

# SEEEP book



Produced by: Centre for Rural Technology, Nepal

Towards Action for Development.... Since 1989

## SEEP Project investing in our future...



Climate change, environment and energy have become burning topics in today's world especially because of the strong interrelationship between them. Climate change has started to impart adverse effects on livelihoods of people, particularly in developing countries where communities are more vulnerable and are barely prepared to face the consequences of climate change. Although efforts are being made from around the globe to combat climate change and to reduce the global emission of climate forcers, it is important that awareness be raised at grass-root level so that changes could be brought in day-to-day practices of everyone in the community. Realizing this very fact and acknowledging a dire need to take actions against climate change and environmental degradation from grass-root level, CRT/N initiated a pilot project for raising awareness called School Education on Energy and Environment Project. The project was conducted in two schools of the Kathmandu Valley viz. Little Angels' School and Himalaya Boarding High

School in May 2011. The project was intended towards reaching out to school students and enabling them to make contribution towards educating greater mass about interrelationship between climate change, energy and environment. Project module was designed for six months to be accommodated into one academic year of the participating schools and required students to commit one class every week whenever possible for six months' period. The duration of the project however, was extended until the end of the academic year 2011-2012 so as to avoid causing disturbance in regular class activities. The project module included several lectures on climate change, environmental issues, gender and energy, Renewable Energy Technologies in Nepal, areas where

community could contribute to combat climate change and various aspects towards environmental protection. In addition to lectures and demonstration classes, the module also included documentary presentation, field trip to ICIMOD Demonstration and Training Centre, movie show, essay competition and project work competition. The project turned out to be a learning experience for the project team and the outcome has been very encouraging. Both schools showed huge interest and cooperation towards the project, which contributed a lot into its successful conduction. Encouraged by the interest shown by students in learning about these grave issues, we intend to upscale this project to more schools in the near future, not only inside the valley, but also in other districts outside the valley.



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# GLOBEL WARMING

*Text By: Aishwarya Lama, Apsara Dahal, Maniraj Thapa, Sunny Gupta  
Photo Source: Environmental Graffiti  
Class 9, HBHS*

## Our earth is becoming unbearably hot, why? What is causing it ? How does it happen?

Everyday when the sunrays reach earth atmosphere, a group of gases called Green House Gases (water-vapor, carbon dioxide, methane, nitrous oxide etc) absorbs heat from the solar radiation and make our planet warm enough for us to survive. If the level of these gases in the atmosphere increases, they will absorb more heat, and make the earth too hot to live. This overheating of the planet is called Global Warming.



Since 1880 earth has warmed up by 0.8 degree centigrade. This increase in earth's temperature has resulted in a rapid melting of ice in Polar Regions, higher sea levels submergence of low lying Islands and flooding of coastal areas. Warmer temperature has also triggered climate change and the extinction of animal and plant and species.

## Is Global Warming really happening?

Yes, earth is already showing many signs of worldwide climate change which have been listed as follows:

- Average temperatures have limed 1.4 degree Fahrenheit (0.8 degree Celsius) around the world since 1880, much of this in recent decades, according to NASA's Goddard Institute for Space Studies.



- The rate of warming is increasing. The 20<sup>th</sup> Century's last two decades were the hottest in 400 years and possibly the warmest for several millennia, according to a number of climate studies. And the United Nation's Intergovernmental Panel on Climate Change (IPCC) report that 11 of the past 12 years are among the dozen warmest since 1850.
- The Arctic is feeling the effects the most. Average temperatures in Alaska, western Canada and eastern Russia have risen at twice the global average, according to the multinational Arctic Climate Impact Assessment report compiled between 2000 and 2004.

- In Asia and some parts of Africa, rainfall pattern (monsoon) is getting more and more unpredictable which is severely hampering the agricultural practices of the regions.
- Glaciers and mountain snows are rapidly melting. In the Northern Hemisphere, thaws also come a week earlier in spring and freezes a week later.
- Coral reefs, which are highly sensitive to small changes in water temperature. With some areas seeing bleach rates of 70%. Expert expects these sorts of events to increase in frequency and intensity in the next 50 years as sea temperatures rise.
- Some experts also attribute an upsurge in the amount of extreme weather events, such as wildfires, heat waves, hurricanes and strong tropical storms in part to climate change.
- As northern countries warm, disease-carrying insects migrate north, taking along plague and disease with them. Indeed some scientists believe that in some countries, thanks to global warming, malaria has not been fully eradicated. One of the local examples is Dhading, where a decade back there was no sign of mosquitoes whereas now, due to increase in temperature, mosquitoes are rampant in this area during summer.



## What's going to happen?

A follow-up report by the IPCC related in April 2007 warned that global warming could lead to large-scale food and water shortages and have catastrophic effects on wildlife.

- Some hundred million people live within 3 feet (1 meter) of mean sea level and much of the world's population is concentrated in vulnerable coastal cities.
- More glaciers around the world could melt, causing sea levels to rise while creating water shortage in regions dependent on runoff for fresh water.



- Sea level could rise between 7 and 23 inches (18 to 59 centimeter) by Century's end, the IPCC's February 2007 report projects. Rises of just 4 inches (10 centimeters) could flood many South Islands and swamp large parts of Southeast Asia.
- More than a million species face extinction from disappearing habitat, changing ecosystem and acidifying oceans.



- Strong hurricanes, droughts, heat waves, wildfires and other natural disasters may become commonplace in many parts of the world. The growth of deserts may also cause food shortage in many places.

- The ocean's circulation system known as the ocean conveyor belt could be permanently altered causing a mini-ice age in Western Europe and other rapid changes.

- It is possible that future centuries could see increased friction between nations and ethnic groups as dwindling resources lead to migration and conflict. Countries and factions would seek to control precious, dwindling resources and provide safety and shelter for their own people – perhaps at the cost of others.



- At some point in the future warming could become uncontrollable by creating a so-called positive feedback effect. Rising temperature could release additional greenhouse gases by unlocking methane in permafrost and undersea deposit, freeing carbon trapped in sea ice, and causing increased evaporation of water.

### Little thing that we can do to reduce it

Plant trees!! The longest living thing on our planet is crucial to the survival of all other living things on the earth.

#### Facts about trees:

1. Trees release oxygen the one element essential to survival of all living things.
2. By absorbing carbon dioxide, trees gradually store carbon in its wood and root system. By removing carbon dioxide, a hazardous greenhouse gas from the atmosphere, trees play a critical role in protecting earth from the climate change that is happening all over the world.
3. An average tree absorbs 1100 kg of CO<sub>2</sub> in its lifetime. Over the years, the world's forests absorb billions of tones of carbon dioxide in the atmosphere.

Global warming... Global challenges... Global solution  
Global warming is a global challenge and we need a coordinated global solution. The basic levels in the solution process start with the individual - **You**. If you plant trees and conserve nature you can save the only planet we have... so go head plant a solution!!

\*Taken from the first prize winner of the Project Work Competition 2011-2012.

### What is a carbon footprint - definition

A carbon footprint is defined as the total amount of greenhouse gases produced to directly and indirectly support human activities, usually expressed in equivalent tons of carbon dioxide (CO<sub>2</sub>).

In other words: When you drive a car, the engine burns fuel, which creates a certain amount of CO<sub>2</sub>, depending on its fuel consumption and the driving distance. (CO<sub>2</sub> is the chemical symbol for carbon dioxide). When you heat your house with oil, gas or coal, then you also generate CO<sub>2</sub>. Even if you heat your house with electricity, the generation of the electrical power may also have emitted a certain amount of CO<sub>2</sub>. When you buy food and goods, the production of the food and goods also emitted some quantities of CO<sub>2</sub>.



Source: [timeforchange.org](http://timeforchange.org)

## What is Climate Change ?

The Earth's climate is not static, and has changed over time in response to variety of natural causes. 'Climate change' refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the average and/or the variability of its properties (temperature, rainfall), and that persists for an extended period, typically for decades or longer. Climate change may be due to internal processes and external forcing. Some external influences, such as changes in solar radiation and volcanism, occur

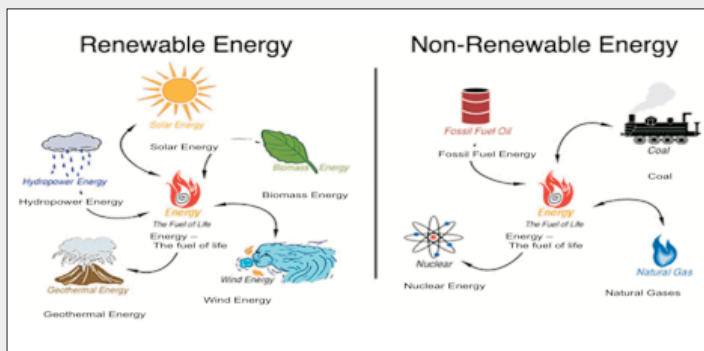


naturally and contribute to the total natural variability of the climate system. Other external changes, such as the change in the composition of the atmosphere that began with the industrial revolution, are the result of human activity. (IPCCC, 2007)

# Renewable Energy Technologies in Nepal\*

Text By: Vikrant Shah  
Class 9, LAS

Renewable energy technologies are the technologies, which use renewable energy resources: resources, which are continuously being produced in nature and replenished. Renewable energy technologies are eco-friendly. The suffocating smog and dust in air, water resources mixed with effluents from industries, thousands of acres of land turning every year into deserts and infertile land-all point to the degrading environment. Though we all study about eco-friendly technologies in academic, they are not implemented or put in practice. The main cause of this is that the intensity of human greed always surpasses conservation activities being carried out.



Renewable energy resources include hydropower, solar power, wind energy, tidal energy, geo-thermal energy, etc. But in the context of Nepal, hydropower, solar power, wind energy, biogas energy etc are the most suitable energy resources.

Nepal is drained by six thousand rivers and rivulets, which are fast flowing. Total potentiality of electricity generation in Nepal is 83,000 MW but not even 1% of that power is produced in Nepal. Big hydel projects should be constructed extracting energy from big rivers like Koshi, Karnali, Gandaki and their tributaries. Micro-hydropower projects should be constructed by involvement of local people. Though it seems expensive to construct such hydropower stations, they become cheap on the long run. Perhaps, this is the best technology for electricity generation in Nepal.

Many places of Nepal (eg. Kagbeni) are the sites that are characterized by fast blowing wind. Windmills should be installed at heights to trap the most energy from the wind in these sites. Electricity can also be generated from these mills or they can be used to process food grains for farmers in remote areas. Windmills can also be used to pump out underground water.

The total solar energy absorbed by Earth's atmosphere, oceans and landmasses is approximately about  $10^{32}$  Joules

energy per second and this energy is radiated in all directions. It is everlasting energy source. Solar-based technologies such as parabolic solar cooker and solar panels should be used to trap this inexhaustible solar energy. It takes about 45 minutes for a parabolic cooker to cook a pot-full of food grains. Photovoltaic cells can be used to produce electricity. At some places, which have scorching sunshine, mirrors should be arranged in a way that they can reflect solar light to boil water in tubes fit in a way that the reflected light is trapped into it. Steam produced may be used to rotate turbines, which in turn can be used into producing electricity or even for running mills to process food grains.

Most of Nepalese people are farmers, which means that many of them rear cattle and grow crops. Dung and agricultural residues can be used to produce biogas by placing them in a vessel, and letting bacteria to decompose organic compound in it. Methane released as a result of this disintegration of complex compounds in the vessel can then be used to cook food. Nepal is rich in forest resources, so biomass like firewood, leaves etc are also can be used in cooking food which saves us from spending large amount of national revenue on importing fossil fuels.

People should not be dependent only on the government for these technologies; their involvement is as cardinal in implementing renewable technologies at local level. Renewable energy technologies should be used in each and every aspects of development. Non-renewable energy resources are environment deteriorating whereas renewable technologies are not only eco-friendly but also cost-effective on a long run. The energy demand is increasing at the rate of 2.4% per year. So if we are not aware of consequences of today's activities, fossil fuels will be shortage in the future. If this trend continues, and when energy resources mostly used today are emptied, our future generations will look upon us and ask, 'Didn't you care?'

*\*This essay received the first prize in the Essay Competition conducted by SEEP*



# Sustainable Development

Text By: Vikrant Shah  
Class 9, LAS

Sustainable development is a term introduced into the world about 4 decades ago. It has been recognized and understood by most of the countries in the world as a process of utilizing natural resources in a sustainable way and at the same time preserving them for the future generation. Sustainable development can be simply known as the proportionate development aimed for conservation and preservation of natural resources. Although, there have been a lot of projects/programs launched around the world as efforts for implementing the concept of sustainable development, it is still not a well-conceived idea in many countries.

The term sustainable development is often associated with slowing down of economic development and reduction in PCI (per capita income) and HDI of any country. But it is a clearly wrong idea, as this practice does not slow down development of a country instead it develops a country's economy through utilization of resources in a balanced way which ensures the use of low natural resources for higher production which is sustainable for country's development, environment and the following generations as well.

There is a widespread rumor that when the Mayan Calendar ends, which is going to be on 21<sup>st</sup> December 2012, the world will come to an end resulting into the destruction of human civilization. Scientists seem to have reservation on this belief but they still believe that world may be not far away from its end if processes like global warming, climate change and resulting catastrophes continue to occur at the same rate as it is now occurring. Such are consequences caused by rapid and unsustainable development that we have favored all these while.

People may think that it might be very difficult to live without rapid development of science and technology but they got to know that unsustainable development cause them to deviate from what is natural. If we deviate too much from nature and exploit resources in a way that harms nature, it may lead to a permanent loss of natural resources and cause climate change, destruction of flora and fauna, loss of species, change in ecosystem processes and global warming etc.

## The sustainable development has many advantages like:

1. The development is very long lasting.
2. It does not hamper the natural processes too much and embraces eco-friendly principles for development.
3. It ensures the availability of resources for future generations as well.

For the process of sustainable development any country requires skilled human resources, infrastructures, sufficient capital, proper planning which in our country are lacking. The major hindrances for sustainable development are:

1. Lack of capital
2. Unstable government
3. Lack of appropriate technique in development work.
4. Lack of proper planning.
5. Lack of skilled manpower.

## The solutions of the sustainable development in our country are:

1. Government should provide adequate budget for sustainable development.
2. Stable government
3. People's participation should be encouraged.
4. Proper planning should be done.
5. Awareness about sustainable development at all levels.



There is a saying that "With great powers come great responsibilities". In our relation it means that earth has given us great power to live, play, eat and make use of resources. It is now our responsibility to develop, conserve and protect our earth. The world's faith rests on our (young generation's) hands,

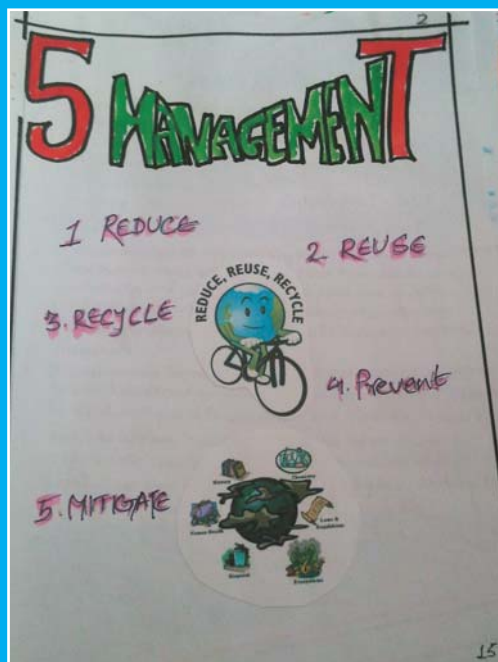
it's what we do that will reflect in our future. If we use our natural resources in best level and preserve them for future generation, we can stop the apocalypse from happening and if we don't, the world will not remain for safe utilization.

Most of the people of today's generation do not understand that if they use resources lavishly and consumption rate outnumbers production rate, in the future, nothing will be left for the upcoming generation. Therefore, people should be made aware of this important truth and encouraged to reduce the unnecessary and undue use of resources. We have to explain the concept of sustainable development to people only then they will think for the future. Only explaining the concept of sustainable development is not sufficient, they must also be encouraged to take action from their level. If everyone becomes aware of this concept and starts acting, then definitely the future generation will also get a chance to enjoy the privileges that nature has bestowed upon us, human beings.

*\*This essay (merged version of essays by Saurav and Aakash) received the second prize in the Essay Competition conducted by SEEP*

# Some facts about Climate Change

*Text By: Ramesh Lama (HBS)*  
*Cartoon: Ayushi Shrestha Dangol (LAS)*  
Class 9



## Impacts of climate change and global warming in Nepal

- Glacier melting
- Adverse impacts on water resources and hydro – power plants.
- Increasing rainfall pattern change and its effects on agriculture.
- Forest and biodiversity
- Health
- Insects outbreak

## Causes of Climate change and global warming

- Burning of fossil fuel.
- Solid wastes and their treatment plants.
- Land use pattern change.
- Fossil fuel vehicles
- Use of chemical fertilizers.
- Industrial activities.
- Decay of organic wastes.

## How to reduce the effect of climate change and global warming?

- Switch to renewable energy.
- Switch to low carbon technologies.
- 3Rs.
- Reduce the use of resources.
- Reuse used resources unit they become out of order.
- Recycle the used resources.
- Population control.
- Awareness, sharing knowledge.
- Stop the unnecessary use of automobiles.

# Plant Trees !

*Text By: Ayushi Shrestha Dangol*  
Class 9  
LAS

Environment is the surrounding where we live and survive. Land, water, air, plants, animals, solid wastes and other things that are surrounding us constitute our environment. Man and environment are closely intertwined with each other, to maintain a balance or equilibrium in nature. We human beings are social animals. For our survival and needs, we've used the things available in the nature. But now we have been taking it for granted. We have to learn to give something back and not only take away from it to meet our needs. This is the basic formula to sustain the trade between human and nature.



Trees are key components of the nature, and of water cycle and several other bio-geochemical cycles. Plant roots play an essential role in soil development and prevention of soil erosion.

One has to plant trees in a lifetime but only by planting trees is enough. We may plant as many trees but if we don't care for it what is it worth of ? Nothing. Rather we can plant at least one tree and take care of it, water it and that will make more sense. The photosynthesis conducted by trees provides ultimate source of energy and organic material for all ecosystems. Photosynthesis radically changed the composition of the early Earth's atmosphere, which as a result has now 21% oxygen from 0% some millions of years ago. Animals and most other organisms are aerobic, relying on oxygen. Plants are the primary producers in most terrestrial ecosystems and form the basis of food web in those ecosystems. Many animals rely on plants for shelter as well as oxygen and food. It's not only the nature we have to save but the biodiversity as well, which includes all the animals, birds, insects etc.

Climate change is in the news. It seems like everyone's "going green." Environmental protection is a major concern in today's society. Environmentalists are concerned about the environment in its relation to human society. We the new generation should lend our hands to them in turning deteriorating world into a green and clean world.

To conclude with, we have to create a culture of environmental responsibility across the nation. We shall put all our efforts to go green and protect our green world, which will in-turn protect coming generations and the environment for years to come.

# Rights for Water and Sanitation

Compiled By: Saurav Dev  
Class 9  
LAS

The Programme of Action of the UN International Conference on Population and Development affirms that all individuals:

- “Have the right to an adequate standard of living for themselves and their families, including adequate food, clothing, housing, water and sanitation.

The Political Declaration of the Summit states

- “We welcome the Johannesburg Summit focus on the indivisibility of human dignity and are resolved through decisions on targets, timetables and partnerships to speedily increase access to basic requirements such as clean water, sanitation, energy, health care, food security and the protection of biodiversity”.

General Comment 15 interprets the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR) confirming the right to water in international law. This Comment provides guidelines for the interpretation of the right to water, framing it within two articles, the right to an adequate standard of living, and the right to the highest attainable standard of health. The Comment clearly outlines States parties' obligations to the right and defines what actions would constitute as a violation. It states that, “The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights”.

Sanitation is the hygienic means of promoting health through prevention of human contact with the hazards of wastes.

Hazards can be physical, microbiological, biological or chemical agents of disease. Wastes that can cause health problems are human and animal feces, solid wastes, domestic wastewater (sewage, greywater), industrial wastes and agricultural wastes. Hygienic means of prevention can be by using engineering solutions (e.g. sewerage and wastewater treatment), simple technologies (e.g. latrines, septic tanks), or even by personal hygiene practices (e.g. simple hand washing with soap).

The World Health Organization states that: "Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and feces. Inadequate sanitation is a major cause of disease worldwide and improving sanitation is known to have a significant beneficial impact on health both in households and across communities. The word 'sanitation' also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal. In this resolution, the Human Rights Council welcomes the consultation with the independent expert on the issue of human rights obligations related to access to safe drinking water and sanitation, acknowledges the independent expert's first annual report and, for the first time, recognizes that States have an obligation to address and eliminate discrimination with regard to access to sanitation, and urges them to address effectively inequalities in this area. This states that people should get equal rights for water and sanitation and everyone should utilize in optimum level. People should understand the value of time and environment.

## Green house gases (GHGs)

Text By: Aishwarya Lama, Apsara Dahal, Maniraj Thapa, Sunny Gupta  
Class 9, HBHS

Gases are those gases that trap the solar radiation from the atmosphere. There are 6 types of GHGs known till date, which have greatest impacts on climate change phenomena, they are:

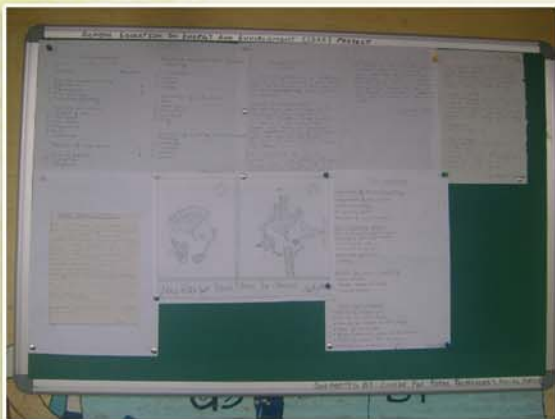
1. Carbon Dioxide (CO<sub>2</sub>)
2. Methane (CH<sub>4</sub>)
3. Nitrous Oxide (N<sub>2</sub>O)
4. Fluorinated Gas
5. Water vapor
6. O<sub>3</sub>

### Source of GHGs

- Carbon dioxide (CO<sub>2</sub>): Burning of fossils fuels, solid waste, trees and wood products, land-use pattern change
- Methane (CH<sub>4</sub>): Coal, natural gas and oil. Other agricultural practices, decay of organic waste.
- Nitrous Oxide: Burning of fossils fuels and solid waste, chemical fertilizers
- Fluorinated Gas: Industrial activities.
- Water vapor: water cycle, various industrial activities
- O<sub>3</sub>: Chemical reactions in the atmosphere.







# Ways to protect environment

Text By: Aashish Adhikari  
Class 9, LAS

Environment is simply the surrounding in which we live. In other words, environment refers to the nature where all the living organisms interact with its physical as well as biological aspects. It is through the use of resources available in it that human beings and the entire living organisms are able to live their lives. The things available in the nature like air, water and shelter are essential for our lives. Without these things our life is not possible.

Environment provides us with basic as well as extra needs, not only us but also the whole living organisms are being benefitted from it. Since Stone Age, human beings have been using the natural resources for various other things than for fulfilling their basic needs. In coming to present age, human beings have used up many resources and destroyed nature to a great extent. Nature decides what share of resources go to which organism; exploiting more than what is decided for us, we have imbalanced its equation. As a result, we are today facing a lot of environmental problems.

Realizing the need to save the environment and conserve nature, many governmental and non-governmental organizations have been established to work for the protection and promotion of the environment. Effort from government and other organizations alone is not enough to protect environment. Efforts must be made from the grass-root level to stop degradation of the environment. Resource-efficient practices should be brought into use for the effective conservation of the environment. To save the environment we can minimize the production of non-degradable waste and can also recycle the things like paper, plastic etc. We should organize awareness programs especially among youth so that they can work towards preservation and protection of the environment.

The government should also implement strict laws and regulations in the country so that the people are

discouraged to perform any environment-unfriendly activities. The youth being the future of the country should be provided vocational as well as practical education on conservational activities so that they can actively participate in saving the environment. Moreover, every people should throw their domestic wastes in the proper place and the government should also establish collection facilities for the proper waste collection and disposal. People in the remote areas should also be educated about this matter so that they also use the natural resources wisely in an effective way. Due to global warming and climate change, environmental conservation has come up as an important concern. Therefore, in the school curriculum, environment, climate change and global warming should be introduced from the very beginning so that students can start working on it from the very beginning of their school days. By conducting various awareness programs, we can also educate more people about this issue and get them to work towards conservation and protection of the

environment. If everyone becomes conscious about the importance of environment, saving the environment will not be a very difficult job.

## Facts about fuel wood consumption in Nepal

### Country Status

Overall, 77% of households in Nepal still depend on solid fuel for cooking and heating with the largest percentage of this group using wood gathered from forests and private land. The smoke released by burning solid fuels such as wood, charcoal and dung is one of the major causes of carbon emissions and uncontrolled fuel-wood collection is one of the major reasons for forest degradation.



Table: Distribution of households by fuel used for cooking

Ecological Zone	Major Sources of fuels for cooking in Nepal (in %)						Total No. of Households
	Wood	Korosene	LPG	Biogas	Cow Dung	Other	
Mountain	95.5	3.2	0.4	0.1	0.7	0.2	285,229
Hills	72.3	16.0	8.9	1.9	0.1	0.8	1,950,822
Terai	55.6	12.8	7.7	1.7	21.5	0.7	1,938,477

Source: Population Census 2001

## Ways to reduce firewood consumption

Improved Cook Stoves, Briquettes and Biogas, however, may be able to reduce this dependency if promoted through project interventions. Without large financial support, the poor cannot afford to set up biogas plants nor do they have sufficient numbers of cattle to produce the dung required to run them. There are some limitations associated with biogas in the high hills and mountains due to the cold climate as cold temperature hinders the biological reactions necessary for biogas production. Bio-briquettes, on the other

hand, are cheap and may have greater potential in all of the ecological regions. Similarly, clean and improved cook stoves also have a great potential, as it is cheap, simple and can save large amount of fuel as compared to traditional cook stoves.



# School Education on Energy and Environment Project

*Text By: Rahul Jha and Aman Shah  
Class 9, LAS*

Centre for Rural Technology/Nepal is one of the non-governmental organizations of Nepal working towards the development of the country through promotion and development of renewable energy technologies in rural areas of Nepal. Among many developmental projects that it undertakes, School Education on Energy and Environment (SEEE) is one of its project through which it is trying to raise awareness among public about energy, environment and climate change. This project selects certain schools and aware students about the impact that our activities can have on the environment and climate, so that they can share the information with their friends and family members and aware them as well. In 2011, this project was conducted in Little Angel's School of Lalitpur and Himalayan Boarding School of Kathmandu districts. This project was a 6 months long project and the project module was divided into many segments. This project module included listening classes, field visit, movie show and different competitions.



SEEEP is an educational project, which gives students important information about environment, energy resources, climate change and how we can save the earth from bad effects of climate change. With the help of SEEEP, we learned about environment, Renewable Energy Technologies, Climate Change, Carbon Footprint, Carbon Emission, Sustainable Development, Vermicomposting, 3Rs of waste management and many more. Very important things that we learned about during SEEEP classes are causes and consequences of climate change and activities to minimize them. We also learned how to utilize energy and save it for future generation. Under this project, we were also taken to ICIMOD where we studied briefly about different things in addition to what we learned about in class.

They prepare slides on the topic that are discussed in the class and they also provide printed copy of the presentation so that students can always go back and revise. Power-point presentation is a very good way of teaching. Apart from teaching through a presentation, the SEEE project showed us various documentaries,



movies, take us on field trip to places like ICIMOD, etc. which gives us practical knowledge about the things that we discuss in the class. As practical knowledge is more effective than theoretical one, this type of teaching and learning process is a very good way of gaining proper knowledge about the things that have great importance in our lives. In school, teachers teach us about various things that may be or may not be useful in our future. But the things taught by the SEEE project will certainly be useful, if not now then in the future it certainly will.

## Quotable Quotes

*Compiled by: Ayushi Shrestha Dangol  
Class: 9, LAS*

In an underdeveloped country, don't drink the water; in a developed country, don't breathe the air.  
*-The times magazine*

We have modified our environment so radically that we must now modify ourselves to exist in this new environment.  
*-Norbert Wiener*

If all mankind were to disappear, the world would regenerate back to the rich state of equilibrium that existed ten thousand years ago. If insects were to vanish, the environment would collapse into chaos.  
*-Edward O. Wilson*

The human race will be the cancer of the planet.  
*-Julian Huxley*

# An educational Tour To ICIMOD Demonstration and Training Centre

Text By: Vikrant Shah and Bishal Shrestha

Photos By: SEEEP

Class 9, LAS

We, the students of class 9 'A1' and 'A2', were taken to ICIMOD Demonstration and Training Centre in Godavari, Lalitpur on 3 February 2012. At 10:30 am we reached our destination. The objectives of our tour were:

- To learn and observe the eco-friendly technologies and methods that we discussed about in the class.
- To learn about the importance of various species in the environment and to learn as how they can benefit the livelihoods of rural population.
- To analyze the impacts of our activities on the environment.

ICIMOD stands for International Centre for Integrated Mountain Development. It occupies over 600 *Ropanies* of land in Godawari provided by the government. The objectives of its establishment is to develop and uplift

the living standard of people residing in Hindu Kush Himalayan area. ICIMOD has its offices in eight countries in this area- Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan.

Mr. Samden Sherpa from ICIMOD Demo and Training Centre guided us around the centre and provided us with very useful information about the Centre, technologies in the centre and about various other works that ICIMOD has been doing in Himalayan regions.

Our tour started with a walk around a very small botanical garden where we saw 'Paulownia tomentosa', a nitrogen fixing plant. It is a tall tree with white bark. Its wood is used in making plywood, musical instruments etc, and it was first brought in Nepal from China.

It makes soil fertile and is highly efficient in taking in CO<sub>2</sub> and giving out O<sub>2</sub>, thereby reducing CO<sub>2</sub> concentration from the atmosphere. Other medicinal plants that we saw during our walk were Timur, Tejpat, Keri, Majitho, Sarpagandha, Khareto, Fox clove, kukur daino, Asuro, Pudina, Peppermint, sweet flag bojho, chiretta etc.

During our walk around the garden, Mr. Sherpa shared information about different agricultural techniques practiced in the centre. There is Asian Honeybee (*Apis cerana*) farming. These honeybees derive their food or nectar from flowers of

different kinds of plants in the garden. These bees also help in pollination of plants. The centre also has Kiwi plantation. Kiwi fruit is rich in Vitamin C and E. It is a climbing plant and can be grown in a shade made by 'T' and 'Y' shaped poles. The fruit can be harvested during November.

Animal husbandry is also one of the major occupations in mountain regions. The centre has a number of animal types being reared and Mr. Sherpa shared with us as how we can earn money from animal husbandry. The centre has a lot of animals like goats, rabbits, and earthworm, all reared for specific purposes. There were two types of goats, one that gives meat and another that gives meat as well as milk. Mr. Sherpa said that animal droppings from animal husbandry could be used in Puxin Biogas Plant to produce gas, which can be used for cooking. There were Aungora rabbits (German), which are high wool producing breed, producing about 0.6-1.0 kg of wool per year by a rabbit. We also saw fish farming in the pond where water from rainwater harvesting was collected. We saw 'rainbow trout'. It is one of the most expensive breeds of fish costing around NRs. 1200/kg. It needs oxygen amounting to 7mg/lit.

We also saw a practical demonstration of Pusa Vermitech Composting where earthworm is used to convert biomass wastes into manure. About 1000 earthworms can produce about 5 kg of compost everyday if adequate biodegradable waste can be supplied to them. Vermi compost does not only increase the fertility of land, but also provides nutrition to plants and increases water-holding capacity of the soil.



ICIMOD's vision and mission: Artwork taken from Ayushi's Project Work



Students observing Solar-based technologies

The centre has a collection of renewable energy technologies available in Nepal. We were guided through a site where they have various solar, biomass and hydro-based technologies. They have display of various technologies based on solar energy such as Passive Solar Heating technologies: Solar Parabolic Cooker, Solar Aqua Still, *Sasto* Solar Dryer and Solar Oven. Solar Parabolic Cooker in the site can cook food in about 45 minutes and Solar Aqua Still can filter about 6 liters of water per day. These technologies do not pollute environment and

are the best approaches towards cost saving. During our tour, we also learned about a pico-hydropower generation which needs a water flow rate of about 1 liter per sec to produce electricity of about 200 watts. We learned about Hydraulic Ram Pump about which we learned in the SEEEP class as well. Hydraulic Ram Pump can be used to irrigate water in small lands. We also learned about beehive briquetting, which is made from charcoal derived from biomass. It is used to produce heat energy for cooking food and warming.

We also learned about 'Naya Cool Chamber'. It is also known as 'natural fridge', which can be

built by building walls from bricks standing at a height of 1m. It has two walls made up of bricks with a gap within them filled with sand. Water is poured on to sand three times a week to keep the chamber cool. The cool chamber should be built under a shade. We also learned about rooftop rainwater harvesting and fog harvesting techniques, which can be very useful in areas where there is scarcity of water.

We also saw mushroom farming being carried out in the holes made in wood

logs. The mushroom costs around NRs. 800-1000/kg and is exported to many cities and has been one of the sources of income for ICIMOD. We also learned about various agricultural techniques such as Slope Agricultural Land Technology (SALT). It is highly preferred agricultural practice in Himalayan regions where there is a high risk of landslides and soil erosion.

In this method, plants that are deep-rooted and big are planted along the marginal lands. These plants are mostly nitrogen fixing but they are cut at the apex to prevent them from growing enormously.

In addition to various techniques and technologies, we also learned about meteorological data recorder, sun power recorder and other machines used to measure weather conditions and wind direction.

ICIMOD has been contributing a lot in the conservation of flora and fauna and the environment through promotion of sustainable practices. It has also been training and raising awareness about techniques which can be used by farmers and which are environment friendly as well. In overall, the excursion to ICIMOD was really interesting and we learned a lot of things from this trip. The way they have managed the centre and technologies and techniques is really inspiring and appreciable.



Students observing Naya Cool Chamber



ICIMOD staff explaining students about Roof-top Rainwater Harvesting System

# Winners of the SEEP Project Work Competition 2011-2012

## First: Report on Climate Change, Global Warming, Their Effects on Livelihoods and Ways to Combat It

By the group of Maniraj Thapa, Sunny Gupta, Aishwarya Lama, Apsara Dahal – HBHS

The group from HBHS produced a report that comprehensively elaborates on various aspects of Climate Change and Global Warming. With a collection of events from around the globe, they have presented as how climate change is a global phenomena and how it has been affecting the livelihood of people. In their report, they provide a brief overview on renewable energy technology options and rainwater harvesting as mitigation and adaptation measures for climate change. Although different subjects and issues have been randomly put into the report, the report in overall looks very interesting and informative. This report clearly suggests the hard work and research they have put into preparing it.

## Second: Play called 'Shitalko Sapana Sakar Hunchha'

By the group of Sujan Raut, Sanjeev Tamang, Mausam Ghatani, Surendra Khadka, Suraj Lama, Nabin Pokharel- HBHS

The group produced and played a very beautiful play with a theme that youth can do anything if he/she has enough commitment to change and to making a difference. It is a story of a young chap who does not choose to waste his time on unnecessary and unhealthy habits as most of his fellow youth, instead he explores all by himself the ways to develop his village and improve the livelihood of the village people. Although short and abruptly skips from one scene to another, the play is definitely an eye-opener for youths who only complain about their villages but never take initiative towards changing the trend and making difference. Hats

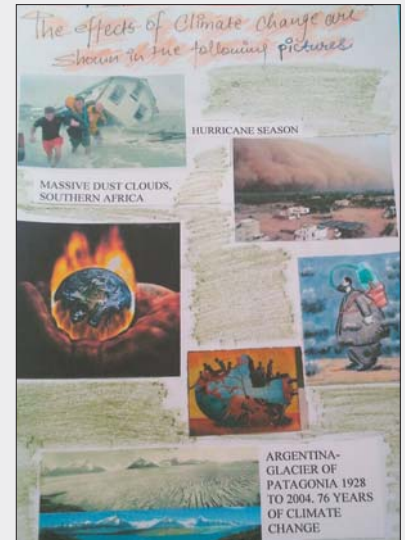
off to Nabin Pokharel who did a great narration and played Mr. Chairman (of the developmental organization from where he gets help), and a great job by Sujan who played Sheetal.

## Third: An Investigation Report on ICIMOD

By Ayushi Shrestha Dangol- LAS

Ayushi's report highlights on the objectives, mission and works of ICIMOD that she learned about during her visit to ICIMOD demonstration and training centre at Godawari. Her report is one beautiful artwork, which has been embellished with a lot of colors, pictures, newspaper pieces and souvenir (herbarium of leaves) she collected from ICIMOD. In addition to explaining about ICIMOD and what she saw during her trip there, she has also

included some of very interesting things in her report such as a brief conversation she had with Mr. Samden Sherpa, collection of newspaper articles on environment and renewable energy technologies and most importantly a feedback to SEEP.



## Winners of the SEEP Essay Competition 2011-2012

First: Renewable Energy Technologies in Nepal  
By Vikrant Shah, Class 9, LAS

Second: Sustainable Development  
By Saurav Dev and Aakash Pandit, Class 9, LAS

Third: School Education on Energy and Environment Project  
By Rahul jha, Class 9, LAS

# Evaluation of SEEEP by Ms. Geeta Karki

(Based on the questionnaire administered to her by SEEEP team)

Ms. Geeta Karki is a Faculty Head of Health Population and Environment Department at Little Angels' School, Hattiban, Lalitpur. She was present in all SEEEP classes with students and played a crucial role in making this project successful.

**Question:** What do you think this project is all about ?

**Ms. Karki:** Environment, Renewable energy technologies and Climate Change.

**Question:** Did you participate in any way in this project ?

**Ms. Karki:** Yes. I was with students most of the times during the project period at LAS.

**Question:** What would you change in the project module if you could ?

**Ms. Karki:** Less theory classes, more participatory classes, intense environment- based short documentary shows, ½ day educational tour only just like ICIMOD trip.

**Question:** What do you have to say about the project duration?

**Ms. Karki:** A bit long, it made sometimes difficult for us to make time for other academic courses.

**Question:** Do you think activities were well planned from CRT/N's side? If no,

what do you think was the weakest point of the organizer ?

**Ms. Karki:** They had well-planned activities. Just that we could not manage time and had to face problem often times regarding period management.

**Question:** Have your students ever shown interest in bringing issues talked during their classes under SEEEP in your class?

**Ms. Karki:** Yes, most often topics were discussed as they were interrelated.

**Question:** How did you find the teaching methods of SEEEP instructors ?

**Ms. Karki:** Interesting, but can be made better with extra efforts, eg. Sound, individual speaking techniques, etc.

**Question:** How do you think your students have benefitted from the project?

**Ms. Karki:** Got practical knowledge about day-to-day life on environmental issues like energy, waste management, vermi-composting, etc.

**Question:** Have your students shown disinterest in your studies because they were too engaged in SEEEP activities?

**Ms. Karki:** No, instead its been helpful.

**Question:** Do you think the field trip to ICIMOD Demonstration and Training Centre was knowledgeable/relevant to SEEEP?

**Ms. Karki:** Extremely knowledgeable and relevant. Enjoyed a lot.

**Question:** Do you think it would make difference if this kind of project could be run in other parts of the country and in other schools too?

**Ms. Karki:** Certainly. It should be run in other schools too but must be flexible depending upon schools' convenience not only upon that of project alone.

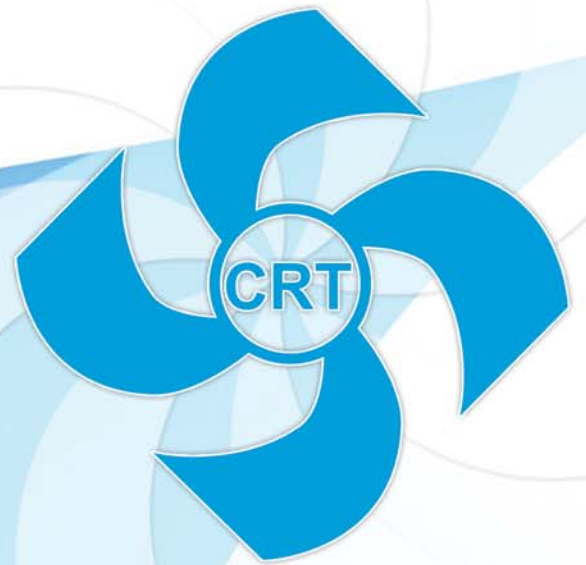
**Question:** Would you please point out two strong points about SEEEP?

**Ms. Karki:** Newness in the method for school besides opportunity to learn. Assisting in curriculum. Golden opportunity not only for students but also for teachers to learn.

## Acknowledgement

This book reflects the hard work, diligence and creativity of a lot of people involved directly or indirectly in making SEEEP a successful journey. Students and teachers of Himalaya Boarding High School and Little Angels' School along with staffs of CRT/N have fully supported the project team in development and implementation of this project and have provided worth mentioning cooperation in bringing out this issue of SEEEP Book. Therefore, we would like to acknowledge their faith on us and offer our appreciation for their incessant support in producing this magazine. Special thanks to Ms. Geeta Karki for her valuable suggestion and advice regarding the publication of SEEEP Book.

# crt/n



## About us

Centre for Rural Technology, Nepal (CRT/N) is a professional non-governmental organization involved in developing and promoting appropriate/rural and renewable energy technologies effective in improving livelihood of the rural mass. It was established in August 1989 under the Company Act. CRT/N has now been registered with the Government of Nepal (GoN) under the Social Organization Registration Act since October 1998.

## Vision

Communities living with commendable quality of life through adoption of environmentally sound rural/appropriate technologies that emphasize optimal use of locally available skills and resources.

## Mission

Develop, promote and disseminate environmentally sound rural / appropriate technologies and strengthen capability of rural communities in creating better opportunities through use of local resources to improve their livelihood conditions.

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