

# Informal teach-the-teacher resource manual for Environmental Education and Education for Sustainable Development



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## ACKNOWLEDGEMENTS

This teach-the-teacher manual is to a substantial degree based on different modules within the UNESCO program *Teaching and Learning for a Sustainable Future*. Efforts have been made to adjust this to what is most relevant in a Vietnamese context. Special thanks should also be directed towards Pat Kirby and the *Mekong Climate Action Group*. The sections on Climate Change and green living have more or less been borrowed from their manual on the same topic. It is our hope that this teach-the-teacher manual can support teachers in An Giang and elsewhere to make Environmental Education an indispensable part of a long-term change towards sustainability.

## Introduction

Our common natural environment is sometimes called Mother Earth. Although it sometimes seems to be forgotten, human beings are part of the nature. In comparison with other species we have however also the ability to transform nature in accordance with our preferences and plans.

This has also been done during thousands of years at least since the first human settlements. But the relation between human society and nature came to change more drastically with the beginning of the industrial revolution. Since then we have witnessed an increased exploitation of natural resources and ever higher levels of waste and pollution disposed into the global environment. This burden is becoming so significant that nature is today finding itself under great stress. Thus a wide range of environmental problems is now facing us.

This has been expressed by the Secretary-General of the United States, Ban Ki-Moon, when he stated that

Rapid environmental change is all around us. The most obvious example is climate change (...). But that is not the only threat. Many other clouds are on the horizon, including water shortages, degraded land and the loss of biodiversity. This assault on the global environment risks undermining the many advances human society has made in recent decades. It is undercutting our fight against poverty. It could even come to jeopardize international peace and security.

The UN mandated *World Commission on Environment and Development* stated in its well-known report from 1986 that although significant positive achievements have been obtained around the world, “the same processes that have produced these gains have given rise to trends that the planet and its people cannot long bear”. The solution was to be found in a development path that was truly sustainable in meeting the needs of the present without compromising the ability of future generation to meet their own needs.

Education on sustainable development (ESD) has come as a response to the need of finding alternatives paths of development and raising awareness for different environmental concerns. Although some of the most pressing environmental challenges are global, there are local variations and expressions. Change must in any case stem from every individual or community taking actions.

Teachers and schools have a crucial role to play in increasing critical awareness and in fostering a sense of shared responsibility. The youth of today can become the ambassadors of the future. Education on sustainable development thus constitutes an essential part of a long term transformation of our way of living together in which the natural relation with Mother Earth hopefully is reconciled and fully appreciated.

### **Environment is not just about the environment**

The nature consists of a variety of ecological systems in different spheres on earth, such as the geo, bio or atmo-spheres. They react to each other in a complex and interdependent way. In a similar way do the ecological systems respond to human involvement. This happens when we use resources that originate from the nature or natural processes, cause pollution or dispose waste from production and consumption.

Environment is thus not a specific subject that can be separated from other issues. Environmental degradation can be both a cause and effect of poverty and vice versa. Overfishing in the Mekong River can stand as an example. Poor people depend on catching fish for subsistence or income. A reduced quantity of fish in the river can make these people more eager to catch the fish that do remain. This might at some point lead to complete depletion. The result is thus not only environmental degradation but also increased poverty.

There is thus not only a relation between environmental degradation and poverty, but also with economic development. If a country pursues a strategy for economic growth and industrial modernization that is built on overuse of resources and causes substantial pollution, this will undermine the resource base on which an economy it built, leading to environmental problems and increased poverty.

Mutual relationships have to be clarified. It is in this way that sustainability needs to be understood, not as a single subject but as a dimension. This dimension ought to be integrated in different academic fields and study areas because everything which is not sustainable will cause problems sooner or later. Thus it is better to get things right from the start.

### **A holistic understanding of sustainability**

It is sometimes argued that sustainability needs to be understood in a holistic way. This means taking a comprehensive look in trying to appreciate all different subjects and elements of a system and valuing their relationships. Hence sustainable development is often described as three supportive pillars – ecological, social and economic – that are mutually important and ought to reinforce each other.

According to a *Parliamentary Commissioner for the Environment* in New Zealand, sustainability “is the goal of sustainable development – an unending quest to improve the quality of peoples’ lives and surroundings, and to prosper without destroying the life-supporting systems on which current and future generations of humans depend. Like other important concepts, such as equity and justice, sustainability can be thought of as both a destination and a journey”.

### **Environmental problems can travel from one country to another**

In the same way that environmental issues do not concern only one aspect of society, nor does it limit itself in a geographical sense. Most environmental problems are in fact global and pollution can easily travel from one country to another. If the nuclear plant in Fukushima would have had a complete meltdown this would have severe negative affects affecting many more countries than Japan.

Sustainability does not only ask for inter-generational solidarity, but also transnational; i.e. over the borders. If we ask others to clean up their garden, we must have done the same in ours already. If others refuse to do this it is not an excuse for us to do nothing. In a global world with many pressing environmental problems the responsibility need to be shared but differentiated. This means that all nations and peoples of the world have a collective responsibility for the global environment, although in possibly different ways.

The today wealthy countries of the world carry a historic responsibility for most of the greenhouse gases that have been accumulated in the atmosphere. In the same way have they overused more resources of a limited global stock and exported pollution to other parts of the world. These countries have an ecological debt to repay to the rest of the world and the planet.

This was expressed clearly in chapter four in *Agenda 21*, the global action plan for sustainable development, when stating that “the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries, which is a matter of grave concern, aggravating poverty and imbalances”.

### **The ecological footprints**

This situation becomes tragically clear when using the ecological footprints as a point of departure. This concept tries to measure the use of resources that is necessary as to sustain different consumption levels as well pollution/waste generated from production in different parts of the world. According to the *Living Planet Report 2012* by WWF;

Demand on natural resources has doubled since 1966 and we are currently using the equivalent of 1.5 planets to support our activities. High-income countries have a footprint five times greater than that of low-income countries. “Business as usual” projections estimate that we will need the equivalent of two planets by 2030 to meet our demands.

The problem is however that we have only one planet and the ecological systems here already find themselves under great stress. The consumption levels of the rich countries need to be reduced and their economies fundamentally transformed. Countries that today are poor but aspire to become wealthier in the future however also carry a responsibility to choose a development path where sustainability is ensured and that the global burden on the environment is not further increased.

The ecological footprints are a reminder of the fact that environmental issues do not only deal with the nature, but is also a question about global solidarity and social justice. A fairer redistribution of wealth and enhanced equality can facilitate the profound changes in the current production and consumption model which are necessary as to approach sustainability.

#### *Brief summary of the most important points:*

- Environment is not a separate subject but needs to be understood in relation to other aspects in the society. There is for example a relation between environmental degradation and poverty.
- Sustainability is a dimension that can be integrated in different issues and concerns. It needs to be expressed in a holistic way and positive changes are to be found using an interdisciplinary approach.
- Many environmental problems are global and solutions need to be found internationally. To inspire others to change a lot can be done on the local level.

- More affluent nations have a historic responsibility for many environmental concerns, and they must take a lead for change. This does however not excuse inaction or bad decisions among poorer nations.

## **Education for Sustainable Development**

Paragraph 36 in Agenda 21 states that “Education is critical for achieving environmental and ethical awareness, values, and attitudes, skills and behavior consistent with sustainable development and for public participation”. Within the frame of the United Nations, UNESCO, has been appointed as the task manager for accelerating educational change.

One of the conclusions that has been drawn so far is that “there is a need to refocus many existing education policies”. At the UNESCO World Conference on Education for Sustainable Development in Germany in the beginning of 2009, it was more specifically expressed that continued work ought to focus on;

Support the incorporation of sustainable development issues using an integrated and systemic approach in formal education as well as in non-formal and informal education at all levels, in particular through the development of effective pedagogical approaches, teacher education, teacher practice, curricula learning material, and education leadership development. (...) Sustainable development is a cross-cutting theme with relevance to all disciplines and sectors.

### **The situation in Vietnam**

The government of Vietnam and the civil society here is committed to Education for Sustainable Development (ESD). In the national Agenda 21 strategy improvement of education quality and public awareness are identified as priority areas. In the *National Action Plan on Education for Sustainable Development in Vietnam 2010-2014* the objectives were set to continue raise awareness, develop capacity and to integrate consciousness into practical actions through changes in educational strategies, policies and programs. Education is thus to be found at the heart of a path towards sustainability and teachers have an essential role to play for lasting change.

ESD does however not start and does not end in the classrooms. It is directly related to what is happening around us, either locally or globally. It can potentially constitute a bridge between individual concern and worry towards critical awareness and focused community action.

The role of the teacher is not to teach all possible implications from for example Climate Change, but to inspire and facilitate for students to investigate themselves. Students should be stimulated to come up with solutions to local concerns. This has not only the potential of increasing knowledge and awareness, but can also encourage changing individual and/or collective values, attitudes and behaviors. While teaching/learning in the classroom can be a link between individual worry and positive change, so can students themselves come to constitute a lever to change in their families or their local communities.

### **Valuable skills**

Some of the valuable skills that can be fostered while teaching ESD are researching, critical thinking, creative problem solving, cooperative capacity, presentation and communicational skills. Since there is also a scope for community outreach and local change, engagement with the society and commitment to sustainable ideals and principles is likely to be encouraged. It does create an approach among people that is beneficial for lifelong learning and can lead to involved citizenry and enhanced ethical responsibility.

The important role that can be played by universities and higher education institutions should not be neglected. To develop this work further some institutional and practical limitations might need to be overcome.

One challenge is to move away from is the tendency to compartmentalize knowledge and treat environmental education as yet another limited field of competency. If sustainability is to be understood in a holistic way, than a more interdisciplinary way of working needs to be encouraged. People from different faculties and departments ought to work together on specific issues, say for example Climate Change. Such a co-operation is likely to nurture new fruitful interactions and would stimulate creativity in finding solutions to intricate but interconnected challenges.

### **How to measure development?**

A related issue of fundamental importance is the question of how to measure development. This is not at least relevant for a country like Vietnam that is changing rapidly and aspires to become an industrialized nation in 2020. Many observers claim that the traditional way of using GDP (Gross Domestic Product) growth as an indicator for development is inadequate, since it is only focusing on quantity, and not the quality of economic activities in a specific country.

This led the United Nations to construct the **Human Development Index**. This index not only measures real GDP per capita but also tries to assess average achievement on longevity, knowledge and a decent standard of living. There is thus a broadening of scope from only focusing on GDP growth. There is also a range of other alternative ways of measuring development. **The Happy Planet Index** ([www.happyplanetindex.org](http://www.happyplanetindex.org)) is for example using data global data on life expectancy, experienced well-being and ecological footprints to measure to which extent countries deliver long, happy, sustainable lives for the people that live in them.

### **Principles for environmental protection**

Close to this discussion are important principles that are to be found at the heart of environmental protection work. One is the **precautionary principle**. It states that in cases where scientific evidence is uncertain or where preliminary evaluation indicates that there is ground for negative effects on the environment or human health, it is better to be precautionous and not pursue a specific action.

Another principle is embedded in the old idiom that **prevention is better than cure**, i.e. it is better that choices are made today that will prevent future harm than making decisions that might lead to negative consequences at some point. A third principle is the **polluters' pays** principle which means that the company or person who pollutes the environment should be financially responsible for harm caused. If a company for example releases chemical toxics into a river, they should be responsible for cleaning up the river and providing financial compensation to people affected by this situation.

These principles are important when discussing sustainable development or how to measure progress. They ought to be integrated into teaching. In the real world there can at times be a trade-off between economic growth and environmental protection. Education for a sustainable future can guide people and decision-makers to reach positive decisions that ensure the well-being of the environment while also supporting human blossoming.



*Brief summary of the most important points::*

- Education for sustainable development is globally led by UNESCO, which has stated that education needs to be refocused and foster values, attitudes and actions that support sustainability.
- The government of Vietnam is committed to the cause for sustainable development and education has been highlighted as a priority area for raising awareness and changing behavior patterns.
- ESD can advance important skills, such as creativity, creative problem solving and cooperation, while stimulating active citizenship and lifelong learning approaches.
- Challenges to ESD need to be overcome. The tradition of compartmentalization of knowledge and the lack of cooperating in an interdisciplinary way need to be addressed.

### **Where and how to start**

The task to teach about environment or discuss critical issues related to a sustainable development can seem daunting. There are so many issues to discuss, so many problems to solve! The combination of different dimensions, geographical spheres and a general complexity can make it difficult to know in which end to start.

### **Start digging right here!**

One point of departure is to **dig where you stand**, i.e. start the educational work in your local community. There are many advantages with such an approach. It is likely to be a more meaningful work for students to learn about issues that concern their own families and the broader community. If the teacher is unaware of which threats pose the greatest challenges to sustainable development in the own region or city, the students can be encouraged to distribute surveys among the local people, conduct internet research, interview governmental representatives or NGO people as to find out more.

It can also be worthwhile to organise **field trips** to gather information or interview people directly affected. One example would be Climate Change, where Vietnam in general but the Mekong Delta in particular is exposed. A transformative education can support communities becoming more resilient.

Another current challenge in Vietnam is the constantly growing amount of waste that all too often results in negative environmental pollution or cause public health concerns. Students could dig into the problem by investigating waste patterns in their own families or local communities; how much and which kind of waste is generated? From this information ideas can be developed on how to strengthen waste separation or how recycled material can be reused or converted into new objects. Interest can also be stimulated by arranging competition where students are asked to develop new objects from recycled material.

### **Go into the dark**

From the first principle of digging where you are, one can proceed by going **from the known into the unknown**. Starting in the local area with concerns that are fairly familiar is an excellent point of departure. As stated previously, environmental problems are however normally transnational and related to other aspects of society. From the knowledge and insights that have been obtained by the students so far, a continued investigative work can explore the unknown by putting the dots together as to discover the uneven patterns that are likely to emerge on the global level, which in the final end also will affect what happens locally.

When speaking about waste, it is clear that although positive changes can be obtained locally by waste reduction or increased recycling, total waste levels will continue to increase in the country if no other changes are made nationally. The general situation for waste generation and factors affecting this in Vietnam need to be investigated. It could thus be necessary to clarify governmental positions, NGO initiatives and national measures as to reduce waste in Vietnam.

A slogan that normally has been associated with the work pursued within Agenda 21 is to think globally and act locally. This slogan comprises the idea the environmental problems and their solutions are to be found on the global level, but that actions for change can be initiated locally. It is

thus a slogan that corresponds well with the objective with education for a sustainable future. Considering however that most issues are interconnected and the need for mutual inspiration, a somewhat updated slogan these days could be to **think globally, act locally (and globally!)**.

Education for sustainable development strives to make students active subjects for positive change. By raising awareness and providing educational tools for complex issues, students are empowered and might help transform values, attitudes and behavior patterns in their families and local communities. By acting locally, they are also reaching out to people around the world involved with their local communities building a more just and sustainable world. This could result in inspiration, contacts and insights that might last a lifetime.

## Teaching activities

There are a number of different teaching activities that can be integrated into lessons to enhance learning about environmental issues and sustainable development. Teachers naturally have the responsibility of framing the lessons in providing a general background and overview to the specific topic which will be highlighted. It is however up to the whole class to collectively expand the base of knowledge and in gaining valuable skills. Also the teachers can thus gather a lot of useful information from the individual work conducted by the students.

### Strategic questioning for stimulating interest

Teachers can use *strategic questioning* as a technique for raising awareness and stimulate interest. When preparing the lesson the teacher thus has to consider specific questions that are relevant for the purpose of the class that will help focus the attention of students. These questions can also work as a driver for change and will support efforts to find solutions to local concerns. Asking the right questions can thus make a real difference. It aims to bring forth new knowledge and insights, for the students but also for the teacher.

Different people would frame the process of strategic questioning in different ways. But the first set of questions would try to describe the issue or concern at stake. Questions that are relevant here are focus questions, observation questions, analysis questions and feeling questions. If for example one lesson would discuss the case that some Vietnamese people dispose plastics (like bags and bottles) rather carelessly into the nature without much consideration, some initial strategic questions could be formulated like the following ones:

- *Focus questions*; what do you do with a plastic bag or bottle after you have used it? Was there more or less plastic in the nature when you were younger? How has it changed over time? Which values do you think children will learn from seeing all this plastic in the nature?
- *Observation questions*; what do most people do with plastic after they have used it? What does your family or local community do? Where can you observe plastic in the nature, and have you seen plastic in places you least expected it? Is there any recycling or reuse of plastic in your family? How much plastic do you think is thrown into the nature in Vietnam every year?
- *Analysis questions*; what happens with the environment when plastic waste ends up there? Which substances do plastics contain that might be dangerous? If nothing changes, how do you think the nature will look in 20 years?
- *Feeling questions*; How does it affect the environment, the animals or public health? How do you feel when you see plastic waste in the nature? How do you think foreign visitors or tourists will feel? Have you ever visited other countries, and if so, noticed the amount of plastic in the nature there?

The next set of questions moves on by digging deeper. Questions that can be relevant here encompass change questions, consider the alternatives questions, considering the obstacles questions and personal action questions. These questions are thus likely to stimulate creativity and foster an innovative approach in finding solutions in moving from what is known now to what could be.

- *Change Questions*; what should people do instead of throwing plastic into the nature? It is possible to convert plastics into something new that might be useful for your family or local community? What do you like to do that might be useful in bringing about these changes?
- *Consider the alternatives questions*; how can these changes become possible? How can the behavior of your family or other people change? Which support is needed from the local community, government or your school? What can you change in your daily life? Which are the likely consequences if you would initiate change?
- *Consider the obstacles questions*; which obstacles to you identify that hinders the changes you want to see? How can these obstacles be overcome? Which information or support do you need to facilitate change?
- Personal action questions*; can you influence others by changing something in your own life? What can you change in your daily life? Can you work with others as to overcome the obstacles identified and come close to the ideal situation you want to make possible?

Strategic questioning can thus be used as a technique for identifying a local concern, relating to a personal commitment and potentially leading to an action plan for change. The process as such is dynamic, reflective and empowering as it supports people to find solutions to their own problems. It has for example been used as a technique by local people in India to improve the water quality in the Ganges River in cooperation with the government.

### **Community survey for investigating the local community**

One way to investigate the local community and the most critical concerns there is to conduct a community survey. The point of departure would be to find out how the community is like? It is located in the city or the countryside? What is the state of the local environment? Are there sufficient recreational areas, parks or public transport facilities? Are people happy with their community or which aspects cause concern?

This survey would thus be a way to monitor how sustainable your community is. Future progress would also be based on this assessment. The **One Planet framework** ([www.oneplanetliving.org](http://www.oneplanetliving.org)) has been developed to support local communities towards more sustainable practices. It strives to keep down the ecological footprints and for the global society to live within the carrying capacity of earth.

Much inspiration can be found here as to make the city greener or the community more sustainable. The framework consists of 10 principles. Among these one can find zero carbon, zero waste, sustainable transport, use of local material, sustainable water use and fair trade.

### **Enquiry learning for finding out more**

Another pedagogical method which can be used is *enquiry learning*. This learning process originates in a challenge and involves active investigation. There are seven stages in this model; tuning in, deciding directions, preparing to find out, finding out, sorting out, drawing conclusions and finally considering social action.

The objective of tuning in is to identify and define the issue. From this follows deciding directions and formulation of hypothesis, choosing a focus and defining the scope. The next step concerns how to design the enquiry and how to implement it. In the finding out stage the paths towards obtaining the

relevant information or who to contact are explored. From collection of data is important to sorting out, thus how to categorise, organise and present the results obtained. When this has been done is it important to interpret the data and draw conclusions, which new knowledge or understanding has been generated. The final step requires the students to translate their finding and conclusions to specific social actions or recommendation that could be presented to local policy makers or the broader community.

### **Back from the future**

Another method for enhanced learning is the strategy of **Future Problem Solving**. This strategy starts in the future in finding solutions to a current problem. The strategy starts with having the teacher clearly stating an environmental problem with significant negative consequences occurring in the future, for example rising of the global sea levels. This problem can be introduced using current newspaper, video or role play that open up for future projections. Following this the students will pursue a six step process for solving a problem from a future's perspective.

Identifying possible causes and effects

Identifying the underlying problem

Brainstorming potential solutions to the underlying problem

Developing criteria to evaluate solutions

Evaluating all solutions to determine the best one

Developing an action plan for the best solution

### **Solving community problems**

To further foster engagement with the local community, a strategy of **Community Problem Solving** can be used. This is a practical application of the ideas for active citizenship and community outreach. Students are thus encouraged to actively address local community concerns and coming up with sustainable solutions.

There are eight main steps in this strategy; taking action, selecting problems, investigating, planning actions, exploring community concerns, assessing students skills, developing visions of a sustainable future as well as evaluating actions and changes. The steps can be adapted to local circumstances and it is important to maintain flexibility. As to support the students to focus the teacher needs to select issue/s that are practicable and relevant for students to investigate, which possibly could be done in consultation with local policy makers.

### **Working in the field**

Another practical approach is to conduct *field teaching/researching*. If the issue for example is Climate Change, then a field trip can be organised to a local area which is exposed to negative impact, for example small-scale farmers suffering from flooding or soil erosion. Student would thus not able to investigate a real case situation but also get involved with people in the local communities on how to enhance resilience.

When organising a field trip it is important with preparation. The objective of the study need to be defined and the place which is to be visited needed to be checked in advance, so that people living

there are informed and willing to participate. It is also important to make sure that the location is easily accessible and that is safe working environment.

During the field visit it can be useful to distribute some specific information or organise activities that can guide the students. This can be done through for example interviews with local people or visit to a concerned area. After the conclusion of the visits it can be important with a follow-up activity in the class room where students share experiences and draw joint conclusions. These could be communicated to the local community or the local policy makers.

### Teaching resources on the internet

A lot of valuable resources for both teaching activities and different topics can be obtained from the internet. Inspiration can be drawn from work that is pursued around the world. Teachers from different countries can support each others in global educational efforts towards sustainability. Below is a non-exclusive collection of home pages that can be useful for lesson planning and for the work to come.

The Flemish Association for Development Cooperation and Technical Assistance (VVOB) has prepared a teacher training manual for an Environmental basic course in Vietnamese, particularly in lower secondary education.

<http://www.vvob.be/vietnam/?q=resources/environmental-education-basic-course>

UNESCO has prepared 27 modules teaching and learning for a sustainable future. It provides professional development for student teachers, teachers, curriculum developers, education policy makers, and authors of educational materials.

<http://www.unesco.org/education/tlsf/>

Centre for Environment Education was established in 1984 in India and is committed to ensuring that due recognition is given to the role of Education in the promotion of sustainable development.

<http://www.ceeindia.org/cee/index.html>

Oxfam Education offers a huge range of ideas, resources and support for developing the global dimension in the classroom and the whole school. All of the resources here support Education for Global Citizenship – education that helps pupils understand their world and make a positive difference in it.

<http://www.oxfam.org.uk/education/>

The Education for Sustainable Development Toolkit will help schools and communities develop a process for creating locally relevant and culturally appropriate education. This Toolkit is based on the idea that communities and educational systems need to dovetail their sustainability efforts.

<http://www.esdtoolkit.org/discussion/default.htm>

The European Support Centre and the Austrian Chapter of the Club of Rome developed the *European Environmental Education* project as a new area of activity. The goal of the project is to raise environmental awareness on a lasting basis.

<http://www.eeepjcts.net/index.php?modus=1>

The Australian Sustainable Schools Initiative is a partnership of the Australian Government and the territories that seek to support schools and their communities to become sustainable.

<http://www.environment.gov.au/education/aussi/index.html>

The Foundation for Environmental Education (FEE) is a non-governmental and non-profit organization aiming to promote sustainable development through environmental education.

<http://www.eco-schools.org/>



The Association of University Leaders for a Sustainable Future supports sustainability as a critical focus of teaching, research, operations and outreach in higher education through publications, research, and assessment.

<http://www.ulsf.org/resources.html>

The Division for Sustainable Development (DSD) provides leadership and is an authoritative source of expertise within the United Nations system on sustainable development.

<http://www.un.org/esa/dsd/>

The International Institute for Sustainable Development champions sustainable development around the world through innovation, partnerships, research and communications.

<http://www.iisd.org/>

ENDA - Environment and Development Action in the Third World essential aim is the fight against poverty and for sustainable development. Emphasis is also on the methods and means of action that are best suited for bringing these aims together

<http://www.csr360gpn.org/partners/profile/enda/>

The Stockholm Environment Institute (SEI) is an independent international research institute that have been engaged in environment and development issues at local, national, regional and global policy levels for more than 20 years.

<http://www.sei-international.org/>

Global Environmental Outreach Centre (GEOC) focuses on providing information to the major groups identified in Agenda 21.

<http://geic.hq.unu.edu/index.cfm>

Vietnam News has a section on environment where they publish articles specifically relevant for the situation in Vietnam.

<http://vietnamnews.vnagency.com.vn/environment>

This homepage offers a lot of different lesson plans and teaching activities related to environmental issues and concerns.

<http://www.eslflow.com/environmentlessonplans.html>

## **Climate Change and global weather storms**

Climate change is a change in the average pattern of weather over a long period of time. The Earth's climate is extremely important as it provides the conditions for life to exist on Earth. Climate has changed dramatically in the Earth's 4.5 billion year history and studies of past climates has shown us that climates can shift abruptly, causing mass extinctions.

### **What is the Greenhouse Effect?**

Earth's climate is currently becoming warmer as a result of the enhanced Greenhouse Effect. Greenhouse gases in the atmosphere trap heat from the sun and warm up the Earth's atmosphere. This Greenhouse Effect is extremely important, without it the Earth's surface would be -15°C. However, if we increase the amount of greenhouse gases in the atmosphere (as we are doing at the moment), we will trap more heat in the atmosphere, causing global warming. The most important greenhouse gas is carbon dioxide (CO<sub>2</sub>), however methane (CH<sub>4</sub>) and nitrous oxide (NO<sub>2</sub>) are also very important.

### **What is causing current Climate Change?**

Unlike changes that occurred in the Earth's climate millions of year ago, there is nothing natural about current Climate Change. Since the Industrial Revolution in the late 18th Century, humans have been burning massive amounts of fossil fuels (oil, coal and gas), which along with industrial processes such as cement production, has released huge amounts of CO<sub>2</sub> into the atmosphere - such that the CO<sub>2</sub> level in the atmosphere is currently the highest it has been in the past 800,000 years.

Intensive agricultural practices are the main source of the two other most important greenhouse gases – methane and nitrous oxide. Widespread intensive cattle grazing and rice paddy production has not only released massive amounts of methane and nitrous oxide, but it has resulted in intense deforestation. Forests are crucial in helping to slow down global warming by storing and sequestering carbon. Rainforests once cover 14% of earth's land surface – now they cover a mere 6%.

Although practices such as the burning of fossil fuels and deforestation have been occurring for a long time, the scale of these practices has increased dramatically since the Industrial Revolution, and particularly in the last 40 years, and this has been accompanied by rapid population growth (currently 7 billion, and expected to be 9 billion by 2050).

### **Impacts of Climate Change**

We have already begun to see the catastrophic effects of our greenhouse pollution. Average temperatures have been increasing globally over the past century, and particularly in the last few decades. The last decade has been the warmest since records began. This has caused widespread melting of glaciers and ice caps, causing sea level rise, and decreasing the amount of water available for downstream communities.

Not only is the atmosphere becoming hotter and more humid but there has been an increased frequency and severity of extreme weather events such as cyclones, typhoons, floods, droughts and heat waves. Rainfall patterns are changing and monsoon seasons are becoming more intense and more variable.

Rising ocean temperatures are causing the bleaching and destruction of the oceans most important ecosystem – coral reefs. Uptake of CO<sub>2</sub> by the oceans is also causing the oceans to become more acidic, which will drastically impact on marine species and cause mass marine extinctions.

Water-borne and mosquito-borne diseases such as malaria, dengue fever, cholera, dysentery, typhoid and anthrax are increasing.

### **Climate Change and Vietnam**

A report made public by the United Nations Development Program concluded that Vietnam “is graded fifth under vulnerability under the impacts of CC”. Considering the importance of agriculture production for many people in the country negative effects are already evident. This has also been confirmed by members of the Vietnamese government who recalled that a broad majority of the population, especially the poor, are suffering from environmental degradation and negative outcomes due to Climate Change.

Higher average temperatures, changed rain patterns and an increased sea level will directly threaten the livelihood and production of people on the Vietnamese country side. There are also more than 18 million Vietnamese people living on the coastal districts of the country, and their continued existence is directly related to fishing and aquaculture activities. This number of people amount to almost a quarter of the total population.

The main crop being produced in the Mekong Delta is rice, which (together with corn) is the main staple food in Vietnam, feeding most parts of the population on a daily basis. It has been argued that the Mekong river delta is one of the areas “most vulnerable to the impact of global warming in Vietnam due to rising sea levels.” A study by the World Bank stated that about “20–30 percent of the Mekong River Delta will be affected by 2100, and some areas will be salinated”.

Due to the increased sea levels as well as higher frequency of flooding which will lead to intrusion of salt on fertile land, the available absolute area for production is likely to be diminishing. If productivity is not enhanced, total production of rice and other staple foods might be threatened. This is not only problematic due to loss of employment, livelihood and national income, but also considering the fact that the population of Vietnam is still growing extensively.

### **More teaching resources on Climate Change**

<http://www.climatechoices.org.uk/pages/activities0.htm>

<http://serc.carleton.edu/NAGTWorkshops/climatechange/index.html>

<http://www.climatechangeeducation.org/>

<http://www.pbs.org/now/classroom/globalwarming.html>

<http://www.fraserinstitute.org/publicationdisplay.aspx?id=13555>

<http://www.teachingenglish.org.uk/lesson-plans/climate-change>

[http://www.foe.co.uk/learning/educators/resource\\_index.html](http://www.foe.co.uk/learning/educators/resource_index.html)

[http://www.ema.gov.au/www/ema/schools.nsf/Page/TeachLesson\\_PlansClimate\\_change](http://www.ema.gov.au/www/ema/schools.nsf/Page/TeachLesson_PlansClimate_change)

<http://www.teachclimatechange.org/>

### **Biological diversity loss is loss of life**

Biological diversity is an expression of the variety of different life forms in nature. This can relate to species, plants or even genes and microorganisms. The scope can be either a local forest close to your home or globally. It is also a measurement of the health of a specific ecological system. The more diverse nature in general is the healthier are the ecological systems and the specific life forms that depend on those. The biosphere is the place where the magnitude of life forms meets the non-living components of the planet in an interdependent and ever-changing web.

Biodiversity supports earth with what is commonly called ecosystem services. These are services that make life possible on earth, although we are not always able to visually perceive them. This encompasses regulation of the climate, purification of water, pollination and prevention of soil erosion. Nature is also providing resources that are necessary as inputs to the economy. The most familiar would encompass oil, fiber, timber and food.

### **Human impact on biological diversity**

The emergence of human civilizations during the last few thousand years has however had a negative impact on biological diversity. We are now living in what has been called the Holocene mass extinction period. Plants and species are disappearing from nature faster than any previous time in human history. This is occurring more than 100 times faster than would have been reckoned as a normal rate. Some calculations claim that with the current rate of extinction most species on earth will be eliminated within less than 100 years.

The current mass extinction is primarily caused by human activities. The main reason is habitat destruction. This means destroying or undermining the physical environment in nature where different species or plants are living and/or reproduce. This is happening when rain forests are chopped down on Borneo to open up land for oil palm plantations or when land is cleared for mining and industrial processes. Other common reasons for loss of biological diversity are overkill, introduced species, pollution, poaching and human over-population.

Biological diversity is not equally spread over the globe. Normally the closer one comes to the equator, the more variety nature offers, at least when compared with the South Pole. Tropical rain forests are usually called biodiversity hotspots since they are regions with a high level of widespread and different life forms. From a global perspective, Southeast Asia constitutes a biodiversity hotspot.

### **Biological diversity in Vietnam**

One of the countries in this region that historically has had a rich biological diversity with many plants and species is Vietnam. This is thanks to the country's diversity of climate, landscapes and terrains as well the extended coast line. The significant population increase and the last decade of economic growth have however created severe threats to the country's biological diversity. Given that Vietnam is also highly vulnerable to Climate Change, this stress is likely to become even worse in the future.

A conservation group recently ranked Vietnam the worst country for wildlife crime. This ranking is based on a comparison on how well 23 Asian and African countries protect rhinos, tigers and elephants. The country is a major import destination for illegal wildlife products. Domestically habitat

destruction and poaching also cause considerable concern. The amount of wild elephants has for example fallen from around 2000 in 1990 to less than 100 animals remaining today, making it extremely endangered. The total number of endangered wildlife species has according to the Vietnam Red Book 2007 been estimated to 882; including 418 animal species and 464 plant species.

As to prevent further biodiversity degradation, the government has taken different policy initiatives and promulgated corresponding laws. The long-term objective that was formulated in the *National Action Plan on Biodiversity* in Vietnam signed in 2007 is to protect to protect the rich and unique biodiversity resources within the sustainable development framework of Vietnam. Some more specific goals that were set are to effectively protect precious, rare and endangered animals and plants as well as conduct propaganda and education to raise public awareness about natural conservation and the importance of biodiversity.

**More teaching resources on biological diversity:**

<http://www.cbd.int/ibd/2008/resources/teaching/>

<http://www.environment.nsw.gov.au/resources/education/BiodiversityTeachersGuide.pdf>

<http://www.biodiversity911.org/EducationalResources/EducationalResources.html>

[http://www.durhambiodiversity.org.uk/pdfs/Biodiversity\\_Guide\\_for\\_Teachers.pdf](http://www.durhambiodiversity.org.uk/pdfs/Biodiversity_Guide_for_Teachers.pdf)

<http://www.decadeonbiodiversity.net/education>

<http://eelink.net/pages/EE+Activities+-+Biodiversity>

## **Ways to a greener life and future**

There are a number of different ways that individuals and local communities can act as to carry out more sustainable practices in their everyday life. One person can inspire other to change. Many people changing together can inspire the whole world. Students can receive support and advices from their teachers on how the live in a more environmentally-friendly way. Specific teaching activities can be designed or lessons plans formulated encouraging students to commence the journey towards a greener and more sustainable future already today.

### **Save Energy and Reduce Emissions**

- Walk, cycle or take public transport
- If driving, use a fuel-efficient vehicle
- Use less water and minimise use of hot water
- Switch off appliances e.g. TV, computer, printers (rather than leaving on standby)
- Switch off lights and fan every time you leave an empty room. Minimise use of A/C
- Shift to energy efficient light bulbs
- Fly less

### **Shop Green**

- Only buy what you need – live simply
- Cut down on packaging and waste – don't buy bottled water or plastic packaging
- Bring and reuse your own cloth bags, bottles and cups
- Refuse plastic bags and unnecessary packaging
- Choose environmentally friendly materials
- Buy locally-made products
- Avoid buying nasty chemicals

### **Save the forest**

- Plant trees -> this will capture carbon dioxide and add oxygen to the atmosphere!
- Use recycled paper and minimise paper use

### **Recycle**

- Separate glass, metals, aluminum cans, PET, batteries, E-waste and paper
- Compost your food waste
- Use your creativity for finding innovative ways of reusing objects

### **Eat green**

- Grow your own food (use your own compost)!
- Buy local and organic
- Eat less meat or even better become vegetarian/vegan
- Cook using organic waste (e.g. coconut husks) and/or animal dung

### **Improve your Eco-Handprint**

- Promote a green lifestyle – lead by example, your actions will inspire others!
- Help to raise awareness about climate change and other environmental issues
- Volunteer for an environmental organisation

- Say “YES” to renewable energy, find sources for renewable energy sources in your own community

### **Green Consumerism**

Green consumerism is the ‘practice of purchasing products and services that actively seek to minimise social and/or environmental damage, and the avoidance of products deemed to have a negative impact on society or the environment’ - put our planet and people first!

### **How to be a Green Consumer**

- 1) Only buy what you need: Reduce, Reuse, Recycle, Refuse, Refill, Repair, Rethink, Revalue
- 2) Positive Purchasing - favoring ethical products, e.g. energy saving light bulbs
- 3) Negative Purchasing - avoiding unethical products, e.g. battery-farmed eggs or gas-guzzling vehicles
- 4) Company-based Purchasing - targeting a business as a whole, and avoiding all the products made by one company (‘boycott’). Boycott companies that directly damage the environment or support activities that destroy habitat. Only deal with ethical companies.

### **Tips for being a Green Consumer**

1. Buy less – repair, reuse, borrow and share with friends and family instead
- 2) Buy organic – a vote for environmental sustainability!
- 3) Buy local – support local business and reduce food miles
- 4) Avoid non-biodegradable and/or toxic chemicals – choose eco-friendly, natural, non-toxic chemicals instead
- 5) Avoid products with extensive packaging – avoid buying products with lots of plastic packaging
- 6) Choose recycled paper (chlorine-free) – this reduces the amount of trees that need to be cut down, and avoids the use of toxic chemicals in bleaching paper
- 7) Avoid products that test toxic chemicals on animals
- 8) Avoid food that has harmful additives – e.g. preservatives, flavor enhancers
- 9) Choose eco-friendly alternative materials - e.g. bamboo, hemp, coconut
- 10) Being a Green Consumer is not only about what goods you choose to buy, but what services you use, e.g. investments, banking, recreation, leisure etc.

### **Let your voice be heard!**

Speak out against environment abuse and unethical practices. As well as boycotting unethical products it is important to email or write to companies and tell them why you are boycotting their product. This will convince the company to change their practices to avoid going out of business. You can also raise awareness of the issue by talking to your friends, family and community. You can also contact and pressure local or national policy makers to act for greener solutions to the problems facing our society today.

More advises and personal tips on how to live more sustainable can be found on;

<http://postgrowth.org/act/personal-steps/>

<http://www.ethical.org.au/>