freely selected from the economics courses at the Bachelor's level. The right to access individual courses and any internship are reserved.”

Terms like environment (Umwelt), ecology (Ökologie) or sustainability (Nachhaltigkeit) are not mentioned in this study plan.

*Volkswirtschaftliches Institut / Studieninteressierte*

[https://www.vwi.unibe.ch/studium/studieninteressierte/index\\_ger.html](https://www.vwi.unibe.ch/studium/studieninteressierte/index_ger.html)

«Das Departement Volkswirtschaftslehre bietet ein optimales Betreuungsverhältnis. Das forschungsorientierte und international ausgerichtete Departement ist zudem gut vernetzt mit Entscheidungsträgern aus Politik und Wirtschaft. Dank diesen Verbindungen kann das Departement namhafte Persönlichkeiten aus Wirtschaft, Politik und Wissenschaft als Dozenten engagieren.»

In English: “The Department of Economics offers an optimal supervisory relationship. The research-oriented and internationally oriented department is also well networked with decision-makers from politics and business. Thanks to these connections, the department can hire well-known personalities from business, politics and science as lecturers.”

As usual, a business-friendly economics department...

*Studienaufbau (course structure)*

[https://www.wiso.unibe.ch/studium/studienprogramme/bachelor\\_volkswirtschaftslehre/index\\_ger.html#pane21913](https://www.wiso.unibe.ch/studium/studienprogramme/bachelor_volkswirtschaftslehre/index_ger.html#pane21913)

«Für die StudienanfängerInnen der Volkswirtschaft, der Betriebswirtschaft und der Sozialwissenschaften sind die Vorlesungen des Einführungsstudiums weitgehend identisch. Das Einführungsstudium umfasst 60 ECTS und dauert gemäss der Regelstudienzeit ein Jahr. Alle Vorlesungen sind obligatorisch und werden nach einem festen Stundenplan durchgeführt.»

In English: “For new students in economics, business administration and social sciences, the lectures in the introductory course are largely identical. The introductory course comprises 60 ECTS and takes one year according to the standard period of study. All lectures are compulsory and are carried out according to a fixed timetable.”

## Veranstaltungen des Einführungsstudiums

### Herbstsemester

- Einführung in die Volkswirtschaftslehre
- Ausgewählte Anwendungen der Volkswirtschaftslehre
- Einführung in das Management
- Einführung in die Wirtschaftsinformatik
- Einführung in die Politikwissenschaft I
- Einführung in die Soziologie
- Statistik I
- Mathematik I
- Einführung in das Privatrecht

### Frühjahrssemester

- Einführung in die Makroökonomie
- Einführung in die Mikroökonomie
- Finanzielles Rechnungswesen I
- Einführung in das Finanzmanagement und das Rechnungswesen
- Einführung in das Marketing
- Einführung in die Methoden der empirischen Sozialforschung
- Statistik II
- Mathematik II
- Einführung in das öffentliche Recht

There is only one broad-view and qualitative lecture among compulsory lectures: Introduction to Sociology (Einführung in die Soziologie). Ecology or evolutionary/biological anthropology is excluded from the scope.

## E.2. Analysis of some popular university economics textbooks

This is the list of some popular economics textbooks I have analysed:

1. Principles of Economics, Mankiw, 7<sup>th</sup> edition, 2015
2. Microeconomics and Behaviour, Frank, 9<sup>th</sup> edition, 2015
3. Microeconomics, Hubbard & O'Brien, 4<sup>th</sup> edition, 2013
4. Microeconomics, Perloff, 7<sup>th</sup> edition, 2015
5. Microeconomics, Gravelle & Rees, 3rd edition, 2004
6. Intermediate Microeconomics, Varian, 8<sup>th</sup> edition, 2010
7. Macroeconomics, Blanchard, 6<sup>th</sup> edition, 2013
8. Macroeconomics, Mankiw, 7<sup>th</sup> edition, 2010

This is of course not an exhaustive list of all popular textbooks; neither are they the latest editions. These are the popular textbooks that I could find and download in internet in digital (pdf) form.

**Q1: Is there any hint about nonmonetary production of nature and society? (i.e. sustenance or subsistence economy, nonmarket economy) Or, the analysis is dedicated solely to monetary market economy? (i.e. business realm)**

Search "nonmonetary" in context:

Principles of Economics, Mankiw, 7 <sup>th</sup> edition, 2015	... some action that has both a monetary and <u>nonmonetary opportunity cost</u>
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	<p>... jobs also have differing characteristics both in terms of the wages they pay and in terms of their <u>nonmonetary attributes</u></p> <p>... Because these nonmonetary aspects [of jobs] are hard to measure</p> <p>... Through various government programs, however, the poor receive many <u>nonmonetary items</u>, including food stamps, housing vouchers, and medical services.</p> <p>... wealth is used to refer to the total of all stores of value, including both money and nonmonetary assets [stocks &amp; bonds]</p>
Microeconomics and Behaviour, Frank, 9 <sup>th</sup> edition, 2015	...
Microeconomics, Hubbard & O'Brien, 4 <sup>th</sup> edition, 2013	<p>... The doctor would also need to take into account the <u>nonmonetary cost</u> of spending another hour working</p> <p>... Consumers commonly commit the following three mistakes when making decisions: They take into account monetary costs but ignore <u>nonmonetary opportunity costs</u>.</p>
Microeconomics, Perloff, 7 <sup>th</sup> edition, 2015	...
Microeconomics, Gravelle & Rees, 3rd edition, 2004	...
Intermediate Microeconomics, Varian, 8 <sup>th</sup> edition, 2010	...
Macroeconomics, Blanchard, 6 <sup>th</sup> edition	...
Macroeconomics, Mankiw, 7 <sup>th</sup> edition, 2010	<p>... equilibrium level, at which people are content with their portfolios of monetary and nonmonetary assets.</p> <p>... and <u>nonmonetary assets</u> (stocks and bonds)</p>

Note: There is no mention of “nonmonetary production” of society or nature.

“nonmonetary production”: none

“nonmarket production”: none

“nonmonetary economy”: none

“primary producer”: none

“primary production”: none

“sustenance”: none

“nonmarket economy”: none

“primary producer”: none

“primary production”: none

Search “subsistence” in context:

Principles of Economics, Mankiw, 7 <sup>th</sup> edition, 2015	<p>... even if you’ve just lost your job, there’s something fundamentally churlish about blaming the very phenomenon that’s elevated you above the <u>subsistence level</u> since the day you were born (free trade)</p> <p>... He (Malthus) concluded that “the power of population is infinitely greater than the power in the earth to produce <u>subsistence</u> for man</p>
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Microeconomics and Behaviour, Frank, 9 <sup>th</sup> edition, 2015	... Rodriguez himself would surely be willing to perform for a <u>subsistence wage</u> rather than work in lifelong obscurity in some anonymous job elsewhere in the private sector.
Microeconomics, Hubbard & O'Brien, 4 <sup>th</sup> edition, 2013	... Based on Robert T. Jensen and Nolan H. Miller, "Giffen Behavior and <u>Subsistence Consumption</u> ," American Economic Review, Vol. 98, No. 4, September 2008, pp. 1553–1577.
Microeconomics, Perloff, 7 <sup>th</sup> edition, 2015	...
Microeconomics, Gravelle & Rees, 3rd edition, 2004	... Suppose that the consumer has lexicographic preferences, but must consume a minimum level of $x_2$ for <u>subsistence</u> ... What would be the demand functions with and without <u>subsistence</u> and satiation levels of each good? ... Show that the Stone–Geary utility function ... <u>subsistence consumption levels</u> , has an expenditure function of the form
Intermediate Microeconomics, Varian, 8 <sup>th</sup> edition, 2010	...
Macroeconomics, Blanchard, 6 <sup>th</sup> edition	... in India, where the prices of basic goods—those goods needed for <u>subsistence</u> —are much lower than in US
Macroeconomics, Mankiw, 7 <sup>th</sup> edition, 2010	... He (Malthus) concluded that “the power of population is infinitely greater than the power in the earth to produce subsistence for man

Note: Earth (or nature) as “primary producer” implied by Malthus, referenced in Mankiw’s books. “Nonmonetary subsistence economy” is not mentioned explicitly by any of the listed textbooks.

Search “nonmarket” in context:

Principles of Economics, Mankiw, 7 <sup>th</sup> edition, 2015	...
Microeconomics and Behaviour, Frank, 9 <sup>th</sup> edition, 2015	... such effects are examples of <u>nonmarket discrimination</u> —effects that lower productivity before job applicants even make contact with the employer.
Microeconomics, Hubbard & O'Brien, 4 <sup>th</sup> edition, 2013	...
Microeconomics, Perloff, 7 <sup>th</sup> edition, 2015	...
Microeconomics, Gravelle & Rees, 3rd edition, 2004	...
Intermediate Microeconomics, Varian, 8 <sup>th</sup> edition, 2010	...
Macroeconomics, Blanchard, 6 <sup>th</sup> edition	...
Macroeconomics, Mankiw, 7 <sup>th</sup> edition, 2010	...

Search “nature” (i.e. ecosystem) in context:

Principles of Economics, Mankiw, 7 <sup>th</sup> edition, 2015	... old song lyric maintains that “the best things in life are free.” <u>Nature</u> provides some of them, such as rivers, mountains, beaches, lakes, and oceans.
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	... A third determinant of productivity is natural resources. Natural resources are inputs into production that are provided by <u>nature</u> , such as land, rivers, and mineral deposits ... Oil is an example of a nonrenewable resource. Because oil is <u>produced by nature</u> over many millions of years, there is only a limited supply
Microeconomics and Behaviour, Frank, 9 <sup>th</sup> edition, 2015	... A society that reveres <u>nature and antiquity</u> may well decide the fate of the redwoods differently from one that holds other values ... For some products, particularly agricultural ones, <u>nature</u> has significant effects on the supply schedule
Microeconomics, Hubbard & O'Brien, 4 <sup>th</sup> edition, 2013	... Natural resources include land, water, oil, iron ore, and other raw materials (or “gifts of nature”) that are used in producing goods.
Microeconomics, Perloff, 7 <sup>th</sup> edition, 2015	... <u>Nature</u> forced the government to reduce water consumption ... where the pay-offs to the owner of a firm (the principal) and the manager (the agent) depend on the agent's actions and the <u>state of nature</u> , such as weather (which affects demand)
Microeconomics, Gravelle & Rees, 3rd edition, 2004	...
Intermediate Microeconomics, Varian, 8 <sup>th</sup> edition, 2010	... Let us think of the different outcomes of some random event as being different states of <u>nature</u> ... When a firm makes choices it faces many constraints. These constraints are imposed by its customers, by its competitors, and by <u>nature</u> ... <u>Nature</u> imposes technological constraints on firms ... There are other cases where the fixed factor is fixed not by <u>nature</u> , but by law
Macroeconomics, Blanchard, 6 <sup>th</sup> edition	... The word “natural” suggests a constant of <u>nature</u> , one that is unaffected by institutions and policy ... Factors like the generosity of unemployment benefits or antitrust legislation can hardly be thought of as the result of <u>nature</u>
Macroeconomics, Mankiw, 7 <sup>th</sup> edition, 2010	...

“ecosystem”: none

“anthropology”: none

“Because oil is produced by nature over many millions of years” in Mankiw’s microeconomics book is the only explicit reference to nature as an active producer. But in the same book, it is implied that nature (as a resource) can only deliver inputs for production: “Natural resources are inputs into production that are provided by nature”.

## Q2: Are the names and ideas of critical economic thinkers like Karl Marx and Thorstein Veblen mentioned in textbooks?

Some popular microeconomics textbooks	friedman	hayek	coase	ostrom	daly	roegen	veblen	marx	smith	ricardo
Principles of Economics, Mankiw, 7th ed, 2015	38	0	20	0	0	0	0	0	22	9
Microeconomics and Behaviour, Frank, 9th ed, 2015	14	0	20	0	0	0	0	0	14	0
Microeconomics, Hubbard & O'Brien, 4th ed, 2013	3	0	24	0	0	0	0	0	8	5
Microeconomics, Perloff, 7th ed, 2015	3	0	7	0	0	0	0	0	2	0
Microeconomics, Gravelle & Rees, 3rd ed, 2004	3	0	8	0	0	0	0	0	1	0
Intermediate Microeconomics, Varian, 8th ed, 2010	0	0	10	0	0	0	0	1	1	0

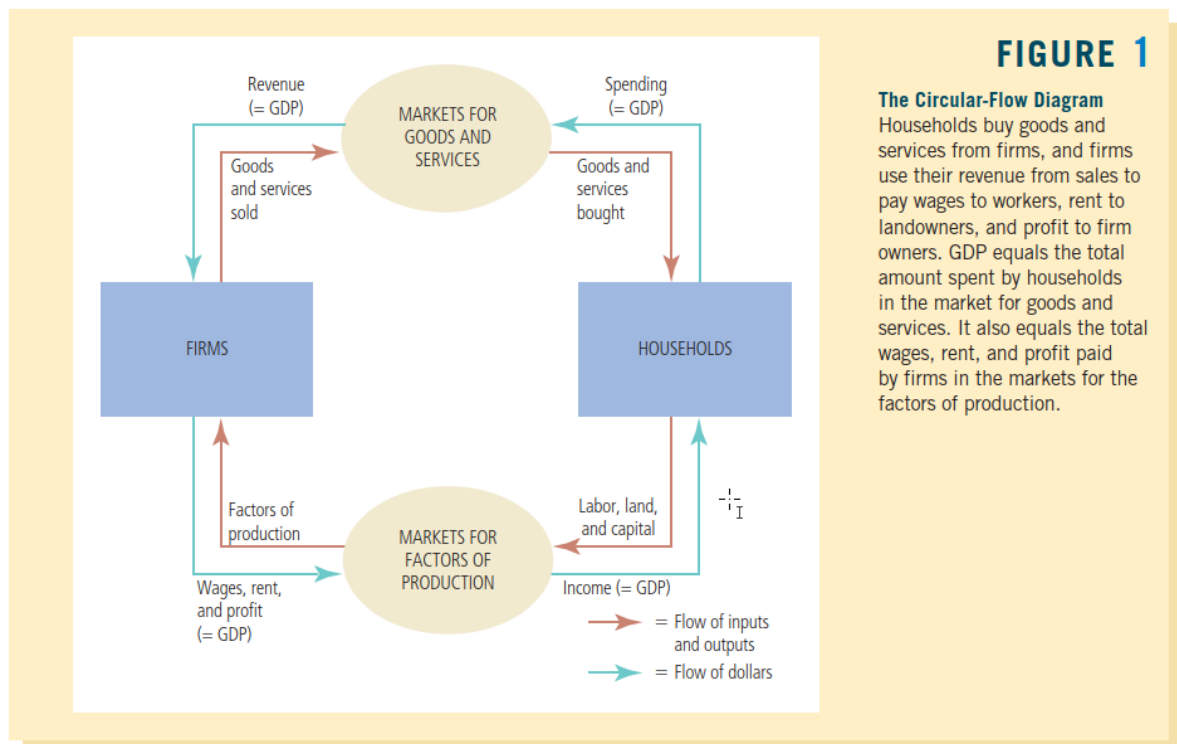
Yellow marked: Socially or ecologically critical thinkers like Karl Marx, Thorstein Veblen, Elinor Ostrom, Herman Daly, Georgescu-Roegen

The name “Marx” is mentioned only once in Varian’s book in the context of “Marxist-orthodox Chinese regime” without mentioning the ideas of Marx.

It is striking that even the names of critical economic thinkers (i.e. critical in the social or ecological sense) are not mentioned in most popular economics textbooks; so much for theoretical and ideological pluralism.

### Q3: What is the place of nature in GDP flowcharts in macroeconomics textbooks?

1) *Principles of Economics, Mankiw, 7th edition, 2015*



Note: Typical GDP flow diagram as a closed system that excludes nature. Society is reduced to households (consumers) and firms (producers). Excluding nature means, factors like nonmonetary production of nature and physical or ecological limits of nature are hidden from the perception of students.

**Definition:** “Gross domestic product (GDP) is the market value of all final goods and services produced within a country in a given period of time.”

“GDP excludes most items produced and sold illicitly, such as illegal drugs. It also excludes most items that are produced and consumed at home and, therefore, never enter the marketplace.

Vegetables you buy at the grocery store are part of GDP; vegetables you grow in your garden are not.”

These exclusions from GDP can at times lead to paradoxical results. For example, when Karen pays Doug to mow her lawn, that transaction is part of GDP. But suppose Doug and Karen marry. Even though Doug may continue to mow Karen’s lawn, the value of the mowing is now left out of GDP because Doug’s service is no longer sold in a market. Thus, their marriage reduces GDP.”

Mankiw gives here two examples of nonmonetary production, but he fails to warn the student in a more general way: GDP excludes nonmonetary production of nature and society. I wonder, what portion of students can make this important generalisation themselves.

### 23-5 Is GDP a Good Measure of economic Well-Being? (page 495)

“Much of what Robert Kennedy [criticism of GDP measure] said is correct. Why, then, do we care about GDP? The answer is that a large GDP does in fact help us to lead good lives. GDP does not measure the health of our children, but nations with larger GDP can afford better healthcare for their children.”

“GDP does not measure the quality of their education, but nations with larger GDP can afford better educational systems. GDP does not measure the beauty of our poetry, but nations with larger GDP can afford to teach more of their citizens to read and enjoy poetry. GDP does not take account of our intelligence, integrity, courage, wisdom, or devotion to country, but all of these laudable attributes are easier to foster when people are less concerned about being able to afford the material necessities of life. In short, GDP does not directly measure those things that make life worthwhile, but it does measure our ability to obtain many of the inputs into a worthwhile life.”

In short, Mankiw says, GDP is a good measure of life-quality, which is wrong. He ignores the fact that GDP (monetary production) can be increased at the cost of social and environmental degradation, that has detrimental effects on human health and welfare.

“Another thing that GDP excludes is the quality of the environment. Imagine that the government eliminated all environmental regulations. Firms could then produce goods and services without considering the pollution they create, and GDP might rise. Yet well-being would most likely fall. The deterioration in the quality of air and water would more than offset the gains from greater production.”

Environment (or nature) is mentioned here as a passive entity (passive like a house; i.e. not an active reproducer) that must be kept clean for human health. It is totally ignored that nature is an active living reproducer (i.e. producer and recycler) with unimaginably complex distributed organic intelligence.

“The average income in a rich country, such as the United States, Japan, or Germany, is more than ten times the average income in a poor country, such as India, Indonesia, or Nigeria. These large differences in income are reflected in large differences in the quality of life. People in richer countries have better nutrition, safer housing, better healthcare, and longer life expectancy as well as more automobiles, more telephones, and more televisions.”

These claims ignore the logic of global industrial imperialism: How did rich (i.e. high GDP) countries become rich? Maybe at the cost of other countries (i.e. social and ecological exploitation)? If GDP is a measure of monetarisation, monopolisation and exploitation rather than production in the positive sense, how can “economic growth” be offered as a receipt for well-being to every country in the world? Considering that earth has physical and ecological limits, there can only be a few rich countries that exploit all others.

It is also remarkable that technological tools like automobiles, telephones and televisions are presented as an end in themselves; as if they were ideal proxies for well-being! (i.e. technological fundamentalism, confusing means with ends). If a technology has any value for a society depends on the culture and lifestyle of this society, and every society can have different values, priorities, culture and lifestyle. For example, a society may prefer slow, healthy and sustainable transport to fast, unhealthy and unsustainable transport.

“What explains these diverse experiences? How can rich countries maintain their high standard of living?”

Is there really a high standard of living for every society in the world? How determines these standards? Does the high-consumption Western life-style represent a higher living-standard? (implied: Western ideology of progress, cultural centralism).

“The level of real GDP is a good gauge of economic prosperity, and the growth of real GDP is a good gauge of economic progress.”

So, we are told that GDP is a good proxy for economic prosperity. Undisputed single-truth and dogmatic teaching style. It ignores the fact that average well-being (i.e. happiness measures) decreased in many countries including UK, despite almost continuous increase in GDP.

2) *Macroeconomics, Blanchard, 6<sup>th</sup> edition, 2013*

“GDP: Production and Income: The measure of aggregate output in the national income accounts is called the gross domestic product, or GDP, for short. To understand how GDP is constructed, it is best to work with a simple example. Consider an economy composed of just two firms: ...”

After this introduction, one gets the feeling that “firms” are the only producers worth mentioning in an economy.

“1. GDP Is the Value of the Final Goods and Services Produced in the Economy during a Given Period. The important word here is final. We want to count only the production of final goods, not intermediate goods.”

This phrase doesn't warn the student that GDP is only about monetary goods and services, excluding nonmonetary goods and services offered by the society and nature. Remains to be seen, if there is a warning in that line in following paragraphs.

“2. GDP Is the Sum of Value Added in the Economy during a Given Period. The term value added means exactly what it suggests. The value added by a firm is defined as the value of its production minus the value of the intermediate goods used in production.”

“To summarize: You can think about aggregate output— GDP—in three different but equivalent ways.

- From the production side: GDP equals the value of the final goods and services produced in the economy during a given period.
- Also from the production side: GDP is the sum of value added in the economy during a given period.
- From the income side: GDP is the sum of incomes in the economy during a given period.”

Again, student is not warned in this summary that GDP is mainly about monetary production of market goods and services aside from government spending.

“Because it is a measure of aggregate activity, GDP is obviously the most important macroeconomic variable. But two other variables, unemployment and inflation, tell us about other important aspects of how an economy is performing.”

So, it is established here as an undisputable scientific fact (!) that GDP is the most important macroeconomic measure. It is also remarkable that distribution or poverty is not mentioned among most important macroeconomic measures.



“From this viewpoint, can very low unemployment also be a problem? The answer is yes. Like an engine running at too high a speed, an economy in which unemployment is very low may be overutilizing its resources and run into labour shortages.”

Interesting viewpoint, as if the efficient running of an economy is a higher goal than human wellbeing.

Without warning the students that GDP is only about monetary flows, the lecture goes on with mathematics of GDP: GDP deflator, Consumer Price Index, Inflation, Okun’s Law, Philips Curve...

Note: Terms like nonmonetary, nonmarket, sustenance or subsistence economy don’t exist in this textbook.

There is an essay titled “Does Money Lead to Happiness?” on page 212 with important information for students:

“The first two facts suggested that, once basic needs are satisfied, higher income per person does not increase happiness. The third fact suggested that what was important was not the absolute level of income but the level of income relative to others.”

“In rich countries, policies aimed at increasing income per person might be misdirected because what matters is the distribution of income rather than its average level.”

It must be critically questioned: Is a country a poor country, if its GDP is very low, but its nonmonetary sustenance economy is sufficiently large and equitable to cover everyone’s basic needs? What if this country begins to destroy its nonmonetary economy and equitable distribution in order to raise its GDP?

Search after words related with global and broad-view:

Lauderdale (Paradox): none

exploitation: none

imperialism: none

colonialism: none

So, a sterile and allegedly benevolent language purged from the unpleasant realities of life.

Summary of Chapter 10, The Facts of Growth:

“On the scale of human history, sustained output growth is a recent phenomenon.”

This claim confuses “relatively longer-term growth” with “sustainable growth” as if such a growth can continue forever; it does not consider social changes in geological and ecological timescale (i.e. lack of historicity and ecological consciousness).

“Sustained growth of output per person is ultimately due to technological progress. Perhaps the most important question in growth theory is what the determinants of technological progress are.”

Ignores nature as the primary producer, ignores physical and ecological limits to growth, talks of technology as if technology alone could solve every kind of social and ecological problem (i.e. technological fundamentalism).

**Q4: Are the students warned about long-term and wide-reaching adverse effects (i.e. externalities) of allegedly advanced technologies? Or do they hear only positive things about technology, like technological progress, as if technological progress could solve every kind of social and ecological problem in the world? (technological optimism)**

An example from history: DDT based insecticides pesticides were promoted as “symbol of technological progress” and “symbol of humanity’s triumph in its war against nature” by the mainstream media and chemical companies like Monsanto and DuPont, until they were banned in 1970’s in most countries of the world due to their detrimental effects to nature and humans (see “Silent Spring” by Rachel Carson).

*Search “technology” or “technological” in context:*

Principles of Economics, Mankiw, 7 <sup>th</sup> edition, 2015	<p>... To boost living standards, policymakers need to raise productivity by ensuring that workers are well educated, have the tools they need to produce goods and services, and have access to the best available <u>technology</u>.</p> <p>... available <u>production technology</u> that firms use to turn these factors into output.</p> <p>... By reducing firms’ costs, the <u>advance in technology</u> raised the supply of ice cream.</p> <p>... You monitor weather and soil conditions, check your fields for pests and disease, and study the <u>latest advances in farm technology</u>. You know that the more wheat you grow, the more you will have to sell after the harvest, and the higher your income and standard of living will be</p> <p>... Yet over time, <u>advances in farm technology</u> increased the amount of food that each farmer could produce. This increase in food supply, together with inelastic food demand, caused farm revenues to fall, which in turn encouraged people to leave farming</p> <p>... Thus, free international trade increases variety for consumers, allows firms to take <u>advantage of economies of scale</u>, makes markets more competitive, and facilitates the <u>spread of technology</u></p> <p>... A potentially important type of positive externality is called a technology spillover—the impact of one firm’s research and production efforts on other firms’ access to technological advance.</p> <p>... Thus, the <u>patent system</u> gives firms a greater incentive to engage in research and other <u>activities that advance technology</u></p> <p>... Other times the EPA requires that firms adopt a <u>particular technology</u> to reduce emissions</p> <p>... By contrast, the tax gives the factories an incentive to develop <u>cleaner technologies</u> because a cleaner technology would reduce the amount of tax the factory has to pay.</p> <p>... It would also promote energy conservation and steer investment into clean technology and other productive economic activities.</p> <p>... Policymakers have proposed various ways to stem the rise in healthcare costs, such as reducing the burden of lawsuits on the healthcare system, encouraging more competition among healthcare providers, promoting greater use of <u>information technology</u>.</p> <p>... What happens to Hi-Tech’s profits and the price of books in the short run when Hi-Tech’s patent prevents other firms from using the <u>new technology</u>?</p> <p>... This has made computers more reliable and easier to use because consumers can be confident that the pieces work together. The integration of <u>Internet technology</u>, <u>Microsoft</u> argued, was the natural next step</p>
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	<p>... We have an extremely important group of high-skilled immigrants. We rely on them to fill high-level jobs in health, science, <u>technology</u>, and engineering</p> <p>... The second hypothesis is that <u>changes in technology</u> have altered the relative demand for skilled and unskilled labor. Consider, for instance, the introduction of computers</p> <p>... <u>Here is how economists explain this historical pattern</u>: Over time, <u>advances in technology</u> raise workers' productivity and, thereby, the demand for labor.</p> <p>... A hundred years ago, most Americans worked on farms because farm technology required a high input of labor to feed the entire population. Today, thanks to <u>advances in farming technology</u>, a small fraction of the population can produce enough food to feed the entire country.</p> <p>... A is a variable that reflects the available <u>production technology</u>. <u>as technology improves</u>, A rises, so the economy produces more output from any given combination of inputs.</p> <p>... <u>Technological knowledge</u> takes many forms. Some technology is <u>common knowledge</u>—after one person uses it, everyone becomes aware of it. Other technology is <u>proprietary</u>—it is known only by the company that discovers it. Only the Coca-Cola Company, for instance, knows the secret recipe for making its famous soft drink. Still other technology is proprietary for a short time. When a pharmaceutical company discovers a new drug, the patent system gives that company a temporary right to be its exclusive manufacturer.</p> <p>... Other determinants of output, including human capital, natural resources, and <u>technology</u>, are held constant.</p> <p>... A country that eliminates trade restrictions will, therefore, experience the same kind of <u>economic growth</u> that would occur after a <u>major technological advance</u>.</p> <p>... In fact, as we discussed in the chapter on production and growth, real incomes are determined by real variables, such as physical capital, human capital, natural resources, and the available <u>production technology</u></p> <p>... By contrast, goods produced with <u>modern technology</u> are often light and easy to transport.</p> <p>... 13.4 to 17.8 percent of GDP, as the economy enjoyed a boom in <u>information technology</u> and many firms were eager to make these <u>high-tech investments</u></p> <p>... In the long run, an economy's production of goods and services (its real GDP) depends on its supplies of labor, capital, and natural resources and on the <u>available technology</u> used to turn these factors of production into goods and services.</p> <p>... Although many forces influence the economy in the long run and can in theory cause such shifts, the two most important forces in practice are <u>technology</u> and monetary policy. <u>Technological progress</u> enhances an economy's ability to produce goods and services</p> <p>... For example, suppose a <u>technological advance</u> in the computer industry raises the number of computers that a worker can produce per week.</p> <p>... Enhanced flow of ideas. The <u>transfer of technological advances</u> around the world is often thought to be linked to the trading of the goods that embody those advances.</p>
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	<p>... Everyone understands that the displacement of workers in outmoded industries is an inevitable part of <u>technological progress</u> and economic growth.</p> <p>... This new design may benefit not only this firm but also society as a whole because the design will enter society's pool of <u>technological knowledge</u>.</p> <p>... This is an important question because <u>technological progress</u> is the key to <u>why living standards rise over time</u></p> <p>... Another way to deal with <u>technology spillovers</u> is patent protection. When a firm makes a <u>technological breakthrough</u>, it can patent the idea and capture much of the economic benefit for itself. The <u>patent internalizes the externality</u> by giving the firm a property right over its invention</p> <p>... Trying to eliminate all pollution would reverse many of the <u>technological advances</u> that allow us to enjoy a <u>high standard of living</u>. Few people would be willing to accept poor nutrition, inadequate medical care, or shoddy housing to make the environment as clean as possible.</p> <p>... <u>Knowledge is created through research</u>. In evaluating the appropriate public policy toward knowledge creation, it is important to distinguish general knowledge from specific <u>technological knowledge</u></p> <p>... It is often argued that this policy increases the <u>technological capability</u> of American producers relative to that of foreign firms</p> <p>... <u>Microsoft</u> responded by pointing out that putting new features into old products is a natural part of <u>technological progress</u></p> <p>... It is also possible for <u>technological change</u> to reduce labor demand</p> <p>... History suggests, however, that most <u>technological progress</u> is instead labor-augmenting. Such <u>technological advance</u> explains persistently rising employment in the face of rising wages:</p> <p>...</p> <p>Most common phrases:</p> <ul style="list-style-type: none"> <li>- technological advances</li> <li>- technological progress</li> <li>- technological knowledge</li> <li>- advances in technology</li> <li>- production technology</li> </ul>
Microeconomics and Behaviour, Frank, 9 <sup>th</sup> edition, 2015	<p>... Supply schedules, in turn, are governed by such factors as <u>technology</u>, input prices, the number of suppliers, expectations, and, for agricultural products, the weather.</p> <p>... What Malthus did not foresee was the explosive growth in <u>agricultural technology</u> that has far outstripped the effect of a fixed supply of land. Still, the ruthless logic of Malthus's observation remains. No matter <u>how advanced our technology</u>, if population continues to grow, it is just a matter of time before limits on arable land spell persistent food shortages.</p> <p>... market survival requires firms to have the lowest unit costs possible under existing <u>production technology</u></p> <p>... As <u>technology continues to advance</u>, and with it the scale of the most efficient farms, the stage is now set for another round of distress for family farms and the attendant pressure to increase the government price support level.</p>

	<p>... As the late Harvard University economist Harvey Leibenstein emphasized, an organization's costs depend not just on its <u>technology</u>, but also on the vigor with which it pursues <u>efficiency</u></p> <p>... But it should caution us against uncritical acceptance of claims that monopolists always deprive consumers of the <u>benefits of the latest available technology</u>.</p> <p>... if newer, more efficient machines are being designed each year, an existing machine may lose its economic value overnight, even though it continues to function exactly as it did when new. This phenomenon is called <u>technological obsolescence</u></p> <p>... Suppose that because of breakthroughs in <u>superconductor technology</u>, the price of solar energy falls by half</p> <p>... The box in the diagram embodies the existing state of <u>technological knowledge</u>.</p> <p>... <u>Technological improvements</u> in production are represented graphically by an upward shift in the production function</p> <p>... The Effect of <u>Technological Progress</u> in Food Production</p> <p>... monopolists deprive consumers of a spectrum of enormously valuable <u>technological innovations</u></p> <p>... physical and <u>technological depreciation</u></p> <p>... we don't know exactly how much solar energy will cost once we run out of oil, for that depends on <u>technological developments</u> that are difficult to foretell</p>
Macroeconomics, Blanchard, 6 <sup>th</sup> edition	<p>... How much can be produced depends on how advanced the <u>technology</u> of the country is, how much capital it is using, and the size and the skills of its labor force</p> <p>... Over the medium run, the economy tends to return to the level of output determined by supply factors: the capital stock, the <u>level of technology</u>, and the size of the labor force</p> <p>... is the marginal cost function that would result from the <u>production technology</u>,</p> <p>... In other words, what determines how much output can be produced for given quantities of capital and labor? The answer: the <u>state of technology</u>. A country with a more <u>advanced technology</u> will produce more output from the same quantities of capital and labor than will an economy with a <u>primitive technology</u>.</p> <p>... For a given level of capital per worker, <u>the improvement in technology</u> leads to an increase in output per worker.</p> <p>... Hence, we can think of <u>growth</u> as coming from capital accumulation and from <u>technological progress</u>—the improvement in the <u>state of technology</u>.</p> <p>... Think of the introduction of the CD or MP3 player, the fax machine, wireless <u>communication technology</u> in all its variants, flat screen monitors, and high-definition television.</p> <p>... The Focus box "The <u>Diffusion of New Technology</u>: <u>Hybrid Corn</u></p> <p>... But the benefits of <u>low patent protection</u> are clear: They allow domestic firms to use and adapt <u>foreign technology</u> without having to pay royalties to the foreign firms that developed the technology—which is good for the country.</p> <p>... Thus, over time, they become more sophisticated, either by importing <u>technology</u> from <u>advanced countries</u> or developing their own.</p>



	<p>... The prospect of higher profits in the future, as well as the need to put the <u>new technology</u> in place, may also lead to a boom in investment.</p> <p>... a change in productivity that comes from a <u>change in technology</u>, not from the response of firms to movements in output.</p> <p>... What happens to the labor demand curve if the <u>level of technology</u> improves?</p> <p>... Chapters 11 and 12 develop a model of growth and describe how capital accumulation and <u>technological progress</u> determine growth.</p> <p>... The <u>technological sophistication</u> of a country depends on its ability to innovate and introduce new technologies.</p> <p>... <b>Sustained growth</b> requires <u>sustained technological progress</u></p> <p>... Yet the most important <u>technological advances</u> of that period were made in the United States.</p> <p>The term “technological progress” is repeated many times in the text.</p> <p>Search for “sustainab” (sustainable, sustainability)</p> <p>... What is the highest <u>sustainable</u> level of consumption such that consumption is equal in all three periods?</p> <p>... the best ability to finance fiscal expansion, and the most clearly <u>sustainable debt</u> should take the lead</p> <p>... Trying to achieve too high a level of output can, for example, lead to increasing inflation and, for that reason, be <u>unsustainable</u> in the medium run</p> <p>externality or externalities: none</p> <p>side-effect: none</p>
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#### Observations:

- The term “technology” is often used in phrases like technological progress, technological advances, technological improvements, technological spillovers, technological knowledge and so on. There is no hint at all in the whole content about some negative (social and ecological) externalities of technologies (i.e. technological optimism and fundamentalism)
- Academic or corporate research (which produces new advanced technologies) is presented as the only source of information. Nature and society (culture, tradition, evolutionary history) are excluded from the list of information sources (i.e. mechanistic reductionism and reducing economy to business realm)
- Nowhere in these textbooks I could find any hint about critical questions like “what are the long-term and wide-reaching consequences of an allegedly advanced technology like industrial agriculture (i.e. mechanistic agriculture based on ecologically unsustainable monocultures of wheat, corn, cotton etc. with lots of GM seeds, chemical fertilizers and pesticides)?” or, “what makes a technology socially/ecologically sustainable or unsustainable?”

## 10-2d Objections to the Economic Analysis of Pollution

"We cannot give anyone the option of polluting for a fee." This comment by the late Senator Edmund Muskie reflects the view of some environmentalists. Clean air and clean water, they argue, are fundamental human rights that should not be debased by considering them in economic terms. How can you put a price on clean air and clean water? The environment is so important, they claim, that we should protect it as much as possible, regardless of the cost.

Economists have little sympathy for this type of argument. To economists, good environmental policy begins by acknowledging the first of the *Ten Principles of Economics* in Chapter 1: People face trade-offs. Certainly, clean air and clean water have value. But their value must be compared to their opportunity cost—that is, to what one must give up to obtain them. Eliminating all pollution is impossible. Trying to eliminate all pollution would reverse many of the technological advances that allow us to enjoy a high standard of living. Few people would be willing to accept poor nutrition, inadequate medical care, or shoddy housing to make the environment as clean as possible.

"healthcare" disconnected from the health of environment (!)

Economists argue that some environmental activists hurt their own cause by not thinking in economic terms. A clean environment can be viewed as simply another good. Like all normal goods, it has a positive income elasticity: Rich countries can afford a cleaner environment than poor ones and, therefore, usually have more rigorous environmental protection. In addition, like most other goods, clean air and clean water obey the law of demand: The lower the price of environmental protection, the more the public will want. The economic approach of using pollution permits and corrective taxes reduces the cost of environmental protection and should, therefore, increase the public's demand for a clean environment.

clean environment as luxury good (!)

This paragraph in "Principles of Economics, Mankiw, 7<sup>th</sup> edition" is quite demonstrative for many features of neoliberal economics education:

- Stupid environmentalists vs clever economists; typical neoliberal and neoconservative propaganda: "Greens are the new red!"
- Phrases like "economists argue...": An opinion is presented as if it were an obvious, undisputed fact! Dogmatic, single-truth teaching style.
- Environmentalism and human health are presented as opposite poles by disconnecting "healthcare" from the health of environment; i.e. by reducing "healthcare" to industrial health services like medicine, treatment and hospital (mechanistic reductionism in human health).

**Q5: Sustainable use of common resources like pastures, forests and fisheries: Are the ideas of Ostrom mentioned (i.e. sustainable use of common resources by local communities), or is it mainly about "Tragedy of the Commons", Coase, state regulation and property rights?**

*Overview to Ostrom's work:*

Elinor Ostrom on managing "common pool" resources (YouTube video)

<https://www.youtube.com/watch?v=D1xwV2UDPAg>

Elinor Ostrom: Sustainable development and the tragedy of commons (YouTube video)

<https://www.youtube.com/watch?v=ByXM47Ri1Kc>

Ostrom emphasizes in this video the importance of local knowledge to deal with the complexity of local resources, which was often overlooked or undervalued by colonial powers (i.e. underestimating the capabilities of social, cultural, organic intelligence of diversity-rich local communities).

Elinor Ostrom's Core Design Principles [for sustainable use of common resources] (YouTube video)

<https://www.youtube.com/watch?v=9mJXUC2Hc7w>

Garrett Hardin on the Tragedy of the Commons (YouTube video)

<https://www.youtube.com/watch?v=g8yOamWq3a0>

The Tragedy of the Commons | How to Avoid It? (YouTube video)

<https://www.youtube.com/watch?v=tLnA0AO2lXA>

*Proposed solutions to “Tragedy of the Commons” in microeconomics textbooks*

Principles of Economics, Mankiw, 7 <sup>th</sup> edition, 2015	<p><i>Keyword search:</i> tragedy of the commons: yes Coase theorem: yes Hardin: no Ostrom: no</p> <p><i>Proposed solutions:</i> Cost-Benefit Analysis (price of life?) Government regulation Privatisation (private ownership of land, property rights)</p>
Microeconomics and Behaviour, Frank, 9 <sup>th</sup> edition, 2015	<p><i>Keyword search:</i> tragedy of the commons: yes Coase theorem: yes Hardin: no Ostrom: no</p> <p><i>Proposed solutions:</i> Government regulation (e.g. taxing externalities, unregulated contests, positional externalities) Privatisation (private ownership of land, property rights)</p>
Microeconomics, Hubbard & O'Brien, 4 <sup>th</sup> edition, 2013	<p><i>Keyword search:</i> tragedy of the commons: yes Coase theorem: yes Hardin: no Ostrom: no</p> <p><i>Proposed solutions:</i> Private property (property rights) Community laws and norms Government regulations</p> <p>In summary: “Externalities arise when property rights do not exist or cannot be legally enforced. <b>Property rights are the rights individuals or businesses have</b> to the exclusive use of their property, including the right to buy or sell it.”</p>
Microeconomics, Perloff, 7 <sup>th</sup> edition, 2015	<p><i>Keyword search:</i> tragedy of the commons: no Coase theorem: yes Hardin: no Ostrom: no</p> <p><i>Proposed solutions:</i> Property rights (i.e. private ownership) Markets for pollution Government regulation (e.g. tax or limit output)</p>

<p>Microeconomics, Gravelle &amp; Rees, 3rd edition, 2004</p>	<p><i>Keyword search:</i> tragedy of the commons: no Coase theorem: yes Hardin: no Ostrom: no</p> <p><i>Proposed solutions:</i> Private property Government regulation</p> <p>(instances of market failure: monopoly, externalities, too much mathematics, no summary information)</p>
<p>Intermediate Microeconomics, Varian, 8<sup>th</sup> edition, 2010</p>	<p><i>Keyword search:</i> tragedy of the commons: yes Coase theorem: yes Hardin: yes (as reference) Ostrom: no</p> <p>“Externalities” as chapter 34</p> <p>“All interactions between consumers and producers took place via the market, so that all the economic agents needed to know were the market prices and their own consumption or production possibilities. In this chapter we will relax this assumption and examine the economic consequences of externalities.”</p> <p>“In earlier chapters we saw that the market mechanism was capable of achieving <b>Pareto efficient allocations</b> when externalities were not present. If externalities are present, the market will not necessarily result in a Pareto efficient provision of resources.”</p> <p>Implied: Externalities as exceptional cases</p> <p><i>Proposed solutions:</i> Property rights Government regulation</p> <p>“Of course, <b>private property is not the only social institution</b> that can encourage efficient use of resources. For example, rules could be formulated about how many cows can be grazed on the village common.”</p> <p>In Summary: 6) Cures for production externalities include the use of Pigouvian taxes, setting up a market for the externality, simply allowing firms to merge, or transferring property rights in other ways. 7. The tragedy of the commons refers to the tendency for common property to be overused. This is a particularly prevalent form of externality.</p> <p>Neither Ostrom’s principles, nor local traditions for sustainable use of common resources are mentioned.</p>

**Q6: Do popular economics textbooks include dirty words like exploitation, imperialism and colonialism that reflect unpleasant realities of life?**

Search for keywords: exploitation, imperialism, colonialism, parasitic (investments, technologies, investors, companies, earnings etc.)

<b>Dirty words in popular economics textbooks</b>	<b>exploitation</b>	<b>colonialism</b>	<b>imperialism</b>	<b>parasitic</b>
Principles of Economics, Mankiw, 7th ed, 2015	0	0	0	0
Microeconomics and Behaviour, Frank, 9th ed, 2015	6	0	0	0
Microeconomics, Hubbard & O'Brien, 4th ed, 2013	0	0	0	0
Microeconomics, Perloff, 7th ed, 2015	1	0	0	0
Microeconomics, Gravelle & Rees, 3rd ed, 2004	0	0	0	0
Intermediate Microeconomics, Varian, 8th ed, 2010	0	0	0	0
Macroeconomics, Blanchard, 6th edition, 2013	0	0	0	0
Macroeconomics, Mankiw, 7th edition, 2010	0	0	0	0

Benevolent world of economics: Sterile science (!) purged from unpleasant realities of life like exploitation, imperialism and power relations (think clean, stay clean)



## R. REFERENCES

Brand U. & Wissen M. (2017). Imperiale Lebensweise: Zur Ausbeutung von Mensch und Natur in Zeiten des globalen Kapitalismus. Oekom Verlag. (In English: Imperial Lifestyle: On the Exploitation of Human and Nature in the era of global capitalism)

Bradley P. (2019). Integrating sustainable development into economics curriculum: A case study analysis and sector wide survey of barriers (UK). Journal of Cleaner Production.  
<https://blogs.uwe.ac.uk/economics-finance/integrating-sustainable-development-into-economics-curriculum/>

Brewer J. (2019, July 25). 2019 Conference Day 2 Village 3 [video]. YouTube.  
<https://www.youtube.com/watch?v=43VNGXsJtAw&feature=youtu.be&t=1020> (at 17:00, neoliberalism in economics and Mont Pelerin Society)

Brewer J. (2016, September 13). The Parasitic Logic of Profit-Making  
[https://medium.com/@joe\\_brewer/the-parasitic-logic-of-profit-making-a8969fd3100b](https://medium.com/@joe_brewer/the-parasitic-logic-of-profit-making-a8969fd3100b) (Joe Brewer is a cognitive scientist)

Brown G.M.F. (2018, September 6). Parasitic Capitalism Exposed. Socialist Alternative.  
<https://www.socialistalternative.org/2018/09/06/parasitic-capitalism-exposed/> (George Martin Fell Brown comments on Mariana Mazzucato's book The Value of Everything)

Canterberry E.R. (2011). A Brief History of Economics, 2<sup>nd</sup> Edition. (Green Revolution, page 76)

Carson R. (1962). Silent Spring. Houghton Mifflin Harcourt.

Capra F. and Luisi P.L. (2014). The Systems View of Life: A Unifying Vision. Cambridge University Press.

coreecon. [List of Great Economists](#) (by CORE Schools Economics Challenge. Revolutionary economic thinkers like Veblen, Gandhi and E.F. Schumacher are missing in the list)

CrashCourse (2015, November 6). Economic Schools of Thought: Crash Course Economics #14 [video]. YouTube. [https://www.youtube.com/watch?time\\_continue=2&v=tZvjh1dxz08](https://www.youtube.com/watch?time_continue=2&v=tZvjh1dxz08) (typical crash course for the mainstream economic thought; “increased productivity of agriculture thanks to technological progress ...”, presentation of a business propaganda (green revolution) as if it were an undisputed scientific fact.)

CSEP Survey of Economics Students: Is it Time for Change at Cambridge? (2014 June)  
<https://drive.google.com/file/d/14jYq-SlkwL4ns4Xx4-eInjQlulC3h2c0/view> (CSEP: Cambridge Society for Economic Pluralism)

Dale G. (after 2010). Origins and Delusions of Green Growth. ISR: International Socialist Review.  
<https://isreview.org/issue/97/origins-and-delusions-green-growth>

Daly H, 2019. Growthism: its ecological, economic and ethical limits. [Economics and the Ecosystem](#) edited by E. Fullbrook and J. Morgan  
<https://www.resilience.org/stories/2019-03-28/growthism-its-ecological-economic-and-ethical-limits/>

Diamond J. (2005). Collapse: How Societies Choose to Fail or Survive. Penguin Books.

- Douthwaite R. (1999). The Growth Illusion: How economic growth has enriched the few, impoverished many and endangered the planet. Green Books Ltd.
- Earle J., Moran C., Ward-Perkins Z. (2017). The Econocracy: On the Perils of Leaving Economics to the Experts. Penguin Books. (→ Reviews: [Manchester University Press](#) – [Guardian: How three students caused a global crisis in economics](#))
- Education for Sustainable Living. [www.ecoliteracy.org](http://www.ecoliteracy.org)
- EvoTevo (2017, June 27). Elinor Ostrom's Core Design Principles [video]. YouTube. <https://www.youtube.com/watch?v=9mJXUC2Hc7w>
- Farrell K.N. (2019). Producing ecological economy. [Economics and the Ecosystem](#) edited by E. Fullbrook and J. Morgan. <http://www.paecon.net/PAEReview/issue87/Farrell87.pdf>
- Felber C. (2019, September 4). The fake Nobel Prize that helped neoliberalism conquer the world. Left Foot Forward. <https://leftfootforward.org/2019/09/the-fake-nobel-prize-that-helped-neoliberalism-conquer-the-world/>
- Fioramonti L. (2017. Professor Lorenzo Fioramonti - The Wrong Economic Trajectory [video]. YouTube. [https://www.youtube.com/watch?time\\_continue=261&v=K-PNPknMRZw](https://www.youtube.com/watch?time_continue=261&v=K-PNPknMRZw) (at 4:20, 20 largest industries of the world cause more social & ecological damage than their total profits)
- Fischer et al. (2018). Rethinking Economics: An Introduction to Pluralist Economics. Routledge.
- Fonseca GL. An Overview to (mainstream) Schools of Economic Thought (pdf). <http://www.hetwebsite.net/het/fonseca/notes/schoolsofthought.pdf>
- Foster J.B., Clark B., York R. (2010). The Ecological Rift: Capitalism's War on Earth. Monthly Review Press.
- Foster J.B. and Clark B. (2009, November 1). The Paradox of Wealth: Capitalism and Ecological Destruction. Monthly Review. <https://monthlyreview.org/2009/11/01/the-paradox-of-wealth-capitalism-and-ecological-destruction/>
- Fullbrook E. (2002). [Introduction: Broadband Versus Narrowband Economics](#), published at [www.PAEcon.net](http://www.PAEcon.net)
- Fullbrook E. (2005). [The Rand Portcullis and PAE](#), published at [www.PAEcon.net](http://www.PAEcon.net)
- Fullbrook E. (2019). [Economics 101: Dog barking, overgrazing and ecological collapse](#), in [Economics and the Ecosystem](#) edited by E. Fullbrook and J. Morgan
- Fullbrook E. (editor). (2004). A Guide to What's Wrong with Economics. Anthem Press.
- Fullbrook E. (editor). (2007). Real World Economics. Anthem Press.
- Fullbrook and Morgen (editors). (2019). Economics and the Ecosystem. World Economics Association. <http://www.paecon.net/PAEReview/issue87/whole87.pdf>
- Fullbrook E. (2019). Economics 101: Dog barking, overgrazing and ecological collapse. PAEcon. <http://www.paecon.net/PAEReview/issue87/Fullbrook87.pdf>
- Gadrey J. (2002). Is the Concept of Economic Growth Autistic? published at [www.PAEcon.net](http://www.PAEcon.net). <http://www.paecon.net/PAEtexts/Gadrey1.htm>

Gadrey J. (2004). What's wrong with GDP and growth? The Need for Alternative Indicators, in A Guide to What's Wrong with Economics edited by E. Fullbrook (→ [google reader](#)). Wimbledon Publishing Company.

Gerber J.F. (2016). The Legacy of K. William Kapp. Wiley Online Library.  
<https://onlinelibrary.wiley.com/doi/pdf/10.1111/dech.12238>

Gershon L. (2018). Ecological Economics: An Oxymoron?  
<https://daily.jstor.org/ecological-economics-an-oxymoron/> (an article about the ideas of economist Clive L. Spash)

Gillam C. (2018, June 26). Whitewash: The story of a weed killer, cancer, and the corruption of science [video]. YouTube. <https://www.youtube.com/watch?v=lqFSQ-HPdSI> (Carey Gillam, journalist, author of Whitewash; the influence of powerful corporations on scientists, “I found it most shocking, how easily universities and academics can be purchased for a variety of deception tactics”)

Gillies D. (2012). “The Use of Mathematics in Physics and Economics”, in Probabilities, Laws and Structures, Springer, 2012, pp. 351-362

Gingras Y. (2002). Beautiful Mind, Ugly Deception: The Bank of Sweden Prize in Economics Science, published at [www.PAEcon.net](http://www.paecon.net)  
<http://www.paecon.net/PAEReview/issue17/Gingras17.htm>

Goodwin N. (2019). “Addressing meta-externalities: investments in restoring the Earth”, published at [www.PAEcon.net](http://www.paecon.net), also in [Economics and the Ecosystem](#) edited by E. Fullbrook & J. Morgan.  
<http://www.paecon.net/PAEReview/issue87/Goodwin87.pdf>

Gorre V. & M. (2019, August 12). Green Is the New Red: The Metamorphosis of Communism. The American Society for the Defence of Tradition, Family and Property.  
<https://www.tfp.org/green-is-the-new-red-the-metamorphosis-of-communism/>

Graupe S. (2019). Keynote von Prof. Dr. Silja Graupe (Cusanus Hochschule) an der Tagung "Auf zu neuen Ufern" [video]. YouTube. <https://www.youtube.com/watch?v=vKpr80mHnoY>

Green T.L. (2013). Teaching (un)sustainability? University sustainability commitments and student experiences of introductory economics. Ecological Economics 94 (2013) 135–142.

Greer J.M. (2011). The Wealth of Nature. New Society Publishers.

Guerrien B. (2004). “A Science Too Human? Economics, in Real World Economics” edited by E. Fullbrook. <http://www.paecon.net/PAEReview/issue24/Guerrien24.htm>

Hardin G. (2008, February 19). Garrett Hardin on the Tragedy of the Commons [video]. YouTube. <https://www.youtube.com/watch?v=g8yOamWq3a0>

Harvey D. (2005). A Brief History of Neoliberalism. Oxford University Press.

Hemenway T. (2009). Gaia's Garden: A Guide to Home-Scale Permaculture. Chelsea Green Publishing.

Hickel J. (2020). Less is More: How Degrowth Will Save the World. Cornerstone Digital.

Hickel J. (2019). “Degrowth: a theory of radical abundance” in [Economics and the Ecosystem](#) edited by E. Fullbrook and J. Morgan. <http://www.paecon.net/PAEReview/issue87/Hickel87.pdf>

Hodgson G.M. (2004). “On the Problem of Formalism in Economics”, published at [www.PAEcon.net](http://www.paecon.net/PAEReview/issue28/Hodgson28.htm)  
<http://www.paecon.net/PAEReview/issue28/Hodgson28.htm>

Howard A. (1947). *The Soil and Health: A Study of Organic Agriculture*. University Press of Kentucky.

Howard A. (1950). *The Agricultural Testament*. Oxford University Press.

Hudson J. (2017, November 29). *The History of Neoliberal Economics - Renegade Podcast interview* [video]. YouTube. <https://www.youtube.com/watch?v=iZzH8xxCzR0> (→ [transcript of this interview: Michael Hudson’s “TED TALK” on Economics](#))

Hudson J. (2017). *J is for Junk Economics: A Guide to Reality in an Age of Deception*. ISLET-Verlag.

Hudson J. (2018, April 2). *Michael Hudson explains Junk economics - FULL INTERVIEW* [video]. YouTube. [https://www.youtube.com/watch?v=LE65\\_r18k-w&feature=youtu.be](https://www.youtube.com/watch?v=LE65_r18k-w&feature=youtu.be) (economists as “useful idiots” at 23:55)

Hunt E.K. & Lautzenheiser M. (2011). *History of Economic Thought*, 3rd edition. Routledge.

ISIPE (2014). *Open Letter*. International Student Initiative for Pluralism in Economics (ISIPE).  
<http://www.isipe.net/open-letter>

Jacke D. & Toensmeier E. (2005). *Edible Forest Gardens, Vol. 1: Ecological Vision and Theory for Temperate Climate Permaculture*. Chelsea Green Publishing.

Jones, Pennington, Skidelsky. (2013). *Masters of the Universe: Hayek, Friedman, and the Birth of Neoliberal Politics* [video]. YouTube. [https://www.youtube.com/watch?v=ehrp2\\_ffPc](https://www.youtube.com/watch?v=ehrp2_ffPc)

Jones D. S. (2012). *Masters of the Universe: Hayek, Friedman, and the Birth of Neoliberal Politics*. Princeton University Press.

Keen S. (2011). *Debunking Economics*. Zed Books.

Keen S. (2018). *How Economics Became a Cult* [video]. YouTube.  
<https://www.youtube.com/watch?v=JepIRmADW3E>

Kenton W. (2019, August 4). *What is Political Economy?* Investopedia.  
<https://www.investopedia.com/terms/p/political-economy.asp>

Kimmerer R. W. (2015). *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants*. Milkweed Editions.

Kimmerer R.W. (2017). *The Teachings of Plants: Finding Common Ground Between Traditional and Scientific Knowledge* [video]. YouTube.  
[https://www.youtube.com/watch?time\\_continue=2144&v=ZAH\\_pqVMZ0Q](https://www.youtube.com/watch?time_continue=2144&v=ZAH_pqVMZ0Q) (at 35:40 in video, unsurprising outcome of industrial lifestyle and education: Children who can recognize more than 100 company logos, can hardly recognize 10 plant species. Industrial lifestyle and education...)

Kirman A. (2019, August 14). *Why We Need a Multidisciplinary Economics* [video]. YouTube.  
<https://www.youtube.com/watch?v=HYucuJJY7EQ>

Klein N. (2019). *On Fire: The Burning Case for a Green New Deal*. Allen Lane.

Koerth M. (2016, October 7). The Economics Nobel Isn't Really a Nobel. FiveThirtyEight.  
<https://fivethirtyeight.com/features/the-economics-nobel-isnt-really-a-nobel/>

Kopp T. et al. (2017). Auf Kosten anderer? Wie die imperiale Lebensweise ein gutes Leben für alle verhindert. Oekom Verlag. Download e-book: <https://aufkostenanderer.org/download-dossier/>  
(In English: At the cost of others? How the imperial lifestyle prevents a good life for all)

Kumar S. (2013, February 12). Education With Hands, Hearts and Heads: Satish Kumar at TEDxWhitechapel [video]. YouTube. <https://www.youtube.com/watch?v=VAz0bOtfVfE> (Satish Kumar asks, why doesn't London School of Economics have an ecology department?)

Kütükcüoğlu T. (2019, May 5). Ecosystem Mutilation and Patching Business.  
<https://www.tuncalik.com/2019/05/ecosystem-mutilation-business/>

Kütükcüoğlu T. (2019, August 1). What is Industrial Paradigm? Industrial versus Ecological Paradigm. <https://www.tuncalik.com/2019/08/what-is-industrial-paradigm/>

Kütükcüoğlu T. (2020, July 23). Most Popular Myths of Mainstream Economics.  
<https://www.tuncalik.com/2020/07/most-popular-myths-of-mainstream-economics/>

Kütükcüoğlu T. (2020, August 8). Economics or Anthropology?  
<https://www.tuncalik.com/2020/08/economics-or-anthropology/>

Kütükcüoğlu T. (2020, August 17). 5 Essential Questions for all Departments of Economics.  
<https://www.tuncalik.com/2020/08/5-essential-questions-for-economics-departments/>

Lasch C. (1991). The True and Only Heaven: progress and its critics. W.W. Norton & Company.

Lasch C. (1995). The Revolt of the Elites and the Betrayal of Democracy. W. W. Norton & Company.

Lawson T. Professor Tony Lawson on Economics & Social Ontology (interview) [video].  
<http://www.economicsppf.com/tony-lawson.html>

Living Anthropologically. Worst Mistake in the History of the Human Race (Jared Diamond).  
<https://www.livinganthropologically.com/archaeology/agriculture-worst-mistake/>

Mankiw G. (2015). Principles of Economics (7<sup>th</sup> Edition). Cengage Learning.

Manning R. (2004). Against the Grain: How Agriculture Has Hijacked Civilization. North Point Press.

Manning R. (2014). Richard Manning – Interview [video]. YouTube.  
<https://www.youtube.com/watch?v=Zdr-maH3jtc> (Green Revolution, primary production, famine, cage of civilization, catastrophic agriculture, progress...)

Mazzucato M. (2018). The Value of Everything. Penguin Books.

Mazzucato M. (2018, July 10). Mariana Mazzucato: The Value of Everything - making and taking in the global economy [video]. YouTube. <https://www.youtube.com/watch?v=ZUQgvhxMQOQ>

McManners P. (2019). "Victim of success: civilisation is at risk", published at [www.PAEcon.net](http://www.PAEcon.net), in [Economics and the Ecosystem](http://www.paecon.net/PAEReview/issue87/McManners87.pdf) edited by Fullbrook & Morgan.  
<http://www.paecon.net/PAEReview/issue87/McManners87.pdf>



Merchant C. (1990). *The Death of Nature*. HarperCollins.

Monbiot G. (2014, May 7). *The Pricing of Everything* [video]. YouTube.

<https://www.youtube.com/watch?v=ni1tX0bpTR8>

Morgen J., Fullbrook E. (2019). "Introduction: Economics and civilization in ecological crisis", published at [www.PAEcon.net](http://www.PAEcon.net), in *Economics and the Ecosystem* edited by E. Fullbrook & J. Morgan <http://www.paecon.net/PAEReview/issue87/MorganFullbrook87.pdf>

Nelson E. (2018, December 15). *The re-education of Economics 101*. <https://qz.com/1486238/the-unlikely-reeducation-of-econ-101/> (CORE project's new curriculum, economics education in UK)

Norgaard R, 2019. *Economism and the Econocene: a coevolutionary interpretation*. Economics and the Ecosystem. <http://www.paecon.net/PAEReview/issue87/Norgaard87.pdf>

OIKOS, (2019, . Mapping Pluralist Research Reports.

<https://oikos-international.org/news/mapping-pluralist-research-report-published/>

(An overview report of the current situation, with links to many research reports about economics education in Europe, including cases from UK, Germany and France)

Oreskes N. and Conway E. (2011). *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Climate Change*. Bloomsbury Publishing.

Oreskes N. and Conway E. (2014). *The Collapse of Western Civilization: A View from the Future*. Columbia University Press.

Organic Without Boundaries. (2018, September 12). *How Organic Agriculture Helps Mitigate Climate Change*. <https://www.organicwithoutboundaries.bio/2018/09/12/climate-change-mitigation/>

Ostrom E. (2009, April 3). *Sustainable development and the tragedy of commons* [video]. YouTube. <https://www.youtube.com/watch?v=ByXM47Ri1Kc>

Ostrom E. (2011, June 28). *Elinor Ostrom on managing "common pool" resources* [video]. YouTube. <https://www.youtube.com/watch?v=D1xwV2UDPAg>

Peil J. and Staveren I. (2011). *Handbook of Economics and Ethics*. Edward Elgar Publishing Inc.

PEPS-Economie. (2014). *The case for pluralism: what French undergraduate economics teaching is all about and how it can be improved*. *Int. J. Pluralism and Economics Education*, Vol. 5, No. 4, 2014. <https://drive.google.com/file/d/1rbWi1BZvJZip71r0g1wGG3QgxCWf5MGI/view>

Pollan M. (2006). *The Omnivore's Dilemma*. Bloomsbury Publishing.

Pollan M. (2010, January 8). *Michael Pollan: The Omnivore's Dilemma* [video]. YouTube. <https://www.youtube.com/watch?v=AEUxk12U9ZQ>

Pollan M. (2013). *How Cooking Can Change Your Life* [video]. YouTube.

<https://www.youtube.com/watch?v=TX7kwfE3cJQ&feature=youtu.be&t=948> (at 15.48 in video: "We recoil at social engineering by the government, but for some reason, we accept it by the industry")

Ponting C. (2007). *A New Green History of the World: The Environment and the Collapse of Great Civilisations*. Vintage Originals.

Raworth K, 2014. *Why it's time for 'Doughnut Economics'* [video]. YouTube.

<https://www.youtube.com/watch?v=1BHOfIzxPjI> (TEDx Talks, K. Raworth debunks GDP flow diagram of neoclassical macro-economics)

Raworth K. (2017). Doughnut Economics. Chelsea Green Publishing.

Raworth K, 2018. A healthy economy should be designed to thrive, not grow [video]. YouTube. <https://www.youtube.com/watch?v=Rhcrbcg8HBw> (TED talk, K. Raworth explains the ideological foundations of the concept of economic growth)

Reardon J. (2007). How green are principles texts? Int. J. Green Economics, Vol. 1, Nos. 3/4, 2007.

Rees W.E. (2019). “End game: the economy as eco-catastrophe and what needs to change”, in [Economics and the Ecosystem](#) edited by Fullbrook and Morgan. <http://www.paecon.net/PAEReview/issue87/Rees87.pdf>

Sapolsky R. (2011). Chaos and Reductionism [video]. YouTube. <https://www.youtube.com/watch?v=njf8jwEGRo&feature=youtu.be&t=1180> (at 19:40 in video, Sapolsky lecture, where westernized reductionism begins to fail: Complex biological systems)

Schumacher E.F. (1973). Small is Beautiful. First Harper Perennial.

Scott J.C. (1999). Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed. Yale University Press.

Scott E.C. (2004). Evolution vs. Creationism. University of California Press.

Scott J.C. (2017). Against the Grain. Yale University Press.

Shiva V. (2005). Earth Democracy. North Atlantic Books.

Shiva V. (2011). The lunacy of economic growth [video]. YouTube. <https://www.youtube.com/watch?v=IQzD6aEay4> (mechanistic and reductionist worldview of mainstream economics)

Shiva, V. (2011, December 12). Earth Democracy and the Rights of Mother Earth. <https://www.tikkun.org/earth-democracy-and-the-rights-of-mother-earth>

Shive, V. (2012, September 24). TEDxMasala - Dr Vandana Shiva - Solutions to the food and ecological crisis facing us today [video]. YouTube. <https://www.youtube.com/watch?v=ER5ZZk5atIE>

Shiva V. (2013). Making Peace with the Earth. Pluto Press.

Shiva V. (2013, November 10). Festival of Dangerous Ideas 2013: Growth = Poverty [video]. YouTube. <https://www.youtube.com/watch?v=7M3WJQbnHKc>

Shiva V. (2013, April 20). Making Peace with the Earth and Ending Our Separation from It — Vandana Shiva [video]. YouTube. <https://www.youtube.com/watch?v=u5ZorsMKNNNo&feature=youtu.be&t=2756> (at 45:56)

Shiva, V. (2014, February 2020). Earth at Risk Conference 2014 [video]. YouTube. [https://www.youtube.com/watch?v=0ZY\\_XuziJfE&feature=youtu.be&t=470](https://www.youtube.com/watch?v=0ZY_XuziJfE&feature=youtu.be&t=470) (at 7:50 in video)

Shiva, V. (2014, July 10). Vandana Shiva: Rethinking Development in the 21st Century [video]. YouTube. [https://www.youtube.com/watch?v=8lz8SIRGu\\_A](https://www.youtube.com/watch?v=8lz8SIRGu_A)

Shiva V, 2015. Earth Democracy with Vandana Shiva [video]. YouTube. <https://www.youtube.com/watch?v=ePCqDOLUTvU&feature=youtu.be&t=330> (at 5:30 in video, “The will to control, and the will to profit was embodied in what was defined as progress”, first one of the five grand delusions: We are not part of the nature, Francis Bacon's masculine civilization)

Shiva, V. (2016). Who Really Feeds the World? The Failures of Agribusiness and the Promise of Agroecology. North Atlantic Books.

Shiva V. (2019). Oneness vs the 1%: Shattering Illusions, Seeding Freedom. New Internationalist.

Shiva, V. (2019, June 5). Oikonomia: Bringing the economy back to the Earth. Navdanya. <https://www.navdanya.org/bija-reflections/2019/06/05/oikonomia-bringing-the-economy-back-to-the-earth-dr-vandana-shiva/>

Shiva V. (2019, June 13). Towards a Healthy Planet, Healthy People; Poison Free Food & Farming [video]. YouTube. <https://www.youtube.com/watch?v=PXsiR4dzzM0> (“The biggest harm to the earth's ecosystem and climate is caused by industrial farming.”)

Shiva V. (2020, March 25). Ecofeminism and the decolonization of women, nature and the future [video]. YouTube. <https://www.youtube.com/watch?v=hVbboV9Rfjg>

Siler, K. (2003). The Social and Intellectual Organization and Construction of Economics. Real World Economics edited by E. Fullbrook. <http://www.paecon.net/PAEReview/issue22/Siler22.htm>

Skidelsky, R. (2019). What Is Economics About? | How & How NOT to Do Economics with Robert Skidelsky [video]. YouTube. <https://www.youtube.com/watch?v=dZQLHLFKock> (why learning history and philosophy of economic is essential)

Söderbaum, P. (2004). The Nobel Prize in Economics: barrier for new thinking. A Guide to What's Wrong with Economics edited by E. Fullbrook. <http://www.paecon.net/PAEReview/issue28/Soderbaum28.htm>

Söderbaum P. (2019). Toward sustainable development: from neoclassical monopoly to democracy-oriented economics. [Economics and the Ecosystem](#) edited by Fullbrook and Morgan. <http://www.paecon.net/PAEReview/issue87/Soderbaum87.pdf>

Spash C.L. (2011). [Understanding the Past to See the Future](#). American Journal of Economics and Sociology, vol. 70 no. 2 pp. 340-375.

Spash C.L. and Smith T. (2019). Of ecosystems and economies: re-connecting economics with reality. [Economics and the Ecosystem](#) edited by Fullbrook and Morgan. <http://www.paecon.net/PAEReview/issue87/SpashSmith87.pdf>

Stiglitz J. (2019). Joseph Stiglitz: Rewriting the Rules of the European Economy. <https://www.youtube.com/watch?v=ZS0ipOVGVII> (an example of good looking, respectable and harmless, non-blasphemous criticism which is quite tolerable within the establishment of mainstream)

Studie EconPLUS. PluraloWatch. <https://www.pluralowatch.de/econplus/zusammenfassung-und-download/> (Pluralism in the economics curriculum in Germany)

Sutton A. (2018, May 13). False Cleanerfish – Facts and Photographs. Seaunseen. <https://seaunseen.com/false-cleanerfish/>

Suzuki D. (2012, January 7). David Suzuki: An elder's vision for our sustainable future [video]. YouTube. <https://www.youtube.com/watch?v=S2b7SpLpN5A&feature=youtu.be&t=2760> (at 46:00, “we always ask nature to fit our flawed economic systems, and it just won't work”)

Suzuki D. (2013, May 6). Time is Running Out: Ecology or Economics? [video]. YouTube. <https://www.youtube.com/watch?v=5wtUMM8SDws> (David Suzuki at Western Washington University: “Our small successes in the conservation of life were only temporary because we couldn't change the established mentality.”)

Suzuki D., Oreskes N., Flannery T. (2016, March 10). David Suzuki, Naomi Oreskes and Tim Flannery - For Thought: Hope for the Planet [video]. YouTube. <https://www.youtube.com/watch?v=VwEET1mV2eo&feature=youtu.be&t=2117> (Suzuki: “First of all, economics is not a science; it is a set of beliefs posing as a science” at 35:17)

Vaulry O. (2003). Is GDP a good measure of economic progress? Real World Economics edited by E. Fullbrook. <http://www.paecon.net/PAEReview/issue20/Vaury20.htm>

Warburton N. (2012). “The man who asked no questions” (Adolf Eichmann). A Little History of Philosophy. Yale University Press.

Walstad D. (2013). Ecology of the Planted Aquarium, 3rd edition. Echinodorus Publishing.

Weatherford J. (2010). Indian Givers: How Native Americans Transformed the World. Three Rivers Press.

Wikipedia. Nicholas Georgescu-Roegen (1906-1994). [https://en.wikipedia.org/wiki/Nicholas\\_Georgescu-Roegen](https://en.wikipedia.org/wiki/Nicholas_Georgescu-Roegen) (“Neoclassical economists left nature out of their calculus because the 'no deposit, no return' analogue befits the business men's view of economic life.”)

YaleCourses (2008). The Sovereign State: Hobbes' Leviathan [video]. YouTube. <https://www.youtube.com/watch?v=Y3S1uqgGfB4&t=1860s> (at 31:00 in video, “Hobbes' goal here was to liberate knowledge, liberate science, from dependence upon nature or chance, by turning science into a tool for remaking nature to fit our needs”)