Chapter 3

Environmental protection and countries' problems deciding on how to manage conservation

Introduction

Environment is becoming an important national and transnational issue. It has been ages since our land cover has undergone a process of transformation which involves anyone, any inhabitant of the globe who also unconsciously is facing increasingly hard problems which are compromising or better have compromised our environment and environmental security

Are we aware of what is going on? Are we aware of environmental problems? Do we still think that pollution is the only problem we are facing? Do we realize that our lives and the future generations' lives are at stake?

Leading examples of emerging environmental changes are: depletion and pollution of fresh water, depletion of fisheries, degradation and disappearance of biodiversity, loss of agriculture lands, food and health safety, stratospheric ozone depletion, and global warming, climate changes just to name few. But what are they? What do they mean?

The EU has been at the forefront of international efforts towards a global climate deal.

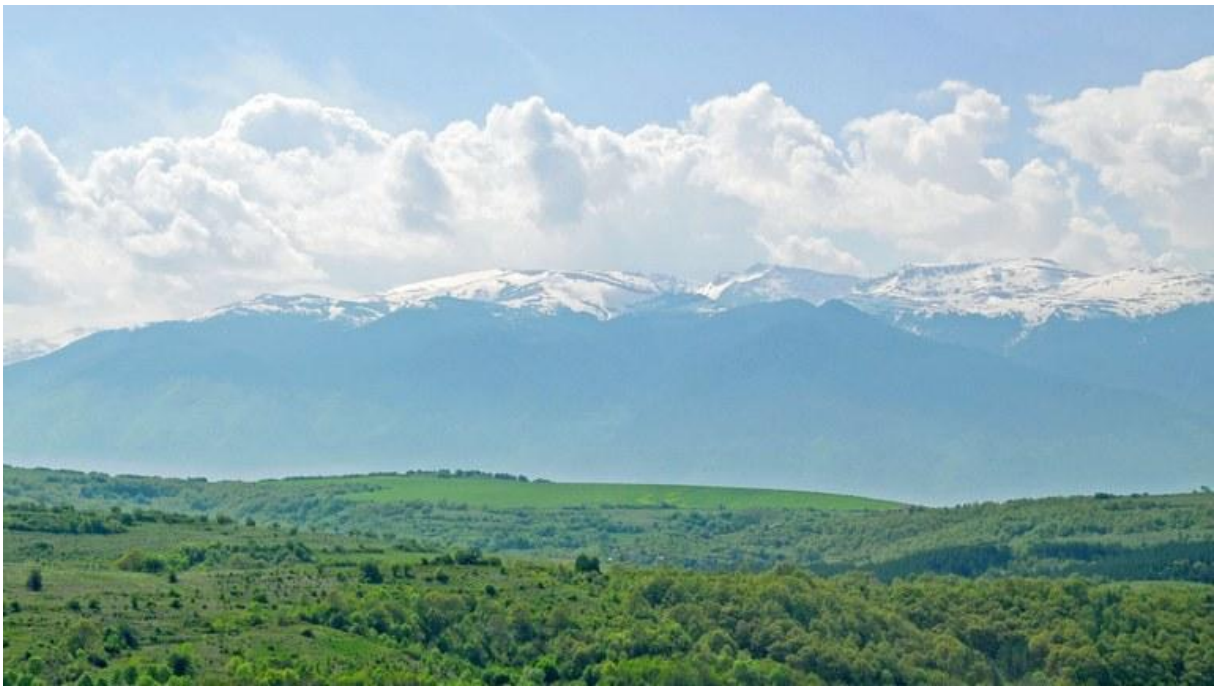
Following limited participation in the Kyoto Protocol and the lack of agreement in Copenhagen in 2009, the EU has been building a broad coalition of developed and developing countries in favour of high ambition that shaped the successful outcome of the Paris conference.

The EU was the first major economy to submit its intended contribution to the new agreement in March 2015. It is already taking steps to implement its target to reduce emissions by at least 40% by 2030.

Prof.ssa Romaniello Rosalba
Prof.ssa Palese Assunta Maria
IC Satriano di Lucania (PZ) ITALY

Environmental protection in Bulgaria

4.1 Environmental protection and countries' problems deciding on how to manage conservation



4.2 Main policy responses to key environmental challenges and concerns

In Bulgaria emphasis is increasingly placed on national environmental protection and the prevention and adaptation to climate change. The main legislative initiatives intending to increase the efficiency of the governance of environmental policies and to improve the business environment are:

- draft amendments to the Protected Areas Act, Medical Plants Act and Biodiversity Act, to reduce the regulatory and administrative burden of regulatory regimes in relation to biodiversity conservation.
- proposal for amendments to the Water Act, which mainly aims at accelerating the process of determining the sanitary - protective zones around water intake facilities for drinking water, full harmonization of the framework for Community action in the field of water policy and implementation of new higher environmental standards for water.

- Amendment to the Law on the responsibility to prevent and remedy environmental damage, which are included in the Draft Law amending the Law on Genetically Modified Organisms in order to ensure effective control over the prevention and remedying of environmental damage.
- A new Waste Management Act, which updates the requirements for waste management and establishes national targets for recycling of household and construction waste.

4.3 Air quality - problems and measures to improve it

The quality of the air we breathe affects our health and lives.

Economic activities related to road traffic, electricity and heat generation, industry and agriculture are a major source of air pollution. To improve air quality in the future, the use of "green" and more efficient technologies as regards the thermal insulation of buildings as well as the use of alternative fuel sources in households and transport, use of the best available technologies in the industry and others.

Few years ago municipalities with public transport and especially Sofia started to buy more and more busses working with natural gas. Hopefully, at some point, all the busses will be changed soon.

4.4 Water management and water quality

Conservation of the quality of natural and drinking water is a primary task of society in order to guarantee the health of living for the individual and a high standard of public health.

Compared to other European countries, Bulgaria is characterized by relatively significant fresh water resources, both in absolute terms and per capita.Water resources in Bulgaria are predominantly formed by external inflows and are unevenly distributed throughout the country. Fresh water resources in Bulgaria are about 14 thousand m 3 / yr. average per person who places the country among the top 10 European countries. Nevertheless, certain areas of the country may experience water shortages due to the uneven territorial distribution of resources. Bulgaria is among the European countries with high levels of seized water per person on average due to the significant volumes required for cooling. At the same time, water abstraction in Bulgaria does not cause stress on the aquatic ecosystem.

The amount of waste and cooling water generated by economic activities follows the level of consumption. On average, about 79% of the total water used for the economy (2000-2013) is taken to water bodies or public sewers. Improvement of the level of purification - in 2005, 56% of the wastewater discharged into water bodies was treated with at least secondary methods and 66% in 2013. Public sewerage in the country is predominantly mixed and collects both industrial, domestic and rainwater. The share of the population connected with waste water stations is highest in the Black Sea and Danube basin districts - with predominantly secondary and tertiary purification. Compared to 2012, water bodies in the "bad" category are 4 times less (8 in 2012 and 3 in 2013). Medium-term trends during the period 2006-2013 show a relative improvement in the state of the coastal seas.

4.5 Biodiversity. National Ecological Network

One of the most critical environmental threats on a global scale is the loss of biodiversity. Under the influence of predominantly human activities, species nowadays disappear from 100 to 1000 times faster than normal. In the last decades, almost all ecosystems have been affected by a number of negative factors such as habitat destruction, pollution, over-exploitation and climate change.

To provide food and water and to reduce the risk of disasters, biodiversity is a powerful engine that underpins the current and future sustainability goals.

Bulgaria is a member of the Convention on Biological Diversity (CBD) since 1996 and the MOEW biodiversity policy is related to the implementation of its three objectives - conservation, sustainable use of biodiversity and access and equal distribution of the benefits of genetic resources.

There is an example of a cosmetic company that raised a fund to “adopt” a forest. The company pays the owners of the parcel the amount of money they would earn by cutting the trees and selling them and in return they take the responsibility not to allow ruining the forest and its habitants.

There are at least two active campaigns for planting more trees. The first is called “When we get 100 000 we’ll plant a forest” and is organized as a photo competition between schools all over Bulgaria. Each photo collects votes and receives a hundred trees to plant. The second one is a Sofia municipality campaign for volunteers to plant trees around the city.

4.6 Waste and material resources

Waste is seen as an environmental, social and economic problem, and growing consumption and "consumer" behavior continue to produce large quantities of waste. The reality is that

large and diverse efforts are needed to prevent them from forming. Waste is also a waste of material resources (through metals and other recyclable materials), and at the same time have potential as energy sources. The waste management challenge is great, but the answer can be found in reuse and recycling! The implementation of these waste treatment activities are environmental friendly, leading to diversion of waste from landfills, thereby reducing polluting emissions, providing opportunities for economic and social benefits: generating economic growth, promoting innovation, creating jobs places, and help ensure the availability of critical resources.

A positive trend towards improved waste management practices is maintained in 2014, achieving national targets for municipal waste recycling, recovery and recycling of packaging waste, and last but not least, the recycling targets for widespread waste (EEA, "SOER-Synthesis2015").

A waste for one is a treasure for another! A lot of people like to use second hand stuff. There are many shops for second hand clothes where people like to search for “treasures” that are cheaper and often one of a kind. You can find groups in the social platforms where people exchange stuff or trade them at lower price or just give them as a gift for people in need. There are some containers on the streets where you can put useful old clothes for someone that will need them.

My food is your food! There were some Help corners around Sofia, where people can put food in public out-of-door fridges for people in need round-the-clock. The food can be bought or from your own fridge. A group of young people initiated this activity when seeing how much food is getting wasted every day.

4.7 Eco tourism

Vazov's eco path

Ecotourism is now defined as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" (TIES, 2015). Education is meant to be inclusive of both staff and guests.

It is about *uniting conservation, communities, and sustainable travel*. This means that those who implement, participate in and market ecotourism activities should adopt the following ecotourism principles:

- Minimize physical, social, behavioral, and psychological impacts.
- Build environmental and cultural awareness and respect.
- Provide positive experiences for both visitors and hosts.
- Provide direct financial benefits for conservation.
- Generate financial benefits for both local people and private industry.
- Deliver memorable interpretative experiences to visitors that help raise sensitivity to host countries' political, environmental, and social climates.
- Design, construct and operate low-impact facilities.
- Recognize the rights and spiritual beliefs of the Indigenous People in your community and work in partnership with them to create empowerment.

Bulgaria is familiar with this kind of tourism for about 10 – 15 years. There is a tendency to prefer a "village' or "eco" way of exploring the country. According to Ecotourism magazine, there are many different opportunities to practice it – mountain transitions and hiking, photo

tourism, observation of birds and many more. On the Bulgarian territory of 111 000 m^2 there are 3 national parks, 11 natural parks, 89 wildlife sanctuaries, over 2 200 natural landmarks and 37 000 km marked eco paths. When visiting, you can stay in a family hotel in a small village or to choose between numerous eco or green hotels.

An ecological hotel is one that is fully integrated into the environment without damaging the environment, contributing in some way to progress and improvement of the local community and sustainable growth of the tourism industry. ***We can only hope they really deserved the quality sign!***


Omaya Eco Village

4.8 Energy Strategy of Bulgaria by 2020

Bulgaria's energy strategy is the main strategic document at national level. The starting point for the development of the strategy is a European energy policy that targets sustainable energy development and its achievement is linked to long-term quantitative targets by 2020:

- 20% reduction in greenhouse gas emissions compared to 1990;
- 20% share of RES, incl. 10% share of biofuels in transport;
- Improve energy efficiency by 20%.

The results for the fulfillment of the national target under Directive 2006/32 / EC show that the country is currently over-performing the conditional target by 1%.

Year	2005	2006	2007	2008	2009	2010	2011	2012
RE ktoe (normalized)	1048	1118	1067	1183	1205	1429	1515	1680
RE share from total energy, %	9.54	9.74	9.43	10.72	12.44	14.40	16.64	16.34

4.9 Country specific issues

National objectives in line with the "Europe 2020" strategy"

"Europe 2020" strategy objectives	Present situation	Objectives of the National reforms program 2020[7]
3% of the GDP of EU goes for investment in scientific and research and development activities	0.6% (2012)	Increase up to 1.5%
20% decrease of GHG emissions compared to 1990 levels	minus 12% (prognosis for emissions in 2020[8] given 2005=100)	Increase with 20% max for sectors outside the ETS[9] (given 2005=100)
	plus 11% (emissions in 2010 given 2005=100)	
20% share of the RES in final energy consumption (incl.10% RES in the end consumption in transport)	16.4% (2012)	Increase the share to 16%
20% increase of the energy efficiency	17.4[10] Mtoe (2010)	Decrease with 3,2 Mtoe=15,8 Mtoe
75% employment of the population aged 20-64	63.5 (2013)	Increase the employment to 76%
Under 10% share of the early school leavers	12.4% (2013)	Decrease the share to 11%
At least 40% share of the aged 30-34 completed university	29.1% (2013)	Increase the share to 36%
Reducing the number of people living at risk of poverty or exclusion with 20 million	41.6% of the population	Decrease with 260,000

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- *Executive Environment Agency - Bulgaria*

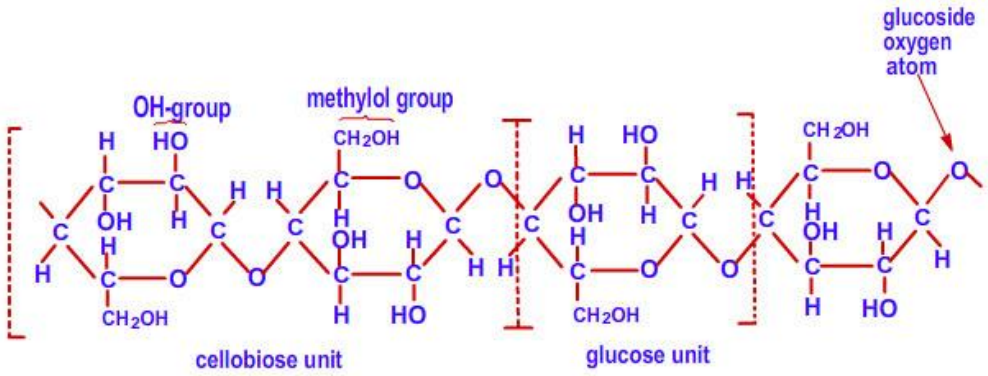
Environmental protection in Finland

5.1 Replacing cotton with synthetic fibers

Aleksander Heino

When thinking in terms of efficiently using space and water, cotton is one of the worst things that you can dream of: It uses enormous amount of water and needs a ton of space to grow. That is the main reason for the growth of synthetic fiber industry. Synthetic fibers can be made tx. by using cellulose as the main starting component of the fiber. This is done by means of splitting the straight chain polymers of cellulose into smaller parts, and then later extruding them into components with the chain length and properties we need.

The structural formula of cellulose

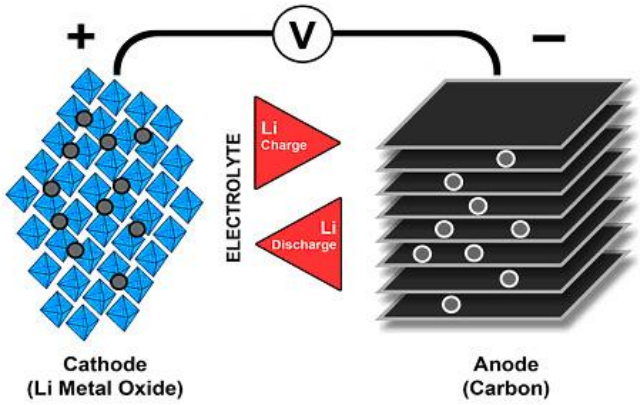


source (http://nptel.ac.in/courses/116102026/6)

5.2 Can electric cars save the planet?

The most commonly used batteries in the electric car industry are lithium-ion batteries, and if one compares just the middle of battery's lifespan with gasoline, battery will win every time, but the problem starts to creep in when we talk about producing and recycling lithium-ion batteries: those things are not as environmentally friendly as we would want them to be, this is mainly because lithium is a toxic alkali metal. But even though there may be some problems with recycling lithium-ion batteries, this industry has much more to offer and has better future perspectives than the dying out industries of fossil fuels and internal combustion engines.

Simplified version demonstrating the main principle of li-ion batteries



source (http://batteryuniversity.com/learn/archive/understanding_lithium_ion)
source(http://nptel.ac.in/courses/116102026/6)

Utsab Pokharel and Joel Tenhunen

5.3 Recycling

In Finland you can recycle pretty much anything; biowaste, plastics, bottles and cans, paper, cardboard, glass, electronics and metal. You can usually find recycling centers near supermarkets and malls. Every apartment building these days has a sorted dumpster where you can sort your trash. These, however, do not always have the option to sort plastics or electronics so if you want to them you might have to take them to a recycling center.

You can also recycle your clothes and other usable items you do not need in recycle centers

https://www.kierratyskeskus.fi/myymalat_ja_palvelut/itakeskuksen_kauppa

Minttu Heiskanen

5.4 Recycling clothes

In Finland, recycling is working good and it is made as easy as possible to all citizens. What comes to clothes, it isn't hard at all to recycle useless pieces. For example chain store H&M receives useless clothes and other textiles. In return service they give you a discount voucher. I think that this is very useful system, and it should be used more. All those big chain stores have enough authority to make clothing recycling even more powerful. If you don’t want to take your clothes or other useful textile pieces to stores, you can always go through the easiest way and take them to nearest recycling point. For example in Helsinki, there are recycling points basically everywhere. In the center of Helsinki, recycling points are more unusual than in suburb areas. Most of collected clothes end up to Africa, to reuse. Those clothes, that can no longer be in use become waste.

Beside options above, in Finland and especially in Helsinki we like to exploit flea markets and second hand stores. Every fashion-conscious teenager knows exactly where to shop and find bargains and vintage clothes.

How you can save energy and resources on a daily basis

Vinski Pyykönen

Everyday in our lives we find ourselves in situations where we can save energy. They usually are really mondaine things to us so we usually don’t even pay attention to them. However if you learn to spot these opportunities where you have the ability to make the decision of saving energy, you can reduce your own carbon footprint immensely! And in the end it doesn’t take much of your time so why wouldn’t you ?

Well now you are probably asking what do I need to do to reduce my carbon footprint ? Most of the times you have the opportunity to save energy and resources happen when you are just

living your normal live and doing normal things. Good example of situation like this is showering. Most of us go to shower every day. While we are cleansing ourselves, we have multiple opportunities to save some water and energy. For example next time you are in the shower ask yourself these questions. Do you leave the water running while you are applying shampoo to your hair ? Does your water need to be steaming hot ? Should you even shower everyday ?

We make these kind of decisions every day. These are situations where we know how to act because they are mondaine, but that's the problem. Because these situations are so normal to us we are on autopilot and we don't think about or actions and that's we miss the opportunity to have an influence to lives. Good thing for us is that we can make a change without needing to do much. All we have to do is make a mental note to ourselves and think more when we face these situations. If we all do this we can have an enormous impact together.

5.5 How to eat in an ecological way

Siri Hetta

In Finland, our daily food regimen contains more and more vegetables each year. Being a vegetarian is not just a hippie's trend anymore, it's getting pretty casual here. Most of the restaurants also have a vegetarian menu, and there's a lot of vegetarian restaurants. And before we continue, I just want to make clear that a vegetarian and a vegan is not the same thing. Vegetarians don't eat the body parts of any animals, but they might eat dairy products or eggs. Like vegetarians, vegans don't eat any animal flesh but they won't eat any dairy products or eggs either.

Choosing organic food over cheaper, but not finnish food is actually pretty wise. Just because organic food is more expensive, doesn't mean it's just a way to make more money. Organic agriculture actually employs our own citizens and the money doesn't just leave the country. It's also a lot fresher to eat something that comes from your own country! There's also savings in transportation since it doesn't come from across the country it's more friendly for our environment when the distance is not huge.

And besides, vegetarian diet is actually very versatile because it contains lots of protein and vitamins! If I could, I would challenge every single person in living and breathing in this world to try the one week vegan challenge and see the changes in their body and mind themselves.

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5.6 Waste processing in Finland

Kuura Aunola

In Finland waste processing is controlled by the ministry of environment, there is many regulations about how waste should be processed or recycled. The common regulations affect every kind of waste, except special and nuclear waste that has it’s own laws and regulations. The base of every regulation and law is “jätelainsäädäntö” which is a legislation about waste overall. The legislation has 4 points that are the foundation to all other waste policy.

-Preventing the waste and waste management's harms to health and environment.

-Reduce the amount of harmfulness of waste.

-Support the sustainable use of natural resources.

-To ensure effective waste management and to prevent littering.

The finnish legislation follows the European union waste management regulations, but is in some cases stricter.

The latest changes to the laws were made in 2011, the new law replaced the old one made in 1993. When nuclear energy is being made, it produces different types of waste. Nuclear waste is

Environmental protection in France

6.1 Introduction

In France, different ways exist to protect our environment and this section describes how French people manage it.

6.2 Environmental groups and protection

- Velorution

Combine “Vélo”and “Revolution”, and you get Vélorution, a group that promotes cycling to cut down on pollution and congestion in the cities. They lobby for better bike lanes, bike parking, etc, and organize many events in the city throughout the year.

- Greenpeace France

You’ve probably seen the Greenpeace folks out and about in Paris in their green jackets trying to sign up new members. I was walking the dogs when they swooped in on me, and after giving them a good grilling on their current activities in France (which include lobbying against genetically-modified crops, nuclear energy, questionable toxic waste dumping in developing countries, and climate change).

- Réseau action climat France

This group covers the issue of Climate Change, with publications, the latest news, and events happening throughout France.

- Les Amis de la Terre

How can you not like a group called “Friends of the Earth”? Sounds so friendly, doesn’t it? They’re active in issues such as climate change, forest protection, nuclear and fossil fuel alternatives, lobbying against genetically-modified crops, and sustainable lifestyle practices

- Agir pour l'Environnement

This environmental lobby group is currently focusing its efforts on banning the exportation of nuclear energy (because they’ll be building power lines through the Alps and the Pyrenees), against genetically-modified foods, and banning motorized vehicles like ATVs and snow mobiles from nature reserves.

- Protection

As a member of the European Union, France is trying to change resource usage and production habits and to reduce environmental concerns. Many national and territorial action plans are being carried out to reduce emissions of pollution into water. In particular, the country’s Ecophyto action plan and designation of nitrate vulnerable zones are leading to transformations in agricultural practices. In addition, wastewater treatment plants are being improved via infrastructure programs.

French policies have also started supporting growth and development of environmentally-friendly businesses, including support for R&D and clean technology. The proportion of environmental training is also contributing to a fast integration of ecological issues into the economy. Since 2004, the amount of environment-related jobs has jumped by 36 percent.

6.3 Eco construction and innovation

Eco-building/Eco-construction or sustainable construction is the creation, restoration, renovation or rehabilitation of a building, enabling it to respect ecology at every stage of construction and, later, its use (heating, consumption energy, rejection of various flows: water, waste).Eco friendly buildings can range from the extreme, where everything is green

with even the toilet water recycled, through those where the fabric of the building is built from natural, sustainable materials such as straw bales and lime plaster, to those that simply incorporate small but effective changes.

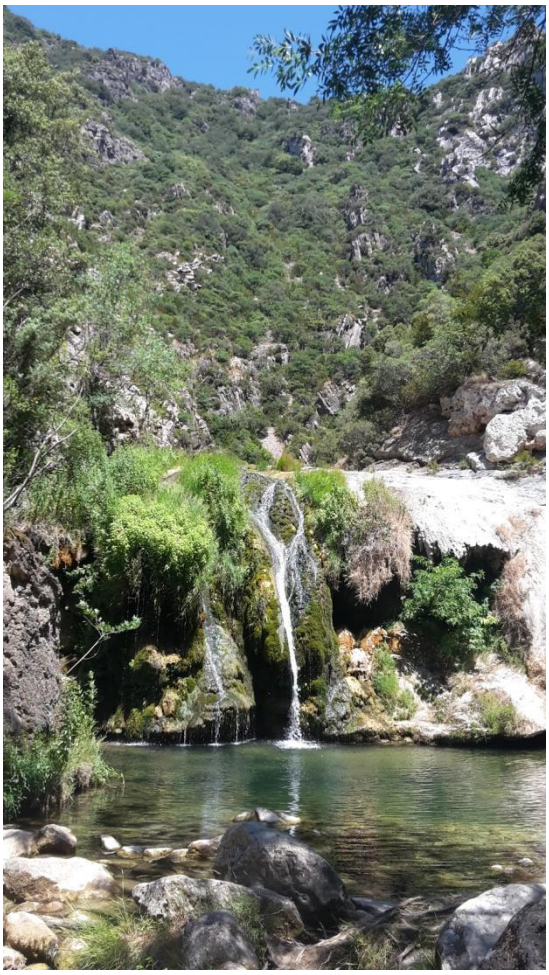
However green you want to be, there is something that you can do towards a healthier future for this planet, and probably improve your own standard of living as you do so.

There are many companies now in France that specialise in alternative energy, eco friendly and green technology, We want to build a France fuelled by renewable energies, less dependent on oil and gas.

This is the first eco-district of Ile-de-France which was built on the banks of the Seine, in Issy-les-Moulineaux,. It is located on a former industrial wasteland.

6.4 Eco tourism

Ecotourism is very trendy all over the world. This sustainable tourism is really a growing activity in France. Eco-friendly tourism has been developed a lot in the country for the last 10 years. What about spending your holidays in the nature this year?



What is Ecotourism?

Ecotourism is a kind of tourism, which is more turned towards nature and ecology. This responsible tourism has been developed in France when people realized that tourism did not

only have beneficial effects but, on the contrary, caused an important environmental pollution.

Respect is the key attitude to adopt while doing ecotourism: respect towards human beings, environment and the local culture.

6.5 Repair café

The repair cafe is an opportunity to repair or to have repaired together objects, by learning, rather than to throw. Or buy back ; small devices household electrical appliances, clothes, computing objects... And quite different easily transportable objects.

This project is to create and to co-create workshops in all the districts of the capital. We have already realized more than 25 Repair Café, in five districts, often with partner associations.

6.6 Local farmers/markets

In France, most of the country is used to produce all types of cultivable things like fruits, vegetables, wheat, basically everything you can farm. Due to that much products, farmers now sell by their own to customers, or in the food stores like Auchan or Grand Frais.

Of course products we can't cultivate in France are still being sold in those markets, but it is nice to buy and eat products coming from your country, because knowing that, you can deduce that meaning of transportations are less used than importing products from other countries, which is indeed way less polluting our atmosphere !

But, if for any reason you don't to buy those products, another solution exists in France! Nowadays, whenever a building is being built, the city lays out a place dedicated to farming for the habitants, so you can produce your own vegetables and fruits with some kind of community garden!

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Environmental protection in Italy

7.1 Introduction

As repeated several times in the previous chapters of this book, the Environment rescue can be achieved essentially at two levels: at macro level, by means of politic choices shared by the Governments of most Countries in the world and encoded by specific legislation at national and international level; at micro level, by the daily behavior of the single aware citizen. In this section, both these aspects will be treated. Particularly, some solutions/indications taken by the Italian Government and/or by the scientific Community will be examined considering their points of weakness and strength and their diffusion possibility on the territory, as well as how simply people can conscientiously use and save Earth resources during their daily routine.

7.2 How to manage at macro level

Save freshwater! One of the more impactful human activity on water reserves is agriculture which uses from 50 to 80% of the total water consumption. In addition, climate change will strongly affect worldwide water availability further reducing the already scarce conventional water sources. This is a problem of high concern in Italy, as Mediterranean Country, but in the future it could become a problem also for Countries located in more northern world areas. Alternative irrigation water should be found so dedicating the high-quality water to human consumption. The reuse of municipal wastewater for irrigation could be a realistic way of reducing water shortage, as it has been demonstrated in many countries in the Mediterranean region such as Israel, Cyprus, Jordan and Tunisia (Angelakis et al., 1999). In Italy the use of reclaimed wastewater is regulated by the Decree No. 185 12/06/2003 and following edits (Ministry for Environment). This last provides very stringent and precautionary hygiene parameters making the wastewater use not convenient due to the high costs of depuration processes. This is why in Italy wastewater is not used as water source for irrigation but it is reclaimed following the Legislative Decree No. 152 03/04/2006 which requires microbiological limits less stringent for the direct outpour of wastewater in surface water bodies. On the other hand, low-quality wastewater could be used with minimal health and environmental risk for the irrigation of specific crops chosen taking into account crops types (edible or not) and their human consumption (without or after processing), health hazards for risk groups (young, old, pregnant or immunocompromised consumers and operators such as farmers), water application technologies and the duration of the irrigation season (Palese et

al., 2009). This is the approach adopted by the World Health Organization (WHO) which recommends more liberal microbiological thresholds for unrestricted irrigation of crops to be eaten uncooked, sports fields and public parks, and no hygienic standards concerning restricted irrigation of cereals crops, industrial and fodder crops, pasture and trees (WHO, 1989). To prove this, a long-term study was carried out in an olive orchard located in Basilicata (40°29' N, 16°28' E - Ferrandina, Matera Province) confirming that urban wastewater, reclaimed by a pilot unit according to low-cost simplified schemes (hygiene parameters over the current Italian thresholds) can be used successfully for the safe irrigation of the olives, significantly decreasing depuration process costs (Palese et al., 2009; Palese et al., 2013).

Save the soil by feeding it!!! The excessive use of intensive agricultural techniques (mechanization, fertilization, pest and diseases control, inadequate irrigation, deforestation, burning, etc.) - occurred in the last decades - is leading towards an inexorable degradation of soils all over the world. Soil organic matter (SOM) content is a useful index to evaluate soil vitality. This soil component is fundamental to ensure soil fertility and crop productivity and, as consequence, people feeding. On the other hand, SOM in European Countries is nearby the threshold below which soil is considered irretrievably dead; this makes these Countries non virtuous because they deplete SOM instead to conserve it according to the indications of Kyoto Protocol. Therefore, it is urgent to adopt strategies to recover/maintain adequate SOM level to avoid serious harvesting crop decreases and to allow organic carbon sequestration in European soils as a potential tool for reducing Greenhouse Gases (GHG) emissions. European Union is going towards this direction. The Soil Thematic Strategy (COM 2006 231), preceded by a serious of EU Directives/Decision (Decision No 1600/2002/EC; COM(2002) 179; Directive 2004/35/EC), was specifically aimed at protect soil from different degradation forms, assure its sustainable use and reduce the detrimental effects of climate change. According to this Strategy, SOM decline is one of the major soil degradation processes/threats. In Italy, the current legislation on the so-called "soil defense" (Legislative Decree 152/06) essentially focuses on land protection from geological-hydraulic disasters rather than on the conservation of soil resource. Specific standards on good agricultural and environmental condition of land - designed to maintain soil organic matter level and soil structure - are indicated by the Common Agriculture Policy (CAP) for Italy and the other EU Countries within the cross-compliance system and specifically destined to farmers receiving CAP payments. The provision of organic materials may be a useful strategy to

conserve/increase soil organic matter level and maintain/enhance soil fertility. An adequate source of organic materials is compost which is a stable humus-like product, generally rich in carbon and free of most pathogens and weed seeds. It is useful as soil amendment but also for plant diseases control when applied as compost extracts (the so-called compost tea) (Pane et al., 2016). It derives from the processing of organic residues by means of aerobic and, secondly, anaerobic microorganisms. About 300 big and operative composting plants are present in Italy in 2014 (CIC, 2015). A particular attention is recently given to on-farm composting plants of medium and small size, and domestic size (Photo 1).

1. Photo 1. Example of domestic composting at the IC Satriano di Lucania (Basilicata Region - Italy) built according to the model reported on the right. The composer is feeded by wastes from the school canteen
2. These are object of some National and European research and transfer projects aimed at widely diffuse such on farm composting technologies in Italy (Pergola et al., 2017a; Pergola et al., 2017b) (Photo 2). Particularly, these technologies represent a strategic approach for the sustainability of some agricultural activities also solving critical issues such as the disposal of crop residues and livestock wastes. In addition, if compared to the ordinary agricultural waste disposal methods, on farm composting seems to be the most sustainable solution from both economic and environmental aspects.

3. Photo 2. Composting plant located in Eboli (Piana del Sele - Campania Region - Italy) and built within the activity of project Life+ “CarbOnFarm” - ENV/IT/000719 (Photo by AGES s.r.l.s., Academic Spin-off)
4. *Use alternative energy sources!* Although Italy has many oil and gas wells located in different regions and offshore (Sicily, Basilicata, Emilia Romagna, etc.), these satisfy only 7% of the total consumption forcing Italy to turn to the foreign market (https://www.educambiente.tv/petrolioitalia.html). Such condition combined with the strong environmental impact due to oil and gas extraction and use, and indications at worldwide level to switch to renewable energy sources, lead Italy to experience a new energy approach. Besides photovoltaic and wind energy which are significantly spreading on the Italian territory (Eurostat, 2017), promising energy sources are biogas (Photo 3) and, as its derivate, biomethane. Particularly, biogas a) comes from organic materials (organic fraction of urban

Photo 3. Biogas pilot plant located in San Michele all’Adige (Trentino Alto Adice Region – Italy) (Photo by AGES s.r.l.s., Academic Spin-off)

5. solid waste derived from separate collection, and biomasses of agricultural origin that are renewed over time) subjected to an anaerobic digestion which produces a mixture essentially of methane (CH_4), carbon dioxide (CO_2) and trace of other gases; b) it is a renewable combustible source; c) it has a neutral balance in terms of CO_2 emissions; d) it is a "green" alternative to fuels obtained from traditional fossil fuels, such as oil and coal. Biomethane can be obtained from refining biogas, achieving a combustible gas equivalent to "natural" methane - which in Italy has been commonly used for decades for heating, cooking and transport - and suitable for placing on the natural gas network and usable in the current equipments. According to the Programming Document on Biomethane Platform available on CIC website (CIC, 2016), since the end of 2015, about 1,555 operative biogas plants are present in Italy; about 77% of them are feeded by agricultural matrices. Italy is the second largest producer of European Biogas after Germany, and the fourth world producer after China, Germany and USA. Investments in the sector amounted to 3.5-4.0 billion euros and created about 12,000 new stable jobs. Seven biomethane production plants are in Italy in August 2016. The first plant is located at the Malagrotta dump in Rome and is working since the mid-1990s. Biomethane is not fed into the net and it is used as a biofuel in a series of waste collection vehicles. The others 6 are demonstrative plants made by Italian companies that intend to propose solutions for the upgrading of biogas. No one is connected to the gas network. There are 2 biomethane refueling points for natural gas powered vehicles. The opportunity to use biomethane as a substitute or additive gas in transport and distribution networks derives from the implementation of European Directives 55/2003/EC and 28/2009/EC, which give particular importance to the exploitation of gases produced from renewable energies, as the biomethane, to achieve Kyoto objectives and counteract climate change. Biomethane can play a key role in Italy's strategy against climate change, driving the Country, in this energy transition phase, towards a low-carbon economy based on a sustainable and circular resource use.

7.3 How to manage at micro level: “Man-made” solutions!

Everyone can contribute to save the Environment. Such awareness must growth in anyone - since the first years of life - and must guide us at any time of our day. It will be enough to change our daily habits and a small, but substantial, step will be done towards a sustainable use of Earth resources. This behavior can have a positive and

concrete relapse on us and our life, while guaranteeing a healthy living Environment for the future generations - our children, the children of our children, the children of our grandchildren ... infinitely! - as indicated by the universally recognized definition of Sustainability concept! Here you find the Decalogue of conscious citizen: some golden rules to contribute to the Main Objective "the Environment rescue" (adapted from www.wikihow.en).

6. turn off any power-operated instrument when you do not use it	**7.** save water (make shorter showers or fill the bathtub less; close the tap while you brush your teeth; wash the washing machine only at full load; try to water the garden the minimum you need; etc.)	**8.** eat less meat and dairy products which require high consumption of resources for their production showing a negative cost-benefit ratio
9. disconnect the electrical appliances whenever you can (they can consume "invisible" energy), use the air conditioner and the dryers moderately	**10.** recycle everything you can, avoid excessive packaging, avoid using disposable products	**11.** be a responsible and aware consumer, do not waste food, buy local food at zero miles
12. set the thermostat to 20°C during the winter (less in the night) and cover yourself more	**13.** schedule the various commissions and organize the trip accordingly	**14.** evaluate the possibility of teleworking or working from home if your job allows
15. go on foot or bike for local shifts	**16.** get public transportation, organize a car pooling service to	

	go to work or at school, get a hybrid car and have good maintenance on your car	
17. ……and so on….For further information visit the website *www.wikihow.en*		

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8 Environmental protection in Romania

8.1 Education the first

Nowadays, people use (often abusing, knowingly or not) earth's natural resources. In every corner of the land, people cut forests, extract minerals and energy resources, eroding the soil surface, polluting both water and air, creating dangerous wasting and producing a tearing of the natural areas in an unheard of rhythm in the history of life on earth. Due to the growth of the progress and overcrowding necessities, it is getting tougher and tougher for people to please their wishes and needs. And it also becomes impossible to get rid of the consequences of the serious environmental downgrading: extinction of species, expansion of the desert, pesticide contamination, growth of health problems, famine, poverty and even loss of human lives. A lot of experts are worried that if this destruction rhythm keeps on going, we will be the witnesses of gradual annihilation of the systems which supports life on earth.
Environmental education is a process who's purpose is to improve quality of life by ensuring people with necessary 'tools' to resolve and to baulk environmental issues. This kind of education can help people gain knowledge, skills, motivations, values and the engagement they need to ménage efficiently environmental resources and to assume responsibility for maintaining environmental quality.
Environmental problems are urgent and they need to be approached by the whole community, and education must be a part of the solution. Divergent views on the condition of the environment, the consequences of its degradation and the role of education are important debating and discussion subjects. Also, ecological education should not impose a certain way of thinking to the people, but help them learn how to think – including solving problems, taking decisions, weighing their options and analyzing values with personal actions.
On the other hand, environmental education increases awareness of these current issues and also the ability of understanding personal values through 'discovering' a certain attitude and consideration, helping pupils evaluate and clarify their feelings regarding the environment and how they relate to it's problems. It also helps each person understand the fact that people have different values, and that the conflicts that under come those values must be approached in such manner to avoid and finally prevent environmental issues. This education is also practical, as it teaches us things like planting a tree or reducing personal consume or how to live our lives without negatively influencing the environment at a massive scale.

8.2 Danube Delta Biosphere Reserve (DDBR), an example for environmental sustainability

At the end of a course of over 2,860 km, collecting the water from a vast hydrological basin that exceeds 8% of the area of Europe, the Danube (the second largest river of the Continent) has during the last 16,000 years built at its mouth with the Black Sea one of the most beautiful deltas in Europe, perhaps in the whole world.

The Danube Delta is famous as one of the greatest wetlands of the earth. The wonderful natural habitats formed here offer good living conditions for an impressive number of plants and animals. Among these, reeds form one of the largest single expanses in the world, amd Letea and Caraorman forests represent the northern limit for two rare species of oak thar are more frequently met in the south of the Italian and Balkan peninsulas. Together with the great number of aquaric and terrestrial plants, there are also many important colonies of pelicans and cormorans, which are characteristic of the Danube Delta, as well as a variety of other waterbirds which riside in or visit the delta for breeding or wintering. The large number of fish is also notable, with species of both high economic and ecological value.

Witthout doubt, the impressive range of habitats and species which occupy a relatively small area makes the Danube Delta a vital centre for biodiversity in Europee, and a natural genetic bank with incalculable value for global natural heritage.

Many of the plant and animal species found in the delta are also important natural resources for economic use as food, building materials and medicines, they have attracted people to the area since ancient times. The human dwellings were chiefly based on the use of these natural resources, so developing traditional economic activities and characteristic cultural and social habits. Later, there was a tendency to overexploit some of these natural resources.
This tendency, which is still seen at the present, time, put increasing pressure on the resources, especially fish and grasslands, and was compunded by the development of economic activities which were not in harmony with the environment; for example, sand mining at Caraorman upset the ecological balance, causing the loss of some areas of natural fish spawning grounds through the sedimentation and eutrophication (or nutrient enrichment) of water channels and lakes.
Because of the cumulative negative effects of human activity in the delta, together with those occurring around the delta itself, there was an increasing danger that the natural ecological balance would become irreparably harmed if appropriate measures were not taken to reduce these impacts, to restore already damaged areas, to protect the existing unaffected areas, and to harness local and regional support for these measures.

The factory briefly described above provided arguments for the designation of the Danube Delta Biosphere Reserve (DDBR) by the Romanian Government in 1990, a decision then confirmed by the Romanian Parliament through law 82 of 1993. The universal value of the reserve was recognised by the Man and Biosphere Programme of Unesco in 1990 through its inclusion in the international network of biosphere reserves. In fact, DDBR possesses all the main features of a biosphere reserve, namely:
a) it conserves examples of characteristic ecosystems of one of the world's natural areas and contains strictly protected core areas, traditional use areas, e.g. for fhising and reed harvesting, and buffer zones to reduce external impacts;
b) it is a land and coastal/marine area in which poeple are an integral component, and which is managed for objectives ranging from complete protection to intensive yet sustainable production;
c) it is a regional centre for monitoring, research, education and training on natural and managed ecosystems;
d) it is a place where government decision-makers, scientists, managers and local people cooperate in developing a model programme for managing land and water to meet human needs while conserving natural processes and biological resources;
e) it serves as a symbol of voluntary cooperation to conserve and use resources for the well-being of people everywhere.

From september 1990, the DDBR was listed as a wetland of international importance especially as waterfowl habitat under the Ramsar Convention, and is among the largest of the 600 or so wetlands so recognised. The universal natural heritage value of the reserve was recognised in December 1990 by the inclusion of the strictly protected areas in the World Heritage List under the World Heritage Convention.
The Integrated Monitoring Program of the Danube Delta Biosphere Reserve has 3 well defined purposes:
• to provide information for the scientific community, administration and politics, as a result of the research activity in physics, biology and social sciences;
• support for systematic exchanges of scientific information;
• support for the integrated monitoring of the biosphere reserves, especially concerning the global changes, biological diversity, ecosystems management, human impact and sustainable development.
From the Danube Delta Biosphere Reserve, several institutions with scientific and monitoring activities extract data and information, cooperation being necessary due to the complexity of this work.
Danube Delta Biosphere Reserve Authority beneficiates from this database and uses the information as support in the decision making process concerning the natural heritage of the area. The monitoring activity complies with the Integrated Monitoring System for the Environment in Romania and the objectives of the Management Plan for the Danube Delta Biosphere Reserve.
The monitoring system in the DDBR identifies and measures the state variables of the structure and functions of the Danube Delta ecosystems and the command factors that affect their ecological integrity, in order to prevent their effects through corresponding management measures.
The objectives of the integrated monitoring system are:
• supervision of the natural capital's evolution;
• conservation of the Danube Delta biological diversity and genetic resources;
• assisting the decisions of the socio-economical management in order to guarantee:
- prevention of the deterioration of the natural capital of the Danube Delta Biosphere Reserve;
- that the natural capital productive capacity is not exceeded;
- that the support capacity of the natural capital is not exceeded;
- the substantiation and achievement of the natural capital recovery of deteriorated components.
The conceptual model of the integrated monitoring system involves 2 main components: data obtaining system and data management system.
The selection of the domains and parameters of the integrated monitoring system is based on causal concepts, aiming the identification of impact factors that could determine the lack of balance of the Danube Delta systems.
The selection of the domains and parameters of the integrated monitoring system is based on causal concepts, aiming the identification of impact factors that could determine the lack of balance of the Danube Delta systems.
The selected domains included in the integrated monitoring system are:
1. climate and air quality;
2. hydrology;
3. hydrobiology;
4. water quality;
5. soil quality;
6. biodiversity;
7. natural resources;

8. economic activities;
9. human population.

The “physics-chemistry” domain criteria include parameters describing ecosystems structure and reflect its possible evolution. “Biology” criteria indicate the levels of environmental productivity and the “social-economic” criteria indicate the level of human pressure.

For every one of these domains, key-parameters were identified and are monitored in order to allow gathering information with maximum efficiency, using them for protecting and keeping this space as clean and as natural possible.

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