EDUCATION - INCUBATOR FOR A SUSTAINABLE FUTURE

How can public education empower citizens for global sustainability?

NEPC SUMMER SCHOOL 2015
EVENT REPORT

1 INTRODUCTION OF THE TOPIC

I. Understanding of Sustainability Education and Global Policies – *Lana Jurko*

The understanding of Sustainability Education brings us back to the linguistic challenge of the *meaning as definition versus the meaning as perception.*
Going back to terminology *Sustainability Education (SE), Education for Sustainability (EfS) and Education for Sustainable Development (ESD) are interchangeable terms* describing the practice of teaching for Sustainability.

ESD is the term most used internationally and by United Nations. Agenda 21 (1992) was the first international document that identified education as an essential tool for achieving sustainable development and highlighted areas of action for education.

During the *UNESCO Decade of ESD* (2005-2014) the concept of ESD goes far beyond environmental education. ESD is defined as the educational process of achieving human development (*the three pillars of human development proposed by UNDP: economic growth, social development and environmental protection*) in an inclusive, equitable and secure manner. It thus includes education for poverty alleviation, human rights, gender equality, cultural diversity, international understanding, peace and many more. UNESCO proposed that *the vision of education for sustainable development is a world where everyone has the opportunity to benefit from quality education and learn the values, behaviour and lifestyles required for a sustainable future and for positive societal transformation.*

The 2014 UNESCO World Conference on Education for Sustainable Development (ESD) in Japan marked the end of the UN Decade of ESD (2005-2014) and the beginning of Global Action Programme (GAP) on ESD.

The Global Action Programme (GAP) on ESD seeks to generate and scale-up ESD action. It is intended to make a substantial contribution to the post-2015 agenda. The overall goal of the GAP is to generate and scale up action in all levels and areas of education and learning to accelerate progress towards sustainable development.

GAP focuses on five priority action areas:

Advancing Policy | Integrating sustainability practices into education and training environments (whole-institution approaches) | Increasing the capacity of educators and trainers | Empowering and mobilizing youth | Encouraging local communities and municipal authorities to develop community-based ESD programmes.

The Sustainability Education is also incorporated in the UN Secretary General's Global Initiative on Education – *Global Education First Initiative.*

The Initiative's main priorities are to expand access to education, improve the quality of learning, and foster global citizenship.

Priority 1: Put Every Child in School
Priority 2: Improve the Quality of Learning
Priority 3: Foster Global Citizenship:
The world faces global challenges, which require global solutions. These interconnected global challenges call for far-reaching changes in how we think and act for the dignity of fellow human beings.
It is not enough for education to produce individuals who can read, write and count.
Education must be transformative and bring shared values to life. It must cultivate an active care for the world and for those with whom we share it.
Education must also be relevant in answering the big questions of the day. Technological solutions, political regulation or financial instruments alone cannot achieve sustainable development. It requires transforming the way people think and act. Education must fully assume its central role in helping people to forge more just, peaceful, tolerant and inclusive societies. It must give people the understanding, skills and values they need to cooperate in resolving the interconnected challenges of the 21st Century.

Education for All (EFA) and the Millennium Development Goals (MDGs) are political commitments in the field of education, the goals set in EFA and MDGs will not be achieved by 2015 (the deadline) and the Post-2015 agenda aims to define the new framework for the goals.

Incheon Declaration –
Education 2030: Towards inclusive and equitable quality education and lifelong learning for all
Despite focused effort and the progress made with EFA and MDG the global policy makers led by UNICEF acknowledging that the 2015 goals have not been fully achieved and proposed new 2030 education agenda. The declaration outlines the new vision and was adopted in Incheon in May 2015. Declaration is captured in the United Nations Sustainable Development Goal 4 "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all"
For the first time there is a specific and clear education goal as SD and making quality education an indicator for achieving sustainability.

II. Thinking Global, Educating local: Environmental and Sustainability Education in International and Comparative Perspectives – *Oren Pizmony-Levy*
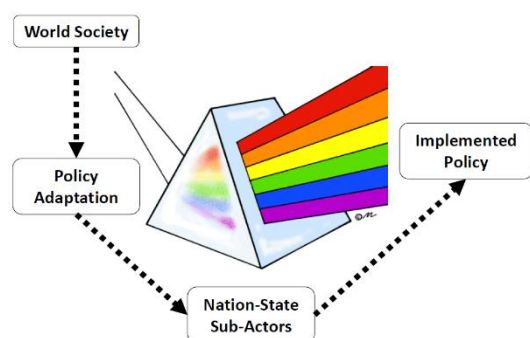
The twentieth century has been characterized by the immense growth in international and national activities to protect the natural environment. Environmental education has been introduced in primary and secondary schools.

Environmental education is considered to be more than the transmission of knowledge and foresees the objective of raising environmental awareness using a multidisciplinary approach. Environmental education is often a challenge for schools and the role of NGOs and Environmental Education organizations has been crucial in helping schools. In order to understand the role of Environmental Education organizations (EEO) and development of Environmental Education we refer to the following theoretical framework explaining the process of educational globalization.

The optic prism describes how the global script developed by the world society is differently interpreted by Nation-states and resulted in various policy implementations.

NGOs have crucial role in policy adaptation.

Considering the metaphor of the optic prism and analysing the development of environmental education we can see how environmental education discourse developed through a series of international meetings (world society): this discourse and what counts as environmental education have changed over time.

In the development of Environmental Education discourse, we distinguish two waves:

→ The first wave emerges in 1970s – 1980s - several international events (International Workshop on Environmental Education (UNESCO/UNEP 1975, Belgrade), the Intergovernmental Conference on Environmental Education (UNESCO/UNEP 1977a, Tbilisi), and the International Congress for International Strategy for Action in Environmental Education for the 1990s (UNESCO/UNEP 1987, Moscow)) aim to enable country the introduction of EE in their curricula.

In 1970, the International Union for the Conservation of Nature published founding definitions for what counts as EE. Drawing on this work, international organizations (e.g., UNESCO, UNEP [United Nations Environmental Program]) developed a formal definition of EE, which stated that it includes teaching about the environment (knowledge), teaching in the environment (process/pedagogy), and teaching to care for the environment (awareness, attitudes, skills, and participation).

→ The second wave emerges in 1990s – 2000s – in this phase the EE is positioned in the wider concept of Education for Sustainable Development (ESD). The milestones of the

development of this discourse are: UN Conference on Environment and Development (Rio de Janerio 1992), Thessaloniki 1997, World Summit on Sustainable Development (Johannesburg 2002), Ahmedabad 2007, and United Nations Conference on Sustainable Development (Rio de Janerio 2012).

How EE is positioned in ESD is visible through the definitions:

"**Environmental education** is aimed at producing a citizenry that is knowledgeable concerning the bio-physical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution" (Stapp et. al 1969)	"**Education for sustainable development** aims to help people to develop the attitudes, skills, perspectives and knowledge to make informed decisions and act upon them for the benefit of themselves and others, now and in the future. ESD helps the citizens of the world to learn their way to a more sustainable future" (UNESCO).

Environmental and Sustainability Education (ESE) represents a fundamental challenge for education and schools because:
- *It is more than the sheer transmission of knowledge*
- *does not resonate with the cultural landscape of modern schooling*
- *does not fit the common disciplinary boundaries, it is multidisciplinary and interdisciplinary*
- *does not fit the common practice of teaching in class*
- *emphasizes issues that transcend national borders and associates with world citizenship, thus counter the nation state narrative*

In line with 'the waves' described above and within the explained theoretical framework, the environmental coverage in textbooks increased in the last 4 decades. In line with the international discourse on environmental education the number of EEOs increased more in the first wave than in the second and more in industrialized countries than in non-industrialized countries.

In ESE, we can identify two modes of implementation:

- *Creation of a single subject in which knowledge is organized in an interdisciplinary fashion (diffusion)*
- *Integration of EE through the curriculum in a multidisciplinary fashion (infusion)*

How do schools worldwide vary in their engagement with the global ESE script and its modes of implementation – diffusion and infusion?

How does modes implementation matter for student environmental knowledge and attitudes toward environmental and sustainability issues?

In most cases the environmental topics sit in sciences courses. Analysing the effect of environmental education in environmental optimism, environmental awareness and environmental learning we observe how environmental education actually has almost no effect on environmental optimism and awareness and a larger positive effect can be seen on environmental learning.

In order to see if any correlation exists between the students' knowledge and their attitudes towards environmental citizenship, the Trends in International Mathematics and Science Study (TIMSS 1999) AND international Civic Education Study (CIVED 1999) have been analysed.

The Correlation between Achievements in Environmental Science and Life Science show how the high level of achievements in Environmental Sciences corresponds to high level of achievements in Life Science. *The correlation between Achievements in Environmental Science and Environmental Citizenship shows that countries that excel in teaching about environment not always excel in teaching for environment – an high level of students' knowledge about environment does not increase the environmental citizenship e.g. participation in EEO.*
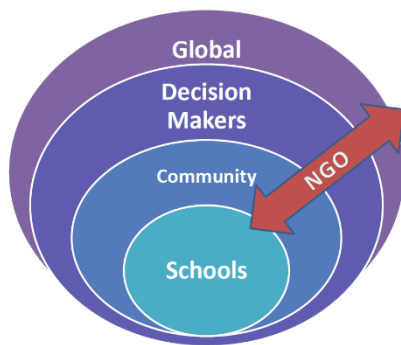
Considering the challenges of EE in schools enumerated above and that knowledge about environment provided in schools does not increase the environmental citizenship, NGOs are an important catalyst of ESE. NGOs, as part of the civil society, promote social change, create a space for activism and engage citizenship. Therefore, they (can) play the important role of receptor and translator of global scripts in practices.

2 THEORETICAL FRAMEWORK

I. (Social constraints) How far for the money? Prosperity and democratic degrowth potential – *Mladen Domazet*

We almost axiomatically assume in contemporary society that in any respect growth is better; growth means more goods, more services. The use of degrowth as opposite of growth is an attempt to decolonise our imaginary from the automatic association of better with more, by proposing imaginaries of a good life without fetishism of growth, and all because of understanding of the hidden side-effects and motives that come alongside growth.

Degrowth, as a provocative slogan, represents a critique of growth and indicates new directions in which the _reduction_ of use of natural resources and a _different_ structure of societies will be based on *sharing, simplicity, conviviality, care.*

The Degrowth conceptual framework can be approached through:

– *criticism of growth, as infinite growth is not possible in a finite world*

– *Criticism of capitalism and the associated growth imperative*

– *Criticism of GDP as a reductionist measure to capture all human interactions through monetary exchange, questioning the link utility – market exchange - social welfare*

– *Criticism of commodification that transforms natural resources into commodities with monetary value subjected to market forces and devoid of their broader meaning*

and advocates for (on the constructive side):

- *New forms of societies organization such as cooperatives and eco-communities*

- *Work-sharing and reduction of employment-time*

- *Basic minimum income*

- *Self-conscious limitation for a communal interest, a wisdom to know when 'enough' should overcome 'accumulation'*

The concept of degrowth, even if often associated with smaller, actually advocates for a different "better". Assuming that growth did not generate welfare, degrowth proposes differently structured societies with a smaller metabolism that serves new functions.

Even though such societies, with their smaller metabolism and different functions, will have reduced GDPs, this will not mean less social welfare – on the contrary: public sectors such as medical care and education will *flourish while dirty industries and financial sectors will be decreased.*

Degrowth attitudes - Europe

Potential for Degrowth Attitudes and Behaviours across 18 European Countries (Ančić, B., and Domazet, M. 2015. Potential for Degrowth Attitudes and Behaviours across 18 European Countries. Teorija in Praksa, 52(3), 456–475)

Degrowth, as a movement based on the criticism of growth and awareness of the environmental, social and economic limits-of-growth, represents the call to initiate a public debate to explore alternatives to the imperative of growth to avoid catastrophic scenarios and dirty growth.

The paper aims to explore the *degrowth potential in Europe* through the comparative analysis of the data of 18 countries participating in the ISSP module Environment, and fielded during 2009, 2010 and 2012. Findings show the existence of a common awareness of environmental limits throughout the sample, but *richer* (core) and *poorer* (semi-peripheral) states differently evaluate the potential to address these limits.

European Semi-periphery states mix both core and peripheral areas structures and are historically and geographically positioned in between. In this paper European Semi-periphery states are presented as a potential for sustainable change of the world-system.
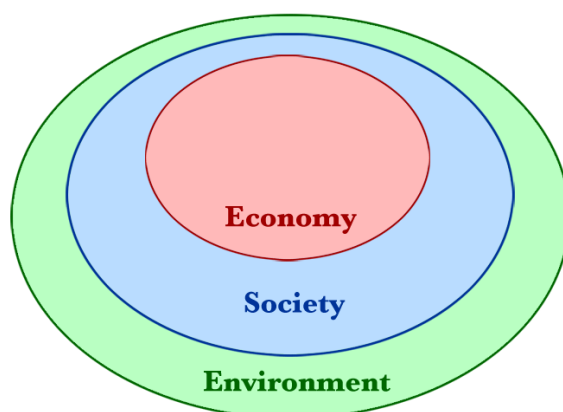
II. (Environmental constraints) The Tale of the Anthropocene: Choose your own Adventure – *Brannon Anderson*

To understand what we mean by environmental constraints to sustainability we need to define where the environment is positioned in the discourse about sustainability.
Historically sustainability has been presented as a construct with three pillars: environmental, social and economic. This model suggests that the three pillars are interchangeable and that the weakness of one pillar compromises the sustainability of the system. This model does not show (1) the interconnection between the pillars (2) the fact that the economy and society are subordinate to the environment.
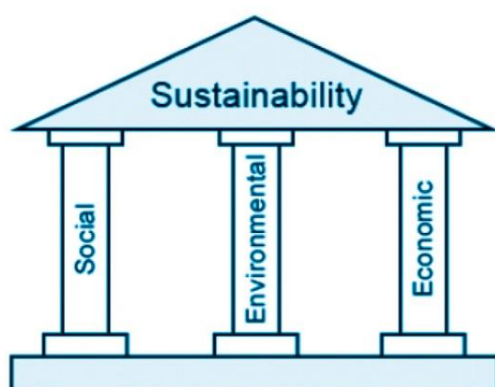
| Weak Sustainability | Strong Sustainability |

The Strong Sustainability representation shows how *the economy and society exist within the environmental sphere and human actions must respect the capacity of the ecosystem* (recognize environmental primacy). Farley and Smith 2013

It is evident after this short introduction how Sustainability Education is actually education for a *"Wicked Problem":*
→ *Every wicked problem is novel or unique*
→ *There is a no stopping rule; you can't hit the pause button*
→ *The problem is not understood until the formulation of the solution*
→ *Wicked problems are complex; they have no single cause, no single effect and have no given alternative solution*
→ *Every wicked solution is a 'one shot operation'; there is no off-the-peg 'best practice' answer. Solutions are not right or wrong, but they may be better or worse.*

http://www.bobwilliams.co.nz/wicked.pd

The understanding of the relation among the three components can also help us in understanding the Anthropocene:
*Anthropocene is human dominated world.*

According to the impact on the environment, we discern three socio-metabolic regimes: *hunter-gatherers, agrarian societies and industrial society.*

The hunter-gatherers metabolic regime is characterized by the passive use of solar energy while in agrarian and industrial society the *key of the system becomes the surplus*: the surplus of food in agrarian societies and the surplus of energy in the industrial society.
The constraints in the industrial socio-metabolic regime are represented by the global availability of resources and ability to assimilate wastes.
*All progress we have made since the hunter-gatherers regime is an illusion!*

In the last 25 years we can clearly see the consequences of the growing impact on the environment as the results of the Great Acceleration from the 1950s.
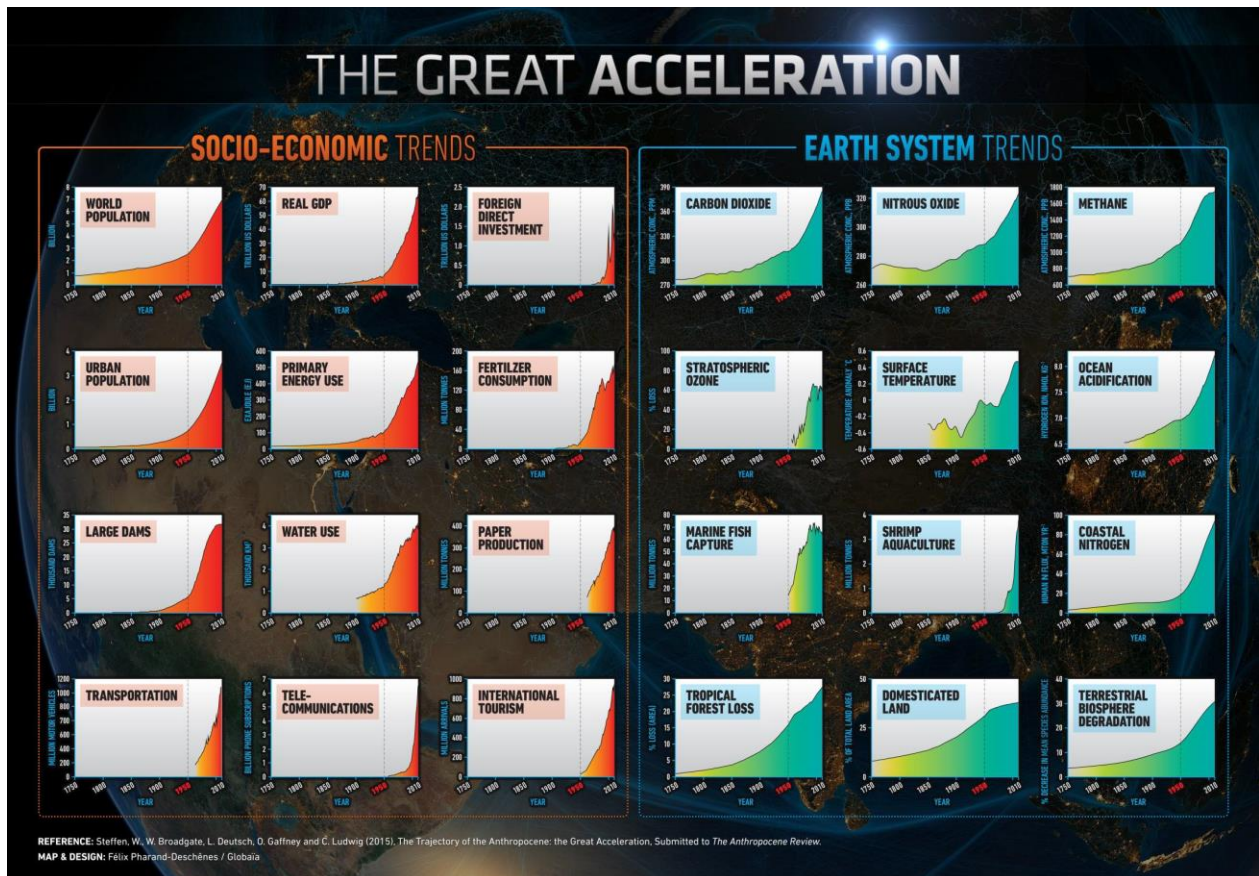
Steffen, W.W. Broadgate, L. Gaffrey and C.Ludwig (2015) The Trajectory of the Anthropocene: The Great Acceleration, Submitted to the Anthropocene Review

Considering the conceptualization of the strong sustainability founded on the recognition of the environmental primacy, the figure below shows how balance among the components lead to the urgent need of reconsidering the current system.
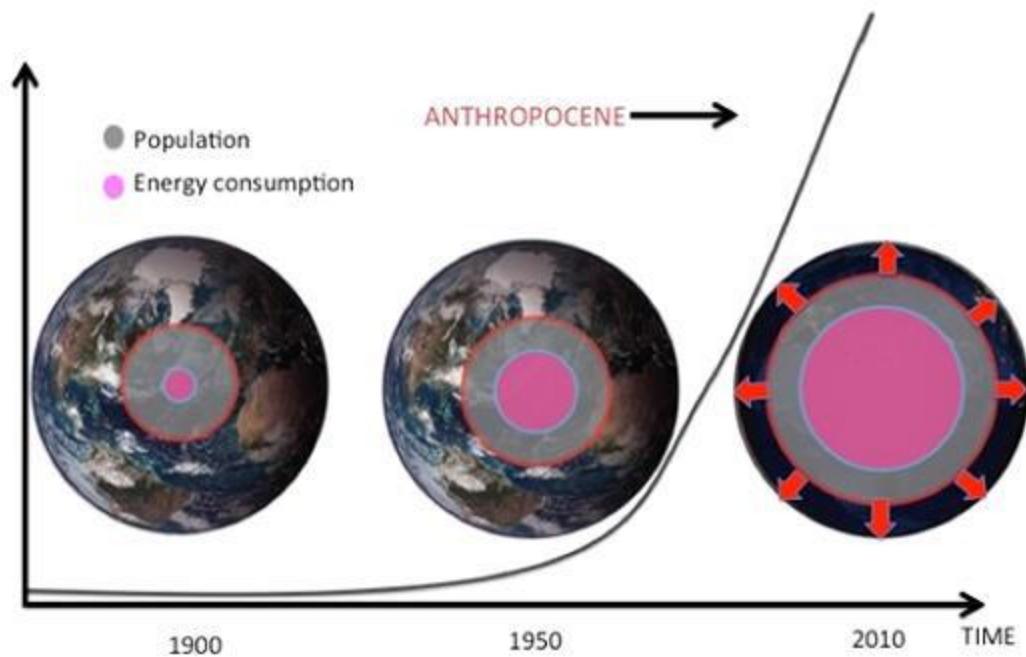
Griss et al. (2014)

The current system is actually based on consumerism and on the assumption 'We need what we want', the $ 16,000 per second spent in advertising make us buy stuff that we actually do not need.

The economic system is not in equilibrium with the planet and the prediction of infinite growth will cause the collapse: the consumption (in a prediction of 2% per year) leads the planet above the carrying capacity.

The infinite growth is (1) biophysically impossible in a finite planet. The infinite growth is also (2) socially unsustainable as 1% of world population controls the 46% of world wealth (Oxfam).
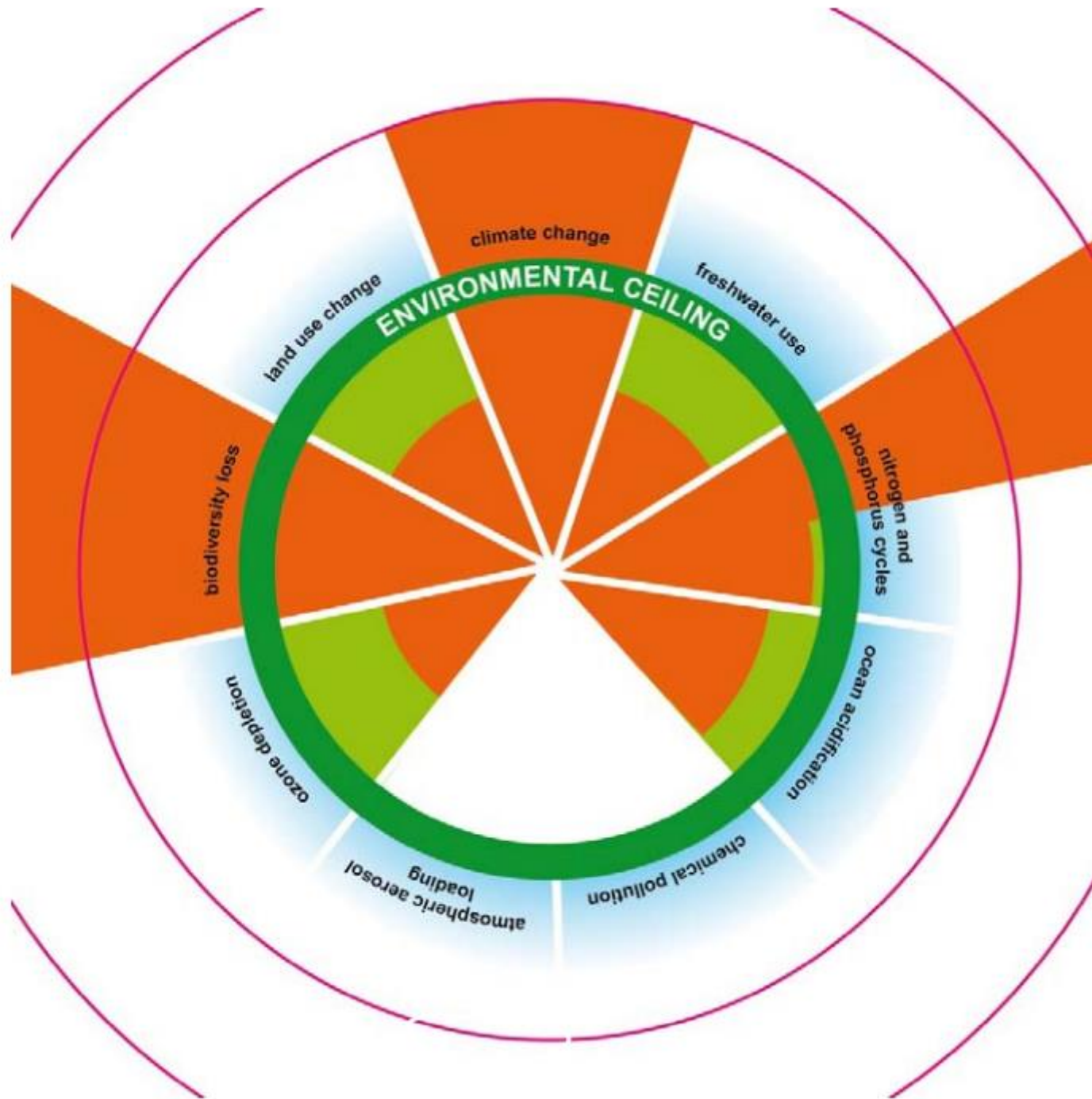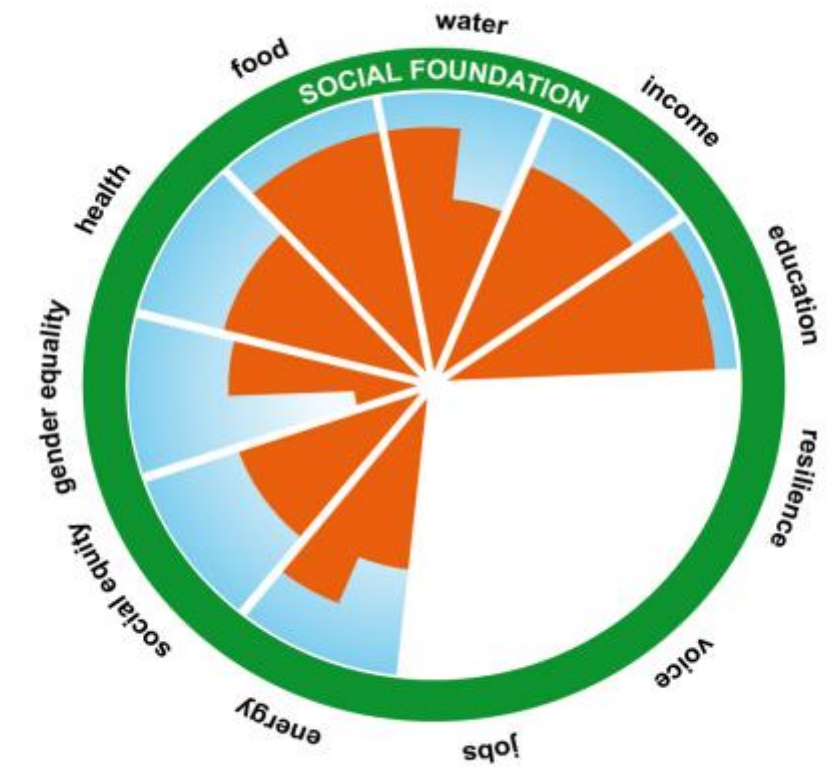
Figure 2. Falling below the social foundation: An illustrative assessment based on Rio+20 priorities

Source: Oxfam, _____. Social dimensions with two indicators in Table 1 are represented by split weages, showing both of the deprivation gaps.

Human rights provide the essential social foundation for all people to lead lives of dignity and opportunity. International human rights norms have long asserted the fundamental moral claim each person has to life's essentials – such as food, water, health care, education, freedom of expression, political participation, and personal security – no matter how much or how little money or power they have.

(1) The graph quantifies the environmental stress and indicates how close each Earth-system process is to the environmental ceiling: three out of nine Earth-system process have already been crossed.
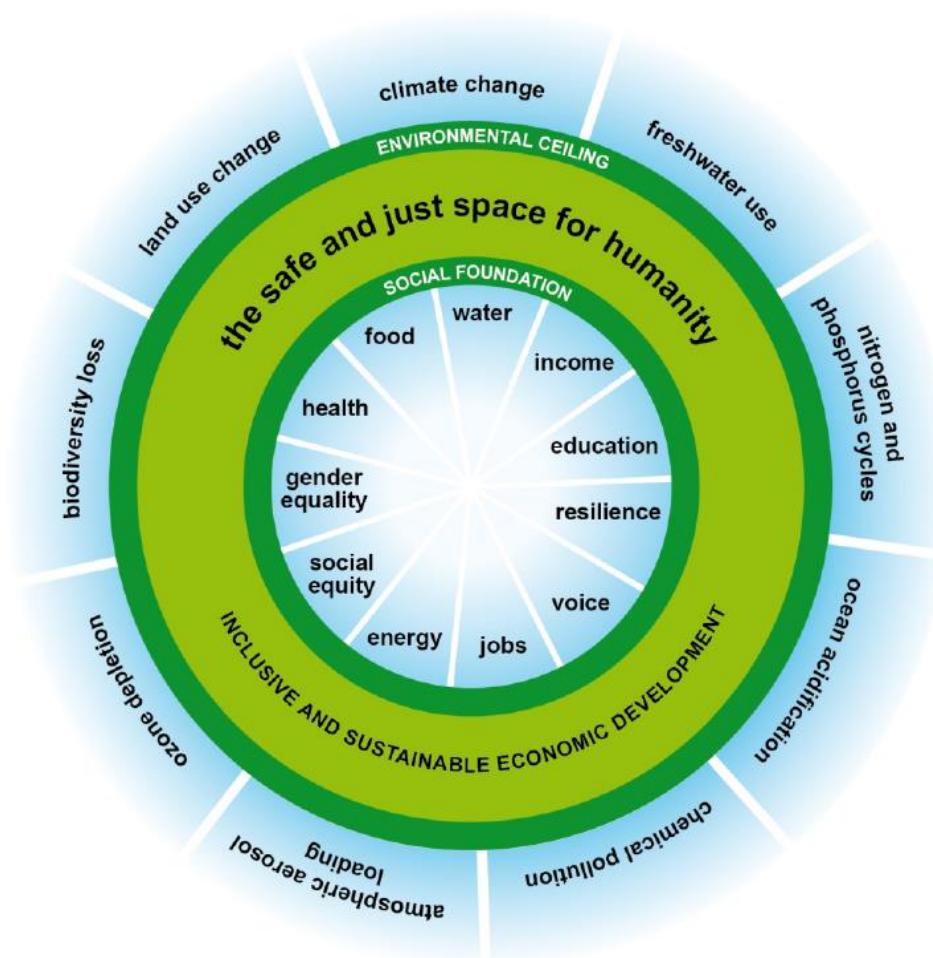
Raworth K., A safe and just space for humanity - CAN WE LIVE WITHIN THE DOUGHNUT? Oxfam 2012

The Illustration of Sustainability – combining the two aspects analysed in the figures above we can locate the space for the safe and just humanity above the essential of social foundation and below environmental ceilin

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We have described the consequences of the infinite growth on our planet and explained why infinite growth is actually not possible.

In the next step, we will analyse the alternatives to growth.

The **steady-state economy (SSE)** *is structured to aim for the improvement of the quality of living within the ecological limits. In this structure, the level of resource consumption needs to be maintained stably, adopting an efficient use of natural resources and fair wealth distribution.*

Considering SEE is about stability within ecological limits and that infinite growth led us above the ecological limits, to achieve SSE we first need the degrowth transition as the graph below shows.
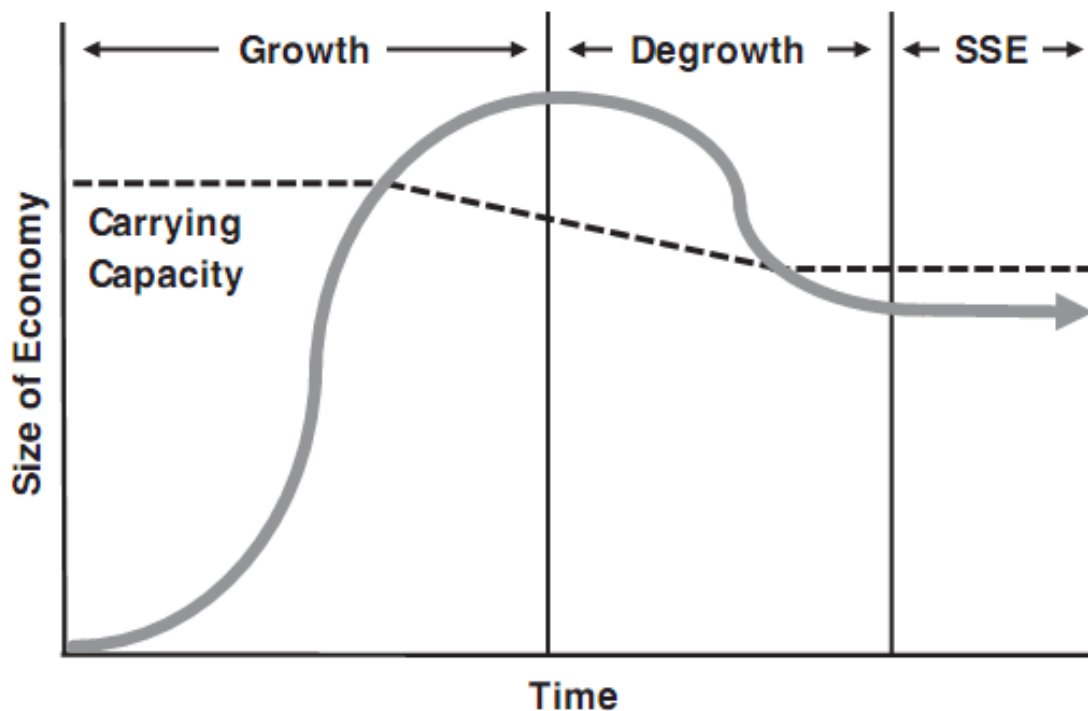
Fig. 1. The degrowth transition to a steady state economy. The figure illustrates the transition that wealthy nations must go through to arrive at a steady state economy (SSE). The figure also represents the overall global transition that must occur.

Therefore, infinite growth is actually impossible, we know why, we know its consequences, and we have an alternative economic model. Rationally speaking, considering the knowledge we have SSE should already be a reality! To understand why it is not we have to analyse our brain, our current economic model and future models.

Challenge #1 Humans
→ According to the Triune Brain Theory (Mac Lean, 1960) the brain consists of *Lizard Brain, Mammal Brain and Human Brain.* The Lizard Brain is hard-wired for short-term rewards generously guaranteed by our current fossil fuel driven economy.
   Varki and Bower (2013) affirm that there two characteristics of being human:
       o *Awareness of the thoughts of the others*
       o *Ability to deny reality*
The second might be fatal in the Anthropocene.

The human brain that confers us the ability for language, abstraction, perception and that simply said enhanced us to map the current situation could be neutralized by the ability to deny the reality!

→ (Rees, 2010) The evolution left humans with:
- ✓ A technology capacity to extract resources beyond regenerative capacity of Earth.
- ✓ No genetic 'off-switch' regarding the consumption that is triggered by sufficiency. (Psychologically committed to growth)
- ✓ Socio-cultural reinforcement of the growth paradigm

→ We are ultra social organism.

(Gowdy and Krall 2013) The ultra sociality is characterized by maladaptive evolutionary traits:
- ✓ Explosive population growth
- ✓ Complex division of labour
- ✓ Intensive resource exploitation
- ✓ Territorial expansion
- ✓ Social organization favouring survival and growth of super –group over the well-being of the individual

Challenge #2 Viable alternative to capitalism

Can Capitalism evolve into a Steady-State Economy?

| NO	YES
(Blauwhof 2012) "The twin goals of environmental sustainability and social justice, meeting the basic needs of people on this planet and keeping our economic system within planetary ecological limits, are necessarily incompatible under and because of the foundational social relations of capitalism. These social relations refer to the class division between capital and labour (of course with shades of grey in actual social groups) and market relations of exchange."	(Buch-Hansen, 2014) The nature of capitalism is defined by the institutional framework, based on a typology of different models of capitalism, some of them could enhance the de-growth transition that lead to SSE.

Challenge #3 No models of Sustainability

The discourse about Sustainability has become the discourse about everything, representing what is good in the society development. The biggest risk is that if sustainability is "everything" it can become an empty phrase and lose its relevance.
The complexity actually contributes to confused solutions without clear guidance for policy making.
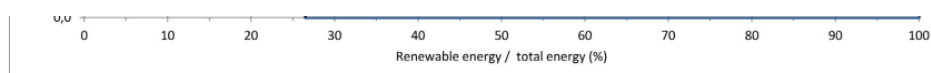
Environmentally sustainable but…

Currently, 38 countries are in the sustainable development space on dimensions 1 (ecological footprint) and 4 (renewable energy)(Fig. 3). The regression line in Fig. 3 indicates that countries having a high proportion of renewable energy in their energy production have lower ecological footprints than do countries having a low proportion of renewable energy. This finding might not come as a surprise. *Many developing countries rely heavily on bioenergy to fulfil their energy needs; thus, their low ecological footprint values could result from low levels of development rather than a high proportion of renewable energy in their total primary energy production.*
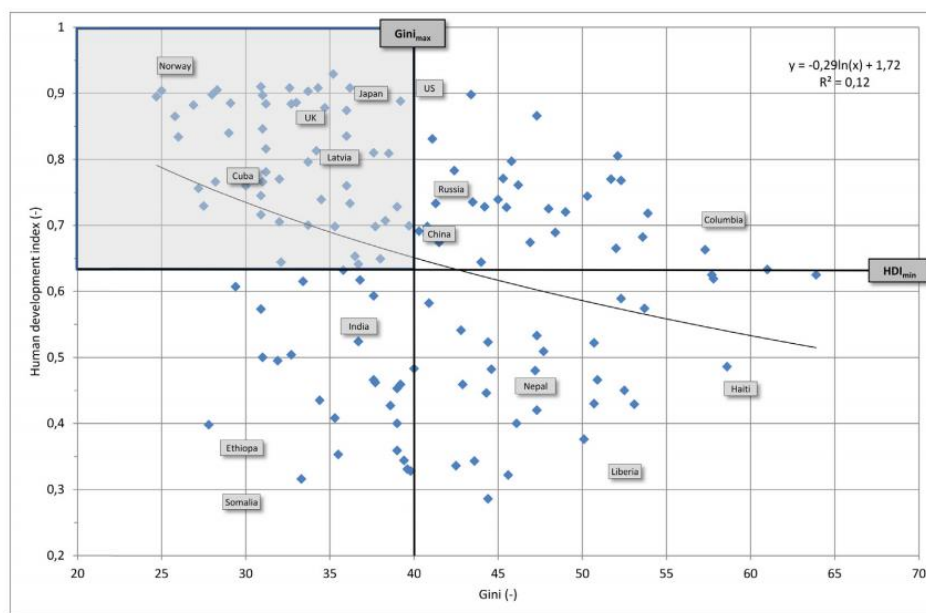
Fig. 4. The sustainable development space (SDS) for dimensions 2 (human development index) and 3 (Gini coefficient). The SDS is in upper left quadrant (shaded). Country data are for 2008/2009 (*N* = 155).

Fig. 3. The sustainable development space (SDS) for dimensions 1 (ecological footprint) and 4 (renewable energy/total energy). The SDS is in the lower right quadrant (shaded). The country data are for 2008/2009 (*N* = 128).
Source: UNDP (2011).

Currently, 61 countries are in the sustainable development space on dimensions 2 (human development index) and 3 (Gini coefficient) (Fig. 4). The regression line in Fig. 4 suggests a negative relation between human development index and Gini coefficient. Thus, countries with low levels of inequality are better positioned to safeguard their inhabitants' basic needs. This finding is in accordance with Wilkinson and Pickett (2009), who found that health and social problems – which prevent societies from providing their inhabitants' basic needs – are more common in countries that have high levels of inequality. Moreover, Wilkinson and Pickett argue that the relationship between high levels of health and social problems on the one hand and high levels of inequality on the other is such that the latter causes the former. Thus, reducing a country's level of inequality (i.e., the Gini coefficient) would subsequently lead to fewer health and social problems, thereby improving the country's ability to meet its inhabitants' basic needs. (Holden et al. 2014)

At system-level the changes requires for a Sustainable Macroeconomy are:

✓ *Change to 100% fractional reserve banking system*

This would in practice mean that banks would not have the power to lend non-existing money at interests; the power would be in governments instead of banks hands.

✓ *Shift the tax policies to:*

→ *Throughput taxes instead of value-added taxes or in other words shift the taxation from "economic goods" to "ecological bads"*

→ *Increase taxes on unearned income*

→ *Increase marginal tax rates to over 90% on high income to contribute to reduce income inequality*

✓ *Incentivize domestic savings, for example through secure (green) national or community-based bonds*

✓ *Outlaw unscrupulous financial practices,*

✓ *Restrict size of financial institutions*

✓ *Provide more consumer debt protection*

✓ *Shift from GDP to GPI or some other indicator*

The story of Sustainability is finally about changing the goals of our current economic system from growth/profit to human well-being. It is about changing our perspective on who we actually are in the Universe.
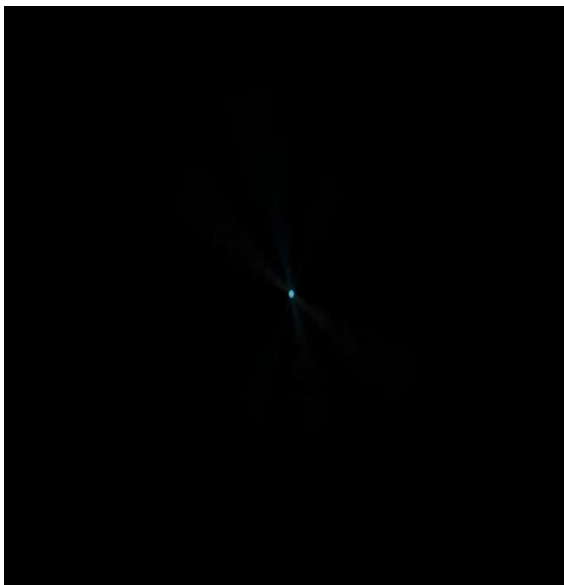

Our posturing, our imagined self-importance, the delusion that we have some privileged position in the universe, are challenged by this point of pale light. Our planet is a lonely speck in the great enveloping cosmic dark. In our obscurity – in all this vastness – there is no hint that help will come from elsewhere to save us from ourselves.

There is perhaps no better demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another and to preserve and cherish the pale blue dot, the only home we've ever known.

Carl Sagan, Pale Blue Dot, 1994

III. (Economic constraints) Global Environmental Crisis and limits to growth – Mislav Žitko

The capitalistic model where the growth imperative is realized by constantly displacing the social and natural boundaries brought modern societies to the point where financial socio-economic and environmental crises converge.
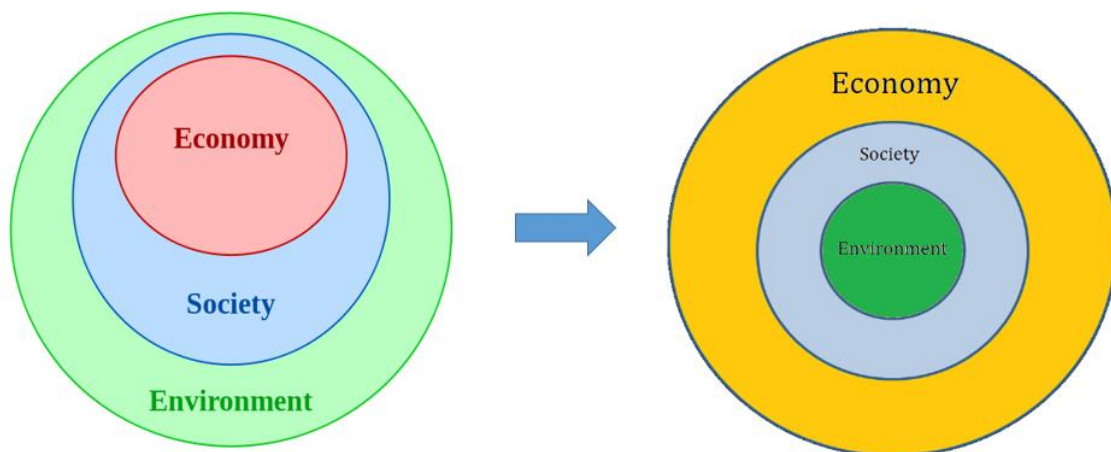
The Green New Deal – *a switch from carbon-based economy to economy based on renewable energy* and green growth – *economic growth that uses natural resources in a sustainable manner* propose a model of economic growth in which natural resources become a commodity.

To understand the way that nature and natural resources appear in the capitalist calculation we can present 2 examples of *financialization* that caused further degradation of ecosystem and negatively affected the quality of human life.

Financialization = the increase of the size and structural importance of financial market within the economic system.

Example 1 – Financialization and food crisis

The financialization of primary commodities causes price boom in primary commodity in the pre-crisis period 2002-2008. The only gainers were the financial intermediaries who were able to profit from the prices changes while:

- Many of the developing countries that depend on imports have seen deterioration in their terms of trade as they are forced to spend a large proportion of their foreign exchange earnings on primary commodity imports (UNCTAD 2011)

- Vulnerable households are not able to afford basic food and energy commodity

- Public funds used to face the food crisis could not be used to improve health, education and other public systems (UNCTAD 2011)

Example 2 – Financialization and commodification of carbon

In 1997 Kyoto Protocol has been converted in the framework of carbon trading instruments and Europe developed the concept in the EU Emission Trading Scheme.

Instead of GHG reduction the carbon trading enhance major polluters to buy pollution permits creating a system in which the buyer pay for polluting while the seller get money for having reduced emissions.
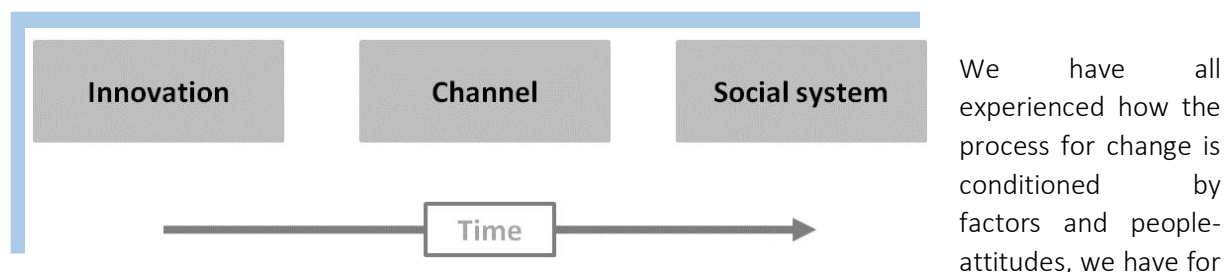
The Kyoto protocol and ET ETS do not reduce the GHG emissions, on the contrary, as the systems do not foresee any obligations to design environmental sustainable policies, contributed to its increase.

The failure of global climate policy may find its reasons in influence of lobbies that profit from fossil-fuel use, weak international legal framework, corruption of political parties in capitalist countries but Marxian analysis attributes the main reason to the ability of neoliberalism to present market solution for market problems as the only ones possible, the neoliberalism power is in the presentation of solutions under the must 'there is no alternative'. (LOHMANN 2010, 133).

Economic model based on democracy and sustainability can be realized only if the arguments of limits to growth and the fact that capitalism did not generate prosperity are seriously taken.

The concepts of 'sustainability' or 'climate capitalism' emerged in the report from international summits and conference (Kyoto, Copenhagen, Rio +20...) are quite confusing and do not create a solid base for new policies: there is a need for environmental sustainability and social justice to be comprehensively and coherently designed into an alternative to capitalism.

IV. Motivation and readiness for change in educational organizations: who is for, who is neutral & who is against? – *Bojana Ćulum*

We have all experienced how the process for change is conditioned by factors and people-attitudes, we have for sure in our entourage experienced how some people are more ready than other to accept and adopt changes and innovations!

Before presenting *the innovation diffusion line* and *adopters categorie*s, we need to clarify some of the key concepts.

What is an innovation and what characterise innovativeness?

INNOVATION

→ An idea, practice or project perceived as new by an individual or other unit of adoption
→ Innovation's newness is relative to both place and population
→ Tangible (objects, devices, medicine) and intangible (pedagogical technique)
→ Not adopted by all individuals in a social system at the same time
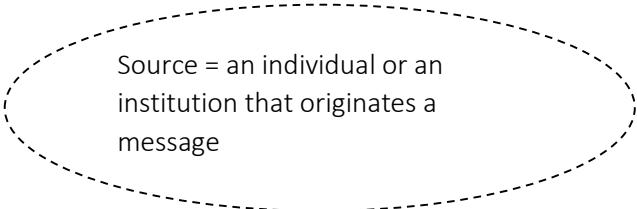→ Tendency to be adopted in a time sequence

INNOVATIVNESS

→ Degree to which an individual is relatively early in adopting a new idea then other members of a social system
→ Adoption of a new idea is caused by human interaction through interpersonal networks in their own social system
(Rogers, 1957, 1962, 1995)

The Diffusion of Innovations describes the process in which an innovation is communicated through certain channels over time among the members of a social system! The Diffusion of Innovations is a very social process that involves interpersonal communication relationships.
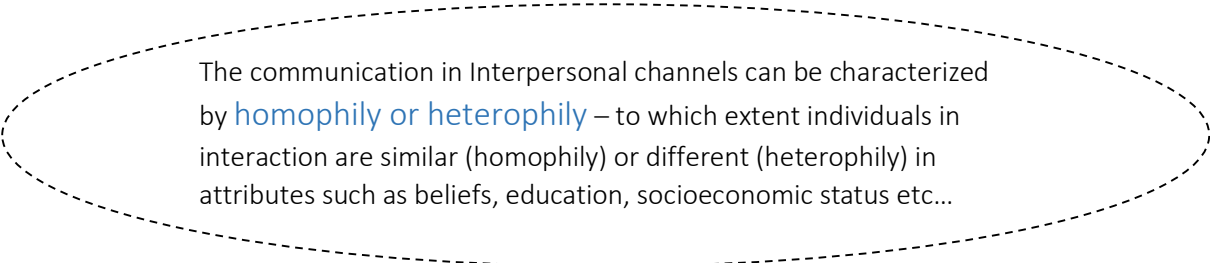
We have defined the first key element of the Diffusion process (Innovation), the second key elements are the communication channels:

Communication: a process in which participants create and share information with one another in order to reach a mutual understanding and it occurs through channels between sources

> Source = an individual or an institution that originates a message

Mass media and interpersonal communication are the two most important channels: we have mentioned how the Diffusion of Innovation is a very social process, the interpersonal channels, therefore, are more powerful.

> The communication in Interpersonal channels can be characterized by homophily or heterophily – to which extent individuals in interaction are similar (homophily) or different (heterophily) in attributes such as beliefs, education, socioeconomic status etc…

Every social system is heterophilious and this is one of the most distinctive problems of the Diffusion.

Among the communication channels, we also distinguish the localite channels (within social system) and cosmopolite channels (outside sources).
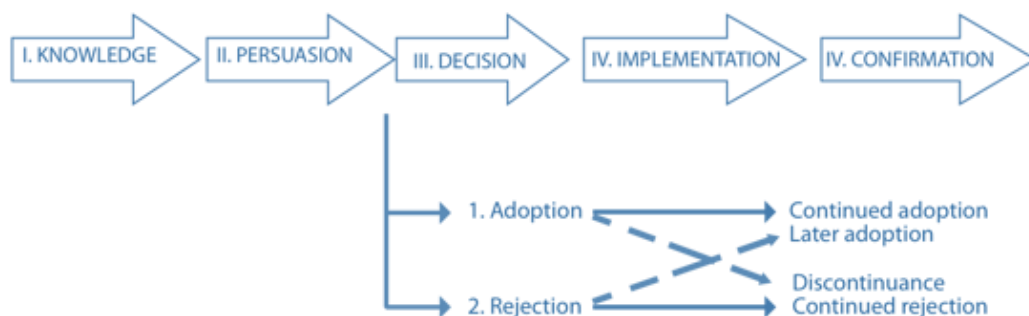
The interpersonal channels can be both localite and cosmopolite while mass-media channels are cosmopolite. The distinction between localite/cosmopolite channels is very important to understand the innovation-decision process because the cosmopolite channels are more important at knowledge stage while localite channels are more important at the persuasion stage.

The third key element is time – the time dimension influence the diffusion of innovation process as well as the adoption process. The time dimension brings to the process another level of complexity as it influences the process at individual and system level.

The fourth key element is the social system – a set of interrelated units engaged in joint problem solving to accomplish a common goal. The diffusion of innovation taking place in social systems is largely influenced by its structure. Moreover the social system affects individuals' innovativeness over time.

The path that brings the individual from awareness about an innovation to its implementation/reinvention and confirmation is analysed in the decision-innovation process.

The decision-innovation process develops through five time-ordered stages: knowledge, persuasion, decision, implementation and confirmation.
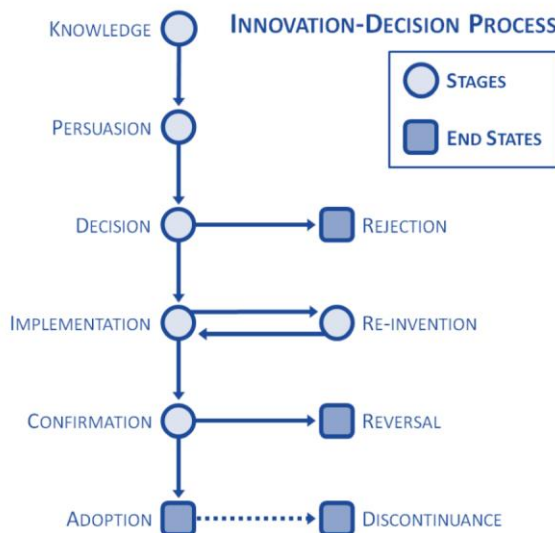

The knowledge stage: individual learns about the existence of innovation and seeks for relevant information with the aim to determine what innovation is and how and why it works.
The persuasion stage: the individual develop negative or positive attitudes toward the innovation. The opinion is influenced by the degree of uncertainty about the innovation functioning and by others opinion.

The decision stage: the individual choose to adopt or reject innovation. Rejection is possible in every stage of the process and we distinguish active rejection (= after trial period an individual decides to not accept the innovation) and passive rejection (= individual does not think about accepting innovation at all). Especially in collectivistic cultures, persuasion can occur after decision.
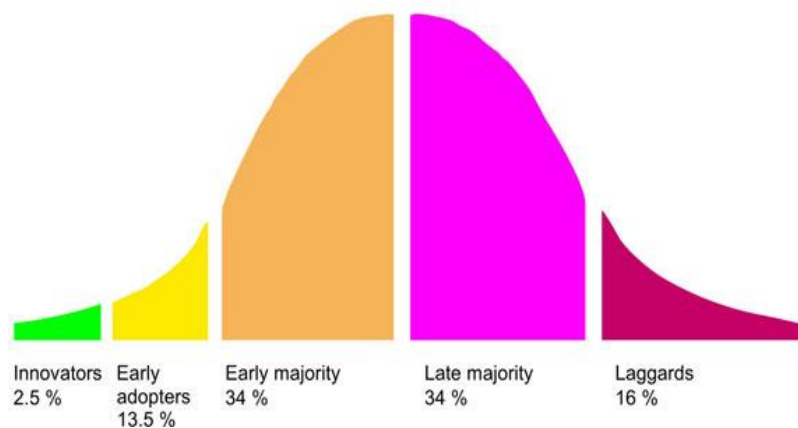The implementation stage: the innovation is put in practice. The uncertainty about the outcomes is still present. At this stage, we can also have a reinvention process – the modification of the innovation to better suit needs, beliefs…

The confirmation stage: the individual looks for support for the decision taken and it can be still reversed if the individual receives conflicting messages about the innovation: at this stage the individual attitudes become crucial. Depending on the support the individual receive adoption of the innovation or discontinuance (if the innovation does not meet the need or is replaced by another innovation) may happen.

Who are the individuals that initiate the innovation, who are the one ready to adopt it and who are the ones against?

Rogers (2003) defines the adopter categories on the basis of innovativeness: the distribution of adopters in a social system is a normal distribution:

Innovators: individuals willing to experience new ideas. They are the ones that brings the innovation in the system. They need to be ready to cope with unsuccessful innovation. They represent a tiny percentage of the market and often not highly regarded by other members of the social system.
Early adopters: individuals motivated by the innovation potential and comfortable with risk-taking. Their opinion is very influential in market because they act as role model. Other members of social members will refer to them to get information about the innovation.

Early majority: their innovation-decision taks more time than in the first two groups but they play a fundamental role in the late adoption as they have very good interaction with other members of the social system. They are pragmatist that will adopt the innovation after it is proven and they are the largest group of the market.

Late majority: as the early majority they cover 1/3 of all members of the social system. They will wait until their peers adopt the innovation and usually under peer or management pressure. They tend to be conservative and they need to know there is no risk before adopting the innovation.

Laggards: they will adopt the innovation only if forced. Their innovation-decision process is very long.

| resources, desire and willingness to take on risk to try new things | opinion leaders: selective about technologies they adopt | willing to embrace: look to understand how it fits with their lives | adopts with skepticism: most of the uncertainty must be resolved | last to adopt with aversion to change |

Parallel to innovation adoption, innovation from the development phase becomes mainstream (maturity) and then declines.

Who is who in your team, school, organization?

When it comes to the introduction of Sustainability Education in the curriculum and in school policies and practices, the Rogers theory may help us support the innovation and handle its diffusion!
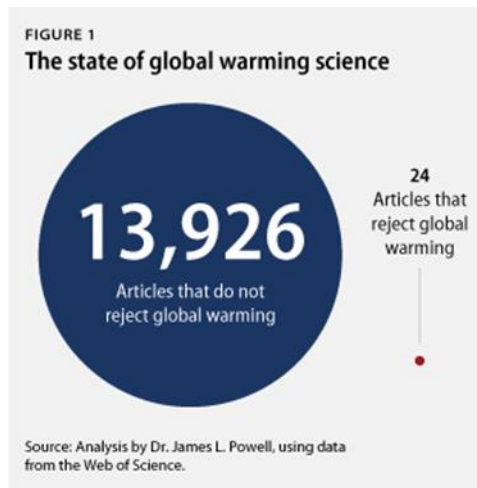Trying to convince the mass of new ideas is useless. Convince Innovators and early adopters first!¨

I. Education for Sustainability – *Mladen Domazet*

Education for Sustainability…

FIGURE 1
The state of global warming science

13,926
Articles that do not reject global warming

24
Articles that reject global warming

Source: Analysis by Dr. James L. Powell, using data from the Web of Science.

Why?

To debunk two myths about place of sustainability content in compulsory education

M1 – Human activities are not a significant contributor to global climate change, it is unavoidable…

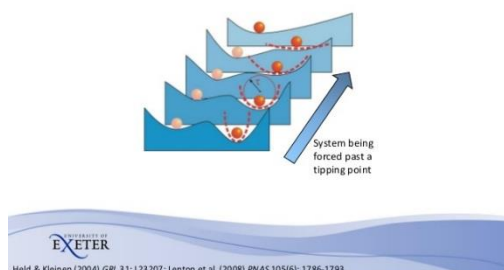The figure 1 shows how the relation is 13,926 vs 24. It means that 0,17% of articles published reject global warming!

M2 – Sustainability concepts are too difficult to be taught in schools

We could argue the same for most of the concept taught in schools. Nevertheless, we need to think how/when to present the sustainability concepts and how to organize its content in the curriculum!

2 facts about education and sustainability

– Media tends to present the environmental crisis using sensationalist rhetoric, education should provide knowledge that will enhance students to critically read and interpret the news about the environmental issues!

Early warning prospects

System being forced past a tipping point

EXETER
Held & Kleinen (2004) GRL 31: L23207; Lenton et al. (2008) PNAS 105(6): 1786-1793

- Tipping points in climate changes show how changes could have irreversible effects. Currently our planet is in the fourth stage: with immediate efforts we can still contain the damages. The next stage is non-returning point.

The need for sustainability education cannot be postponed.

How?

We should teach about and for sustainability, combining learning by imitation and adoption of factual knowledge through interdisciplinary approach!

The aim of education for sustainability should be much broader than the climate awareness as the environmental crisis is interconnected with the social and economic ones. Moreover, the focus on ecological issue does not enhance the discussion about the alternative world vision, values etc...

The contents of current education contribute to the promotion of the current systems: development, growth, competitiveness…

Future and Environment in the curriculum

The analysis of Croatian primary curriculum shows how the environmental issues are differently presented in the last three decades: from 1974 to 1999 we can see the change in presenting the environmental issue firstly from localised pollution to ecosystem collapse and systemic global changes. In 2000s the explicit environmental threat is removed and climate change references reduced. In the curriculum it is also evident how the trust in technological progress vanishes.

In 1974 primary curriculum, parallel to the future predicted with positive connotation (progress, material wealth) it is also threatened by nuclear war, industrial pollution…in the 2006 curriculum the future predicts changes to which students need to be prepared for, while in the 2011 curriculum the perspective of unpredictable changing world emerges.

Symptomatic is the fact that while in 1974 in the curriculum the need to empower young people to be engaged in creating better life emerges, in 1991 we assist at the celebration of man's abilities to solve difficult problems including ecological ones.

Current education systems, according to UNECE report 2012, contribute to unsustainable life style through lack of opportunity to question existing lifestyles and social systems that promote this lifestyle and reproducing un-sustainable models and actions.

If education cannot achieve any changes alone, it can play an important role as schools actors are community actors and factor of changes.

According to UNECE report 2012 education system need to:

a) Have a holistic approach

- Integrative thinking (global-local), include range of perspectives, connect topics into complex whole

b) Envision change: based on past, present and future

- Root causes of current development, engage with present injustice, and explore alternative futures

c) Achieve transformation in individuals, teaching practices and formal education systems

- Current formal education does not predispose learners to consider sustainability across their lives

The skills and values in the Curriculum – ENjoinED Initiative[1]

The comparative analysis of education for Sustainability content in 9 European Countries demonstrated that most of existing ESD knowledge is about social and cultural aspects.

Interesting aspects of the research regard the analysis of skills and values present in the curricula analysed. The skills and values were divided in 5 groups. The analysis of skills and values present in the curricula show the SV group *Managing change and uncertainty* is moderately represented in the framework and in 2 case this is the least represented group. The SV groups managing change and uncertainty is considered highly relevant for the SUSTAINABILITY EDUCATION as in the transition of our societies future generations will be expected to manage changes and make decision in uncertainty.
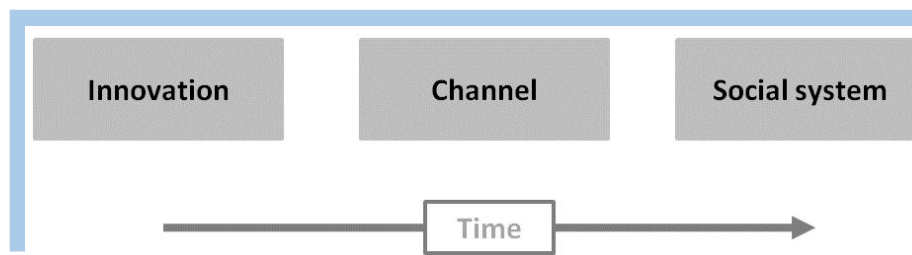
The study showed how sustainability education content is present in the curricula but it is not foundational principle of compulsory education. The present content needs to be connected and framed according to sustainability principles.

As already mentioned, we cannot expect education to achieve the desired changes in societies but it must play a role in empower students to be actors of changes.

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[1] The objectives of the project were to map the coverage of climate change, environmental protection and sustainable development in pre-secondary national curricula of four IPA, one ENPI and three new EU countries; to forge a sustainable partnership between educational and environmental CSOs at national and regional levels; to develop educational modules for adults, targeted at private enterprises, public authorities and pre-secondary and secondary school teachers and to develop and advocate policy recommendations outlining the inclusion of essential environmental protection and sustainable development subjects into national pre-secondary education curricula. These objectives were met through activities such as the development of a research matrix; research on national curricula; presentation of research findings and discussion; conducting comparative research; initiative website development and maintenance; workshops on: climate and energy, school environmental education, EU climate and environmental policies, environmental protection and climate change, reading and writing for critical thinking educational methodology; development of adult educational modules for teachers, public authorities, businesses; Policy Lab seminar; writing and advocacy of 7 national environmental education policy briefs and, finally, a regional conference. Founded by European commission the project has been implemented in 2010-2012.

V. Motivation and readiness for change in educational organizations: who is for, who is neutral & who is against? – *Bojana Ćulum*

We have all experienced how the process for change is conditioned by factors and people-attitudes, we have for sure in our entourage experienced how some people are more ready than other to accept and adopt changes and innovations!

Before presenting *the innovation diffusion line* and *adopters categorie*s, we need to clarify some of the key concepts.

What is an innovation and what characterise innovativeness?

INNOVATION
→ An idea, practice or project perceived as new by an individual or other unit of adoption
→ Innovation's newness is relative to both place and population
→ Tangible (objects, devices, medicine) and intangible (pedagogical technique)
→ Not adopted by all individuals in a social system at the same time
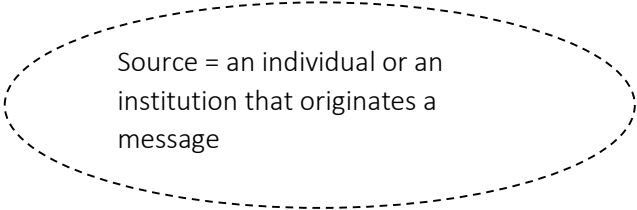→ Tendency to be adopted in a time sequence

INNOVATIVNESS
→ Degree to which an individual is relatively early in adopting a new idea then other members of a social system
→ Adoption of a new idea is caused by human interaction through interpersonal networks in their own social system
(Rogers, 1957, 1962, 1995)

The Diffusion of Innovations describes the process in which an innovation is communicated through certain channels over time among the members of a social system! The Diffusion of Innovations is a very social process that involves interpersonal communication relationships.
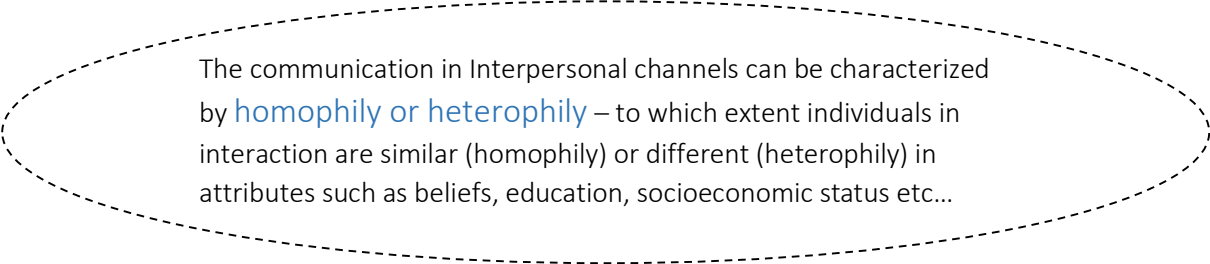
We have defined the first key element of the Diffusion process (Innovation), the second key elements are the communication channels:

Communication: a process in which participants create and share information with one another in order to reach a mutual understanding and it occurs through channels between sources

> Source = an individual or an institution that originates a message

Mass media and interpersonal communication are the two most important channels: we have mentioned how the Diffusion of Innovation is a very social process, the interpersonal channels, therefore, are more powerful.

> The communication in Interpersonal channels can be characterized by homophily or heterophily – to which extent individuals in interaction are similar (homophily) or different (heterophily) in attributes such as beliefs, education, socioeconomic status etc…

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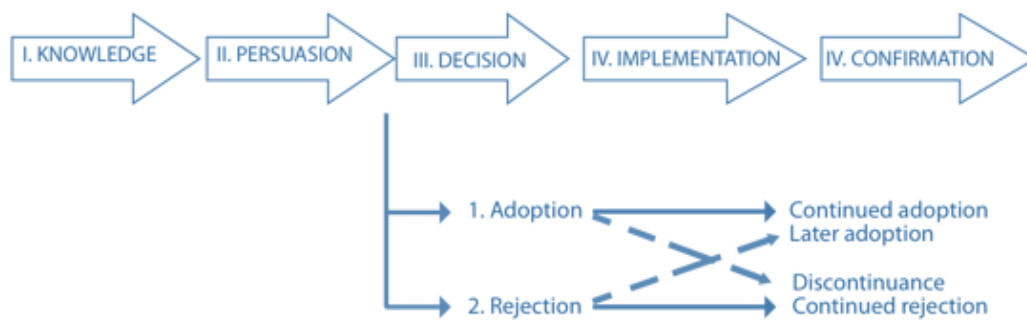
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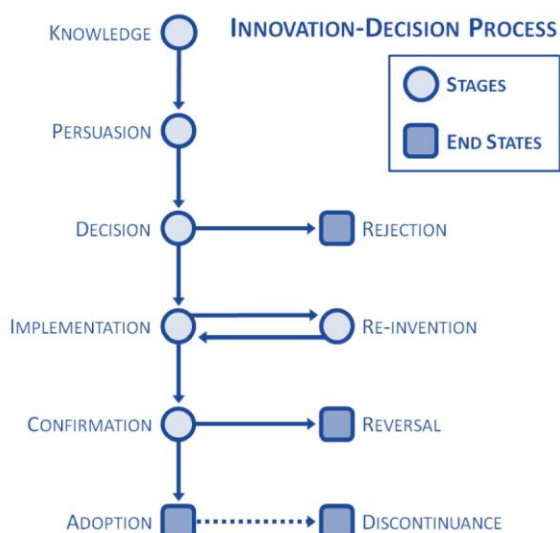
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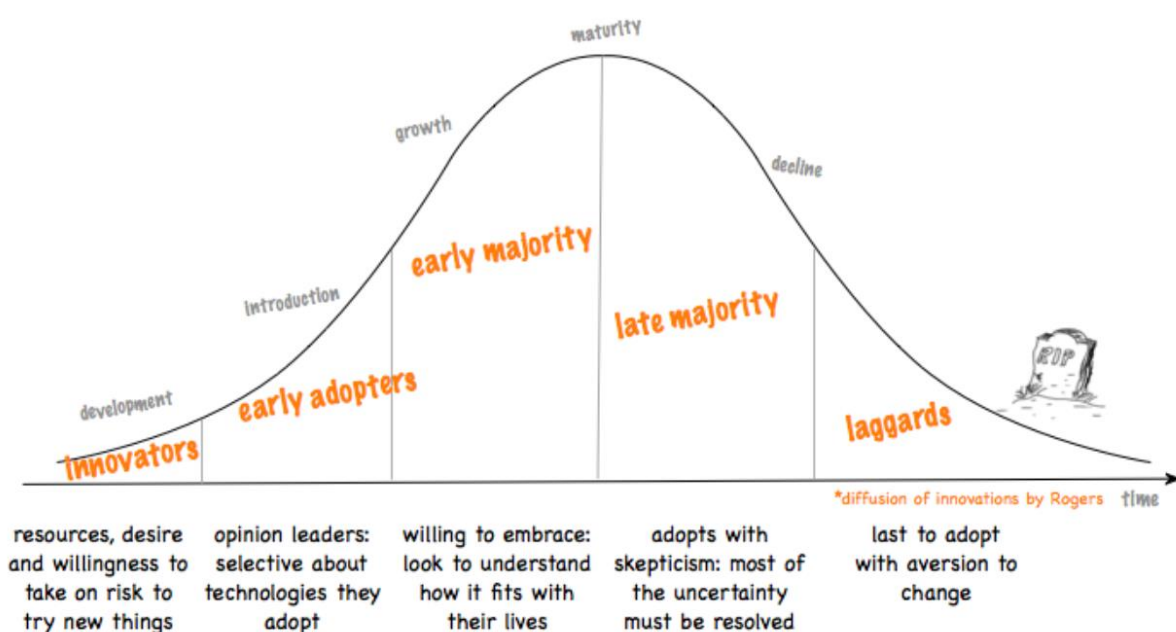| Innovators 2.5 % | Early adopters 13.5 % | Early majority 34 % | Late majority 34 % | Laggards 16 % |

Innovators: individuals willing to experience new ideas. They are the ones that brings the innovation in the system. They need to be ready to cope with unsuccessful innovation. They represent a tiny percentage of the market and often not highly regarded by other members of the social system.
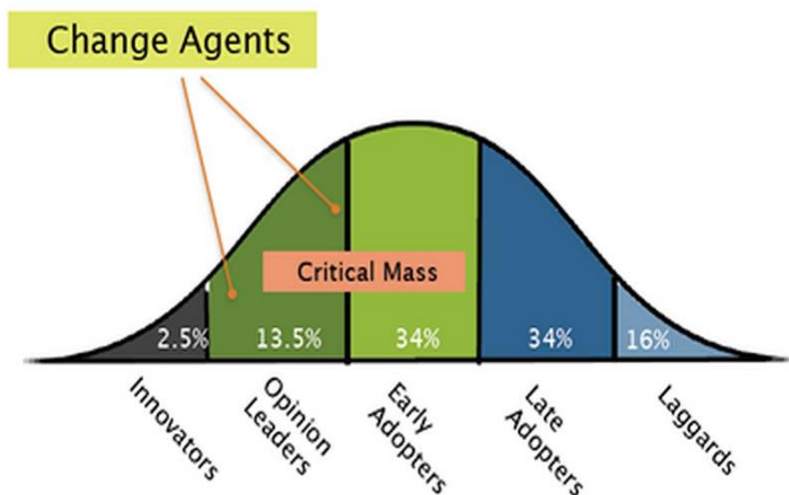
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Who is who in your team, school, and organization?

When it comes to the introduction of Sustainability Education in the curriculum and in school policies and practices, the Rogers theory may help us support the innovation and handle its diffusion!

Trying to convince the mass of new ideas is useless. Convince Innovators and early adopters first!¨

4 FOLLOW-UP PLANS

The Follow-up plans presented in this section are the results of participants' contribution during the Participative Learning Session (PLS). The aim of PLS was to empower participants to design follow up activities/policy recommendations for change based on learning from lectures, discussion circles and workshops.

I. Teacher-Training module

The teacher training module developed by participants has the following features:

→ In-service teacher training
→ Included as integral part of School Development Plan
→ It is on a voluntary basis
→ The sustainability of the training is guaranteed by the establishment of Mentoring/Support Team and the employment of Sustainability Education Coordinator

Topics of the TT: Mutual care and support; healthier living; promoting degrowth; reduce the gap between rich & poor.

Approach: school based; holistic and participatory; 3Hs: Heart, head, hands.

Training structure:

(1) Theoretical framework	(2) Teaching & Learning methods
The training aims to provide teachers with significant information and knowledge regarding the Sustainability topic covering the environmental, social and economic perspectives. The content of these lectures would be defined and presented by Sustainability experts and education specialists.	The second part of the training will provide innovative and learning methods on how to introduce and translate the sustainability knowledge gained in the first part in classroom activities using the methodology of Teacher Leadership.

The training will be delivered through several meetings (6-8) through one school year. During the meetings teacher are invited to design curricular and extra-curricular activities:

(a) Curricular activities: project teaching (e.g. topic for a semester); collaborative activities involving all stakeholder; dissemination of results
(b) Extra-curricular activities: activities involving parents and community based on the community reality.

II. Extra-curricular activities

'Fashion' Skills for Sustainable Lifestyle

The plan for extra-curricular activities **covers one school year**, based on participatory approach emphasizing:

- skills not topics
- less consumption
- explore and participate
- multidisciplinary approach

- networking
- developing creativity
- team building

Target: Primary and Secondary School, Children in Urban and Rural Areas

Preparation phase:

→ Introduce the issue/topic to students, teachers, parents, local communities, local NGOs…
→ Interview and select teachers – identify right teachers with motivation, values, technical staff, etc.
→ Develop the plan of extracurricular activities aiming to develop Skills for Sustainable life style

Implementation phase:

Type of activities

- *Environmental Activities* I Gardening, producing, different groups, comparative analyses, statistics, mapping I Collecting plants that are used as medicine, selling them, which is social entrepreneurship – analyses, research, etc.I Using study tours, camps, inviting international volunteers – to be more close to nature and to reality I

- *Arts and Culture Activities* | Organize Artistic exhibitions from garbage, used items… | Documentary movie making | Making puppets for local theater |

- *Scientific Activities* | Competitions from young inventors, young researchers and scientists (to develop scientists in every child) | Alternative energy producing – Solar energy, kinetic energy | Small analyses and research for students |

- *Multimedia* | Series of films/ films screenings, have a speakers from the relevant field, discussions | Newspaper – develop journalism | Presentation, Communication, Negotiation Skills |

- *Civic Activities and others* | 'Our good' - services/experience/knowledge exchange |

  Exchange fairs Involved Students | connecting students with NGO |

Evaluation phase:

- Evaluation of Activities
- Recommendations
- Share Experience to other communities/schools, etc.
- Correct, refine, adjust and develop activities according to the evaluation findings

III.   Do more research

Participants developed two research ideas: one centred on the implementation of ESD in policy and one centred on children knowledge and reaction in case of natural disaster.

(1) Analysis of implementing the Education for Sustainable Development (ESD) policy

Aim of the research:

- To analyse the experience of the countries in the implementing of the ESD policy in school education, considering the socio-economic and ideological conditions of each particular country
- To define recommendations for policy-makers, national standards and curricula designers for further support of the ESD policy.

Research Questions:

1. What state or international programs exist for implementing the ESD policy?
2. Is the ESD declared as one of state priorities? Is the ESD declared obligatory in the state education? (What requirements? are they among educational goals?)
3. Are the key ESD competences (skills) described as the expected educational outcomes in the national school curriculum?
4. Do the key ESD competences (skills) involve main criteria in the national school curriculum that can indicate their development? Does the implementation of the national school curriculum lead to acquisition of the students' ESD competences?
5. Are the levels of the key ESD competences (skills) described? Are they subject-specific? Which subjects?
6. Monitoring and Assessment (formative, summative, who assesses and evaluates, any national studies?)
7. Who is involved in the implementing the ESD policy?
8. Are there any in-service (pre-service) ESD training courses for teachers? (What resources are used? What subject areas? Particular units in the course or throughout the whole course? Who provides these trainings)

9. Are there teaching and learning resources on ESD available for schools students and teachers? (Textbooks, etc.?) Are there any extra-curricular activities, local community projects?

(2) Education for Sustainable Development: Disaster Risk Reduction at Schools

Background of the Study Idea

On June 13th, severe flooding affected Tbilisi: heavy rainfall turned the Vere River in the center of Tbilisi into a raging torrent. Roads washed out, hillsides collapsed; flood swept away houses, vehicles, trees. More than 20 people died and more than 30 were injured. Half of the zoos 600 animals lost. Total damage estimated at $100 mln.

The events that lead to the disaster:

- Vast amounts of rain falling over one small area fed the River Vere which burst its banks, large landslides formed, carrying trees and rocks not able to pass the channel of Vere river

- Construction of a new highway and an alteration of Vere's river bed, contrary to hydrologists' findings that the tunnel that diverted the water was too small for the worst case scenario

- Excessive construction permits along the Vere river, poor urban planning and development

- Government's lack of preparation for the disaster (late response and recovery efforts), lack of empathy towards animals (killing instead of use of tranquilizers)

- Low awareness of citizens of disaster preparedness and response measures.

Studies/information needed:

- Analysis of causes of tragic events
- Identification of citizens' primary concerns
- Assessment of State's disaster preparedness plan (with special focus on the role of MoEs)
- Assessment of MoES's organizational capacity (management, human and financial resources, cooperation with other agencies, service delivery)
- Review of emergency preparedness plans in education system
- Children opinion survey (the needs of most vulnerable in emergencies)

Possible Activities

- Advocacy for implementation of policies aimed at strengthening capacities of the education sector to prepare and to manage response to natural disasters and sustainable development challenges
- Fundraising with donors for ESD and disaster risk reduction-related projects at schools

- Implementation of projects at schools: improvement of prevention measures, safe learning environment, conducting teaching and principal training in disaster prevention and preparedness and delivery of a new curriculum
- Development of ESD and emergency prevention and preparedness curriculum at schools
- Monitoring of curriculum delivery and evaluation of safety measures and school infrastructure at schools.

Defining Curriculum Content

- Goals: to help children to become prepared for disasters and other emergencies at different levels (elementary, upper elementary and middle schools levels); reduce their anxiety about unknown aspects of disasters
- Different modules to strengthen children's knowledge on contemporary issues: sustainable development, globalization, climate's change, environmental degradation, and their effects on children's lives (air pollution, safe food, fresh water, waste, energy, etc.)
- Education on values and behaviors affecting achievement of sustainable future
- Practical steps children have to take in case of emergency
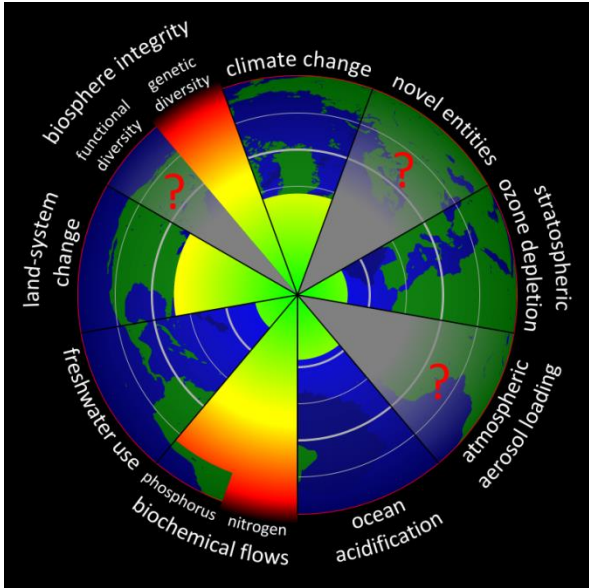- Skills for problem solving, coping and recovering from the natural disasters.

IV.   Glossary

Participants listed the definition the most important terms of theories and concepts presented through the lecture.

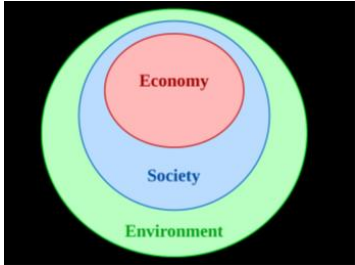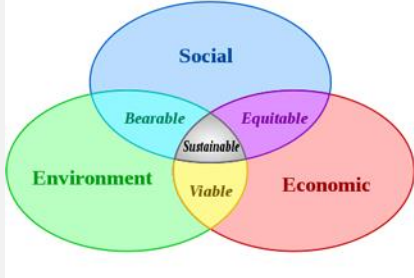| ANTHROPOCENE	Relating to or denoting the current geological age, viewed as the period during which human activity has been the dominant influence on climate and the environment. http://www.oxforddictionaries.com/definition/english/Anthropocene
CLIMATE CHANGE	Refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from: • natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; • natural processes within the climate system (e.g. changes in ocean circulation); • human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc.) U.S. Environmental Protection Agency (December 1997) http://www.epa.gov/OCEPAterms/ [accessed 16 December 2009]
DEGROWTH	Sustainable degrowth is a downscaling of production and consumption that increases human well-being and enhances ecological conditions and equity on the planet. It calls for a future where societies live within their ecological means, with open, localized economies and resources more equally distributed through new forms of democratic institutions. Such societies will no longer have to "grow or die." Material accumulation will no longer hold a prime position in the population's cultural imaginary. The primacy of efficiency will be substituted by a focus on sufficiency, and innovation will no longer focus on technology for technology's sake but will concentrate on new social and technical arrangements that will enable us to live convivially

	and frugally.
	Degrowth does not only challenge the centrality of GDP as an overarching policy objective but proposes a framework for transformation to a lower and sustainable level of production and consumption, a shrinking of the economic system to leave more space for human cooperation and ecosystems.
	http://www.degrowth.org/definition-2
Decade of Education for Sustainable Development (DESD) 2004 – 2015	In its 57th meeting in December 2002, the United Nations General Assembly proclaimed the UN Decade of Education for Sustainable Development, 2005- 2014, (DESD) 'emphasizing that education is an indispensable element for achieving sustainable development'. It also designated UNESCO as the lead agency to promote and implement the Decade. The vision of ESD is a world where everyone has the opportunity to benefit from quality education and learn the values, behavior and lifestyles required for a sustainable future and for positive societal transformation. http://www.desd.org/
ECOLOGICAL ECONOMY	Ecological economics is a trans-disciplinary field. It's not trying to be a subdiscipline of economics or a subdiscipline of ecology, but really it's a bridge across not only ecology and economics but also psychology, anthropology, archaeology, and history. That's what's necessary to get a more integrated picture of how humans have interacted with their environment in the past and how they might interact in the future. It's an attempt to look at humans embedded in their ecological life-support system, not separate from the environment. It also has some design elements, in the sense of how do we design a sustainable future? It's not just analysis of the past but applies that analysis to create something new and better. (By Robert Constanza) http://insights.som.yale.edu/insights/what-ecological-economics
ECOLOGICAL FOOTPRINT (CARBRON FOOTPRINT)	An estimation of how much carbon dioxide is produced to support your lifestyle. Essentially, it measures your impact on the climate based on how much carbon dioxide you produce. Factors that contribute to your carbon footprint include your travel methods and general home energy usage. Carbon footprints can also be applied on a larger scale, to companies, businesses, even countries.
EDUCATION FOR SUSTAINABLE DEVELOPMENT	It means including key sustainable development issues into teaching and learning; for example, climate change, disaster risk reduction, biodiversity, poverty reduction, and sustainable consumption. It also requires participatory teaching and learning methods that motivate and empower learners to change their behavior and take action for sustainable development. ESD consequently promotes competencies like critical thinking, imagining future scenarios and making decisions in a collaborative way. ESD requires far-reaching changes in the way education is often practiced today. UNESCO is the lead agency for the UN Decade of Education for Sustainable Development (2005-2014).
ENVIRONMENTAL EDUCATION	A process in which individuals gain awareness of their environment and acquire knowledge, skills, values, experiences, and also the determination, which will enable them to act - individually and collectively - to solve present and future environmental problems.
ENVIRONMENTAL JUSTICE	The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development,

	implementation, and enforcement of environmental laws, regulations, and policies.
ENVIRONMENTAL TRESHELOD (POINT OF NO RETURN)	The point at which a relatively small change in external conditions causes a rapid change in an ecosystem. When an ecological threshold has been passed, the ecosystem may no longer be able to return to its state. Crossing an ecological threshold often leads to rapid change of ecosystem health. Ecological threshold represent a non-linearity of the responses in ecological or biological systems to pressures caused by human activities or natural processes. Critical load, tipping point and regime shift are examples of other closely related terms.
ENVIRONMENTAL RESILIANCE	The capacity of an ecosystem to respond to a perturbation or disturbance by resisting damage and recovering quickly. Such perturbations and disturbances can include stochastic events such as fires, flooding, windstorms, insect population explosions, and human activities such as deforestation, fracking of the ground for oil extraction, pesticide sprayed in soil, and the introduction of exotic plant or animal species. Disturbances of sufficient magnitude or duration can profoundly affect an ecosystem and may force an ecosystem to reach a threshold beyond which a different regime of processes and structures predominates. Human activities that adversely affect ecosystem resilience such as reduction of biodiversity, exploitation of natural resources, pollution, land-use, and anthropogenic climate change are increasingly causing regime shifts in ecosystems, often to less desirable and degraded conditions.
ENVIRONMENTAL PARADOX	The green paradox, identified by German economist Hans-Werner Sinn, is the observation that an environmental policy that becomes greener with the passage of time acts like an announced expropriation for the owners of fossil fuel resources, inducing them to accelerate resource extraction and hence to accelerate global warming.
ENTHROPY	It is a fundamental concept that applies to all nature, including human activity. There are various ways to describe the concept of entropy: A measure of the disorder that exists in a defined system. Higher entropy means higher disorder. A closed system (isolated such that no matter/energy enters or leaves the system) always increases. This is the Second Law of Thermodynamics. The entropy of the universe (the ultimate closed system) always increases. The entropy of an open system (a system that exchanges matter/energy with its environment) can increase or decrease, but if it decreases, the entropy of its total environment must increase such that the entropy of the universe increases. To decrease the entropy of a system, it must be open. This is how biological systems decrease their entropy (increase their order); they do so by increasing the entropy of the sun and their environment. They are open to "external" systems. To keep the increase of entropy of a system to a low value, make the system as open as possible. The last statement is the one of most importance in trying to achieve sustainable development. In a development context the "system" should be defined in the usual way as the part designed and built by humans and include the environment to which it is unavoidably open. To have low-entropy (sustainable) development it is necessary to redefine the "system" to be designed and built to include as much of the environment as possible. http://www.roperld.com/science/minerals/EntropySustain.htm
GLOBAL WARMING	Global warming is an average increase in the temperature of the

	atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities. The Earth's average temperature rose about 0.6° Celsius (1.1° Fahrenheit) in the 20th century. According to different assumption about the future Behaviour of mankind, a projection of current trends as represented by a number of different scenarios gives temperature increases of about 3° to 5° C (5° to 9° Fahrenheit) by the year 2100 or soon afterwards. A 3°C or 5° Fahrenheit rise would likely raise sea levels by about 25 meters (about 82 feet).
GREAT ACCELERATION (EXPANENTIAL GROWTH)	Exponential growth occurs when anything is increasing at a fixed percentage, such as 1% or 7%. Our global population has been growing exponentially. As a result, we have been consuming resources such as food, water, coal, oil and natural gas at exponential rates. Our current lifestyle absolutely depends on exponential growth of our economy. In fact, the definition of an economic recession is when we experience more than three consecutive quarters without exponential growth. But, we live on a finite planet and the exponential consumption of finite resources is not sustainable. https://sustainabilityissues.wordpress.com/exponential-growth/
GREEN ECONOMY	One that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive.
GROWTH	Increase in a country's productive capacity, as measured by comparing gross national product (GNP) in a year with the GNP in the previous year. Increase in the capital stock, advances in technology, and improvement in the quality and level of literacy are considered to be the principal causes of economic growth. In recent years, the idea of sustainable development has brought in additional factors such as environmentally sound processes that must be taken into account in growing an economy. http://www.businessdictionary.com/definition/economic-growth.html
NEW INSTITUTIONALISM	Interplay of the different institutions within society, and how their dynamics, rules and norms determine the behavior and actions of individuals; Comes from (old) institutionalism, which is focused on state/government and their various laws and practices which are applied to citizens.
PLANETARY BOUNDRIES (ENVIRONMENTAL CEILING)	A "safe operating space for humanity" for the international community, including governments at all levels, international organizations, civil society, the scientific community and the private sector, as a precondition for sustainable development. This framework is based on scientific research that indicates that since the Industrial Revolution, human actions have gradually become the main driver of global environmental change. The scientists assert that once human activity has passed certain thresholds or tipping points, defined as "planetary boundaries", there is a risk of "irreversible and abrupt environmental change". The scientists identified nine Earth system processes which have boundaries that, to the extent that they are not crossed, mark the safe zone for the planet. However, because

of human activities some of these dangerous boundaries have already been crossed, while others are in imminent danger of being crossed.

POLITICAL ECOLOGY	The study of the relationships between political, economic and social factors with environmental issues and changes. Political ecology differs from apolitical ecological studies by politicizing environmental issues and phenomena.
RENEWABLE ENERGY	The term renewable energy generally refers to electricity supplied from renewable energy sources, such as wind and solar power, geothermal, hydropower, and various forms of biomass. These energy sources are considered renewable sources because they are continuously replenished on the Earth.
RESPONSIBLE CONSUMPTION	A concerted effort to purchase and use goods and services that have low environmental footprints and provide a positive economic impact where feasible
SOCIAL METABOLISM	A notion used to characterize the processes of energy and material transformation in a society that are necessary for its continued existence, sustainability or Autopoiesis. In order to maintain this, those transformations cannot overpass the thresholds posed by the Ecosystem Metabolism." (http://societalmetabolism.org/?page_id=412)
SOCIAL SUSTAINABILITY	The ability of a community to develop processes and structures which not only meet the needs of its current members but also support the ability of future generations to maintain a healthy community. http://www.businessdictionary.com/definition/social-sustainability.html#ixzz3eSwptTLW
STEADY STATE ECONOMY	An economy structured to balance growth with environmental integrity. A steady state economy seeks to find an equilibrium between production growth and population growth. The economy aims for the efficient use of natural resources, but also seeks fair distribution of the wealth generated from the development of those resources. http://www.investopedia.com/terms/s/steady-state-economy.asp#ixzz3eSvTghPl
SUSTAINABLE DEVELOPMENT	Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within two key concepts:

	the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and
	• the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

https://www.iisd.org/sd/

SUSTAINABILITY	Weak	Strong
	In more general terms, sustainability is the endurance of systems and processes. The organizing principle for sustainability is sustainable development, which includes the four interconnected domains: ecology, economics, politics and culture.	

ULTRASOCIALITY	Ultrasociality refers to a collective organization with full division of labor, including individuals who gather no food but are fed by others, or who are prepared to sacrifice themselves for the defense of others.

THREE PILLARS OF SUSTAINABILITY	The three pillars of sustainability are a powerful tool for defining the complete sustainability problem. This consists of at least the economic, social, and environmental pillars. If any one pillar is weak then the system as a whole is unsustainable.	

Instead of conclusion

How can sustainability and education for sustainability academics/researchers help education practitioners?

Often the relation between academics/researchers and education practitioners is actually non-existent, the lack of the exchange and communication *between the theory and practice* results in very complex outputs from academics and researches barely understandable to the practitioners. Moreover, over- complication generates over- simplification in practice that, in the case of education for sustainability, contributes to generating confusion and transmission of partial messages.

It is necessary to create a platform for exchange that would enhance publications, trainings and research on Sustainability topics that could be used by practitioners and revised (content-wise) by academics.

What we, as organizations, could do to help schools in implementation of Education for Sustainability?

Education for Sustainability is a major challenge for schools as it is about knowledge but also about values. The introduction of Education for Sustainability In schools requires structural changes.

NGOs and institutions dealing with education and directly working with schools can contribute to providing schools with Sustainability content within (but not limited to) existing forms of partnerships with schools:

- Introduction of the topic of Sustainability in the School Development Plan
- Providing trainings and workshops providing concrete teaching methods and classroom activities
- Create platforms of discussions involving parents and community members
- Raising awareness about the urgent issues related to Sustainability
- Empower school to develop sustainable program of extra-curricular activities
- Offer to schools continuing support and monitor the achievements

What we as civil society organization can do to advocate for implementation and correct interpretation of Education for Sustainability in education policy?

Education for Sustainability at policy level is often focused only on Environmental Education. The challenge of interpretation of EfS requires a holistic policy analysis involving education specialists and Sustainability experts. The policy recommendations, as the result of the process, should be further developed into strategic and action plans.

The role of NGOs could be fundamental as channels of communication able to translate the international discourse about EfS into national policies.

NEPC Members & Friends:

- Have a column in our institutional newspaper (raising awareness debates, translation of an important studies etc.) related to EfS;
- Try to introduce EfS in your existing Teachers Training modules, activities, projects - share English outline within the network
- Using ENjoinED methodology to analyze how EfS is reflected in curriculum and textbooks;

- Improving capacities of at least one employee who is going to coordinate activities related to EfS;
- Find out who is active and interested in the topic of EfS and invite/join them in discussions to have a common understanding of it; (pointing out issues, aspects missing, suggesting for broader aspects);
- To find out whether environmental NGO's are doing any educational activities and want to collaborate with our organization.
- Participating in the activities, advocacy and discussions around Education 2030 goals;

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