

Management for Sustainable Resources - Environmental Challenges

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Abstract: Human, in his stay on the planet, tormented by existential anguish, goes to and forth for having food and shelter, then more food and bigger shelters, fast and then faster vehicles, good medicines and more resistant to diseases, more productive animals and plants. Man has moved beyond the natural systems that had existed in equilibrium. Aware of his power, his intelligence, human prefers to forget that the struggle for survival is a game with zero sum, one survives on the other. Economic growth has become a religion: it solves many, but not the ethical dilemmas. Dilemmas, part of them have names: Global Warming, Overpopulation, Pollution, Climate Change, Natural Resource Depletion, Loss of Biodiversity, Deforestation, Ocean Acidification, Acid Rain, Ozone Layer Depletion, Water Pollution, Urban Sprawl, Public Health, Genetic Modification of Food.

Keywords: Healthy natural environment; Cascading effects Loss of Biodiversity; Deforestation; Global Warming

1. Introduction

A healthy natural environment is the fundament for sustainable running of all sectors. But it is not enough to raise awareness of this, it is necessary to implement appropriate policies and practices that will produce increasing effective effects in sustaining a healthy natural environment, in all vegetable and animal sectors, as well as for every individual.

“The continued over-exploitation of natural capital is an example for a slow failure in a highly inter-linked world.” The biggest risks may be from slow failures which

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unfold their full damage potential over decades. When risk sharing is distributed across a greater number of elements in the system, they can also lead to greater fragility.



Figure 1. Environmental Degradation

Source: https://www.conserve-energy-future.com/wpcontent/uploads/2014/11/Deforestation_environmental_concern.jpg

Failure in one critical link can have cascading effects, often as a consequence of decreased system diversity and governance gaps” (<https://www.eea.europa.eu/soer/synthesis/synthesis/chapter7.xhtml>).

Inappropriate industrial and agricultural practices and land use have a negative consequences on natural resources, due to pollution of soil, water and air.



Figure 2. Inappropriate Industrial

Source: https://www.conserve-energy-future.com/wpcontent/uploads/2013/06/Pollution_From_Industries.jp

Anyway, environmental objectives go beyond what we can expect industries and farmers to deliver by respecting compulsory legislation. However, we must understand that all those engage in actions to improve the environment, beyond the mandatory requirements need appropriate incentives be offered. These measures targeted

towards encouraging the provision of environmental services on a voluntary basis. (<https://www.eea.europa.eu/soer/synthesis/synthesis/chapter7.xhtml>)

But maybe it is not enough to put on the swing of this game with life aside huge forces, which destroy the environment in the name of the economic ideology, of the development and the “progress” having financial resources, logistical and being strongly motivated by the desire to always be on stage, always looking for pulling up the tip of the turnover line, and on the other side of the rocker, the volunteer force, maybe insufficiently coagulated and financed.

2. Materials and Methods

This is a synthesis paper, which aims to show the important role of every individual, company, Gouverne for life on Earth, for sustainable management of vegetal and animal resources. In this regard, a series of recent scientific studies were used, in order to emphasize all the main characteristics of environment stressors. The study was conducted based on the most significant synthesis, UN and EU reports. This study employed qualitative technique for examining connection between governance mechanisms, human and companies activities and environment depletion and reduction.

3. Results and Discussions-Major Environmental Problems on Tracks

Global Warming

Climate changes, now in XXI century “leads to rising temperatures of the oceans and the earth” surface causing melting of polar ice caps, rise in sea levels and also unnatural patterns of precipitation such as flash floods, excessive snow or desertification.”

(<https://www.eea.europa.eu/soer/synthesis/synthesis/chapter7.xhtml>)

If we talk about global warming in this century, then it is undoubtedly the result of the emission of Greenhouse gases and other intensive industrial and agricultural practices.

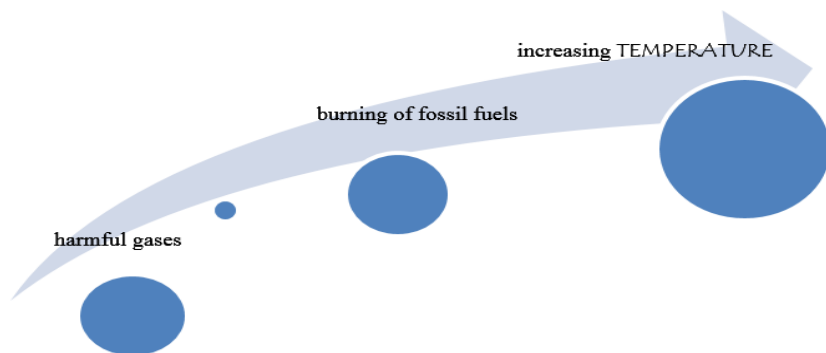


Figure 3. Climate Change

Climate Change

Climate changes due to burning of fossil fuels and release of noxious gases by plants another environmental problem become a challenge for humankind.

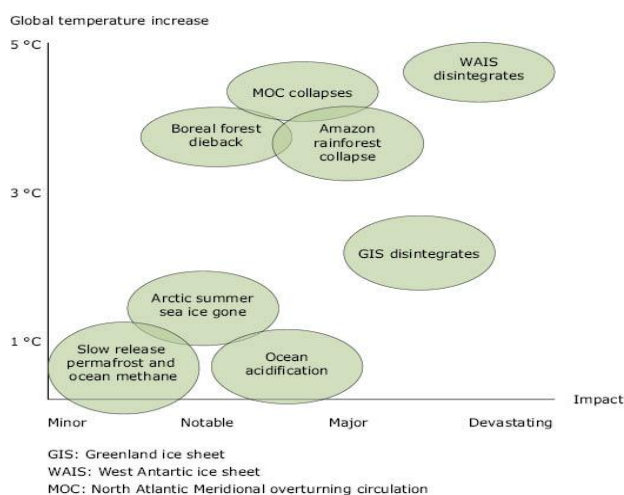


Figure 4. Estimated Global Warming Versus their Impact

Source: <https://www.eea.europa.eu/soer/synthesis/synthesis/chapter7.xhtml>

It prevail due to rise in global warming which occurs due to overtemperature of atmosphere by burning of fossil fuels and release of harmful gases by industries.

Climate change produces harmful effects but such as change in overall weather scenario, change in seasons, melting of polar ice, occurrence of new diseases, frequent occurrence of floods and.

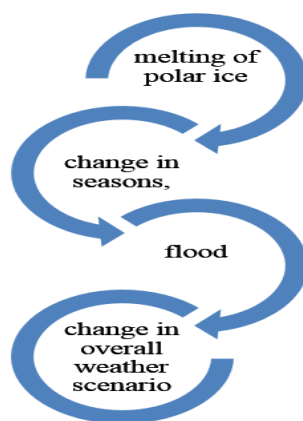


Figure 5. Various Harmful Effects Due to Climate Change

Pollution

Pollution of air, water and soil require millions of years to recoup.

Industry, agriculture and motor vehicle exhaust are the number one pollutants. (<https://www.eea.europa.eu/soer/synthesis/synthesis/chapter7.xhtml>)

Table 1. Pollutants-Toxins Responsible for Pollution

water pollution	air pollution	soil pollution
plastic	gases	essential nutrients used by agriculture
heavy metals	toxins released by industries	Industrial Waste
nitrates	combustion of fossil fuels	
oil spill		
acid rain		
urban runoff		

Overpopulation

Increasing the number of population is another one of the environmental problem.

Roughly 83 million people are added to the world's population each year, according to the UN. World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100 according to the naturalist David Attenborough.

(<https://www.eea.europa.eu/soer/synthesis/synthesis/chapter7.xhtml>)

The chemical insecticides, fertilizer, pesticides used by intensive agriculture to produce more food for this huge population produce damages the environment through use of them.

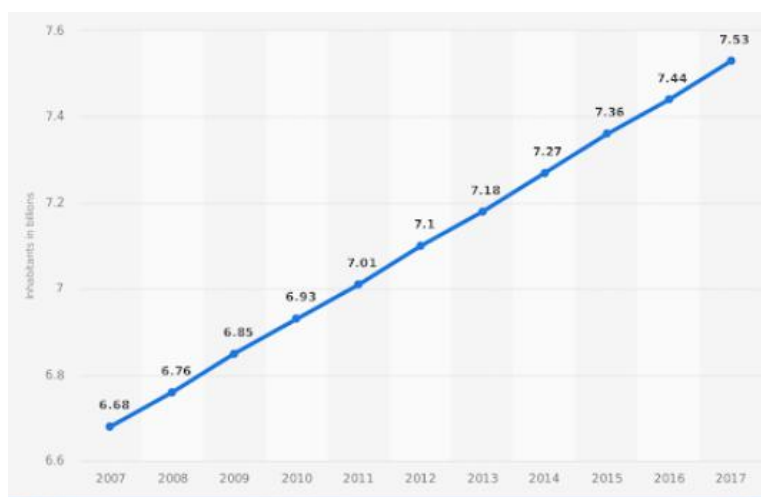


Figure 6. Total Population from 2007 to 2017 in Billion Inhabitants

Source: Statista World Bank

The population of the planet is on an unsustainable levels as it does not cope with shortage of resources: water, food, fresh air and fuel. In order to feed a growing number of people, the identified solution until now was to practice intensive agriculture but it is getting with an unwanted result.

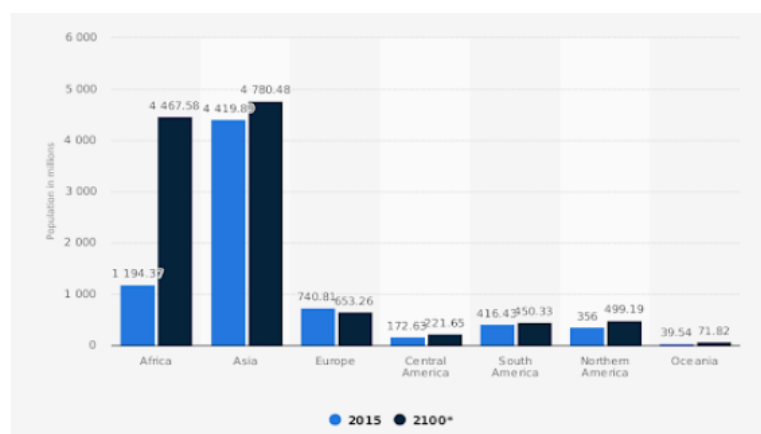


Figure 7. Forecast of the World Population for 2100 by Continent

Source Statista World Bank

Natural Resource Depletion

Natural resource depletion is another environmental problems. As studies reveals, fossil fuel consumption is responsible for global warming and climate change.

According with *the world counts* (<https://www.theworldcounts.com/stories/Depletion-of-Natural-Resources>) resources are in decline as follows:

Coal – “Peak coal extraction is predicted between 2025 and 2048. In 2011, it was estimated that we have enough coal to meet global demands for 188 years. If the demand increases, the timeframe will decrease.” (<https://www.theworldcounts.com/stories/Depletion-of-Natural-Resources>)

Natural Gas – “As of 2010, the known reserves of natural gas was estimated to last 58.6 years with the current global production.” (<https://www.theworldcounts.com/stories/Depletion-of-Natural-Resources>)

Water – “... by 2025, 1.8 billion people will have no water to drink.” (The Food and Agriculture Organization of the United Nations)

As Globally identified solution, economic policies for the implementation of renewable sources of energy such as solar, wind, biogas and geothermal energy are developed. The cost of installing the infrastructure and maintaining it becomes affordable.

Loss of Biodiversity

Along an evolution of 70,000 years, man, only humankind has brought to the planet's ecosystems changes that had never been made before. Increasingly given the new and performant technology, the economic motivations, now we are witnesses how human activity are leading to the extinction of species and habitats and the loss of bio-diversity. Eco systems, which took millions of years to perfect, are in danger and thounds and thounds of species or entire populations are decimating. The destruction of coral reefs in the various oceans, which support the rich marine life. Unfortunately, human activity threatens planet life in his core: the balance of natural processes like pollination which is a crucial one to the survival of the ecosystem.

Deforestation

Trees produce fresh oxygen as well as helps in regulating temperature and rain fall.

According with Earth Policy Institute (http://www.earth-policy.org/indicators/C56/forests_2012) forests cover 4 billions ha, representing 31% of the world s land surface. But “As forest expansion remained stable, the global net forest loss between 2000 and 2010 was 5.2 million hectares per year.”

World Forest Cover, 1990-2010			
Region	Total Forest Cover		
	1990	2000	2010
Million Hectares			
Africa	749	709	674
Asia	576	570	593
Europe	989	998	1,005
North and Central America	708	705	705
Oceania	199	198	191
South America	946	904	864
World	4,168	4,085	4,033

Source: Compiled by Earth Policy Institute from U.N. Food and Agriculture Organization, **Forest Resources Assessment 2010: Global Tables** (Rome, 2010), www.fao.org/forestry/fra/fra2010/en/.

Figure 7. World Forest Cover, 1990-2010

Source: http://www.earth-policy.org/indicators/C56/forests_2012

According..with all above and with <https://www.eea.europa.eu/soer/synthesis> nowadays forests cover 0,3 of the land but every year tree cover is lost amounting 11.670,92 km² due to growing population demand for more food, housing and not only. Deforestation nearly means clearing of “ozon plant” and make that land available for residential, industrial or commercial purpose.

Waste Disposal

It seems that modern man has projected on a planetary scale, but especially in developed countries, a huge “waste factory”. The over consumption of resources and uses of plastics are creating a global crisis of waste disposal. Developed countries produce a huge amount of waste or garbage and unloading their waste in the oceans and /or send it to less developed countries.

On the other hand, nuclear waste elimination has tremendous health risks associated with it. Plastic, electronic wastes, packaging threaten the well being of humans. Waste disposal is one of the highest environmental problem.

Ocean Acidification

“It is a direct impact of excessive production of CO2. 25% of CO2 produced by humans.

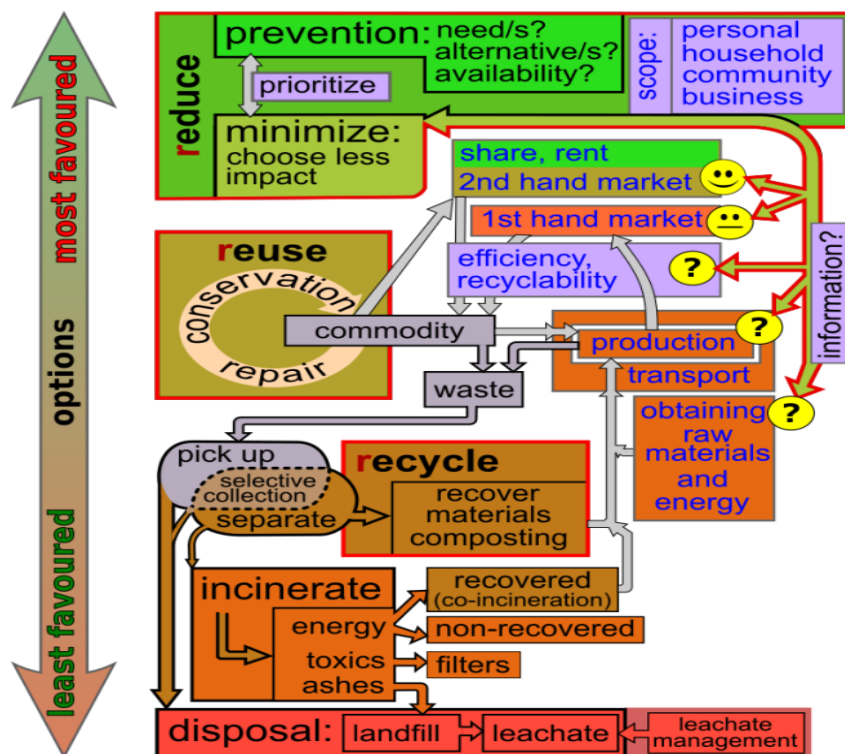


Figure 8. Waste Hierarchy

Source: https://en.wikipedia.org/wiki/Waste_management#/media/File:Waste_hierarchy_rect-en.svg.

The ocean acidity has increased by the last 250 years but by 2100, it may shoot up by 150%. The main impact is on shellfish and plankton in the same way as human osteoporosis.” (<https://www.eea.europa.eu/soer/synthesis>).

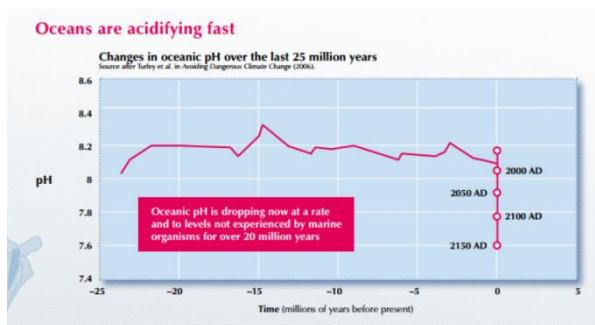


Figure 9. Ocean ACIDIFICATION

Source: <https://www.iucn.org/resources/issues-briefs/ocean-acidification>

Acid Rain

Human health, wildlife and aquatic species for sure will be effected on by what is called “acid rain”.

The severity of future ocean acidification depends on the scale of future CO₂ emissions, shown here for the four IPCC pathways: RCP 2.6, lowest emissions (atmospheric CO₂ at ~421ppm in 2100); RCP 6.0, low emissions (~538ppm); moderate emissions (~670ppm); and RCP 8.5, high emissions (~936ppm). After Bopp et al. 2013.

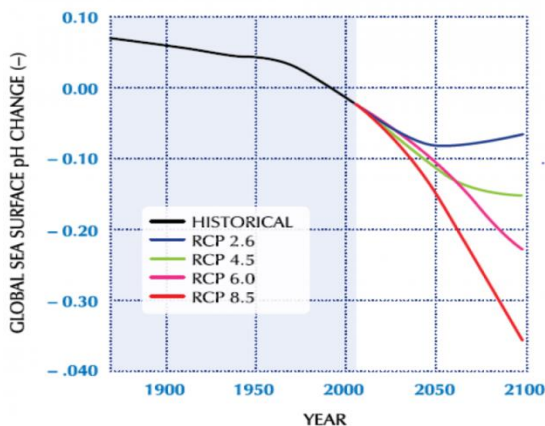


Figure 9. Ocean Adicification Depends on the Scale of the Future Emission of CO₂

Source <https://www.iucn.org/resources/issues-briefs/ocean-acidification>

Acid rain occurs due to the presence of certain pollutants in the atmosphere. This is provoked by combustion of fossil fuels, of rotting vegetation, which release sulfur dioxide (SO₂) and nitrogen oxides (NO_x) into the atmosphere.

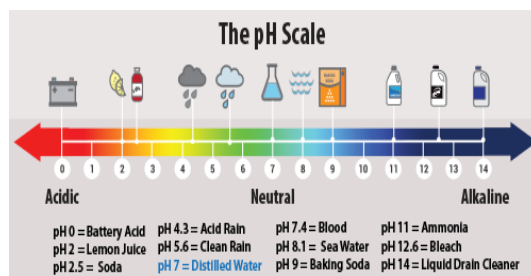


Figure 10. Substances on the pH Scale

Source <https://www.epa.gov/acidrain/what-acid-rain>

Ozone Layer Depletion

The most important current environmental problem is depletion of the Ozone layer of the atmosphere which is valuable because it prevents harmful UV radiation from reaching the earth. This is attributed to pollution caused by Chlorine (Cl) and Bromide found in Chloro-floro carbons (CFC’s).

“These toxic gases reach the upper atmosphere and cause a hole in the ozone layer, “the biggest of which is above the Antarctic.”(<https://www.eea.europa.eu/soer/synthesis>)

The CFC’s are banned in many industries and consumer products.

Although it’s true that we cannot physically stop our ozone layer from thinning and scientists are still having trouble figuring out what is causing it exactly. (<https://www.eea.europa.eu/soer/synthesis>)

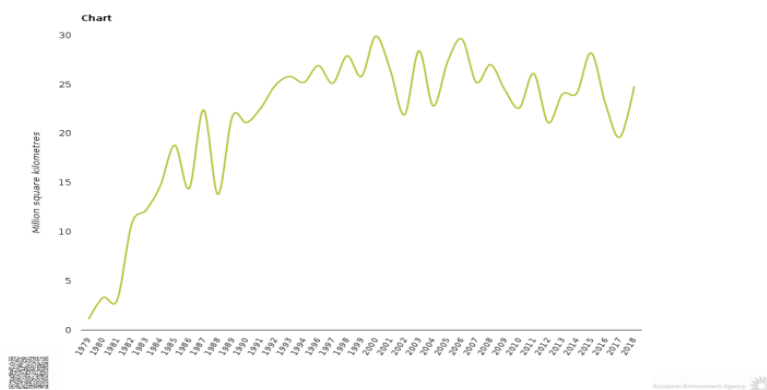


Figure 11. The Chart Below Shows the Development of the (Annual Maximum) Size of the Ozone Hole Over the Antarctic

Source: European Environment Agency

Water Pollution

Due to industrial development rivers seas and oceans are affecting by toxic pollutants.



Figure 12. Industrial Development Rivers Seas and Oceans are Affecting by Toxic Pollutants

Source <https://www.nrdc.org/stories/water-pollution-everything-you-need-know>

Water is becoming an economic and political issue as the human population fights for this resource. Because clean water is becoming a rare utility, one of the identified resolution should be using desalinized water.

Urban Extend

Urban sprawl refers to migration of population from high density urban areas to low density rural areas which results in spreading of city over more and more agro land. Urban extend results in land degradation, increased traffic, environmental issues and health issues. The ever growing demand of land replace natural environment consisting of flora and fauna instead of being reinstate. (<https://www.eea.europa.eu/soer/synthesis>).

Public Health

Due to environmental disasters the health of all beings, be they humans or animals poses a great risk. Polluted air, water infested with heavy metals, plastic and other substances are all health risk of the world and present menace to the quality of public health. “ Run-off to rivers carries along toxins, chemicals and disease carrying organisms.” (<https://www.eea.europa.eu/soer/synthesis>)

Genetic Modification of Food

Genetic engineering uses biotechnology producing genetic modification of food. “Genetic modification of food results in increased toxins and diseases as genes from an allergic plant can transfer to target plant.” [6] So modified crops, due to increased use of toxins to make insect resistant plant can cause serious environmental problems and cause resultant organisms resistant to antibiotics. Another negative aspect is that engineered gene may prove toxic to wildlife.

(<https://www.eea.europa.eu/soer/synthesis>)

4. Conclusions

The need for change in our daily lives is growing. Because so many different factors come into play, many people don't consider that what they do will affect future generations. If humans continue moving forward in such a harmful way towards the future, then “there will be no future to consider”. There are still so many things it can do to try and put a dent in what we already know. By raising awareness in local community about these issues it can be helpfully to a more sustainable and healthy environmentally and in the same time a more friendly place for live.

But is not enough!

There must be coherent policies that apply to all those involved

References

https://ec.europa.eu/info/food-farming-fisheries/sustainability-and-natural-resources/agriculture-and-environment/cap-and-environment_ro.

<https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html>.

<https://www.eea.europa.eu/soer/synthesis/synthesis/chapter7.xhtml>.

<https://www.weforum.org/agenda/2018/10/david-attenborough-warns-planet-cant-cope-with-overpopulation/>.

<https://www.theworldcounts.com/stories/Depletion-of-Natural-Resources>.

<https://www.eea.europa.eu/soer/synthesis>.

https://www.earth-policy.org/indicators/C56/forests_2012.

https://en.wikipedia.org/wiki/Waste_management#/media/File:Waste_hierahier_rect-en.svg.

[https://www.iucn.org/resources/issues-briefs/ocean-acidification.](https://www.iucn.org/resources/issues-briefs/ocean-acidification)

[https://www.epa.gov/acidrain/what-acid-rain.](https://www.epa.gov/acidrain/what-acid-rain)

[https://ec.europa.eu/clima/policies/ozone_en.](https://ec.europa.eu/clima/policies/ozone_en)

European Environment Agency.

[https://www.nrdc.org/stories/water-pollution-everything-you-need-know.](https://www.nrdc.org/stories/water-pollution-everything-you-need-know)