

## CLEAN ENERGY NEPAL (CEN)'S FACT SHEET # 2

# Climate Change: Nepalese Perspective

## 1. Background

### **Climate Change:**

The effect of heat trapping due to the increasing presence of greenhouse gases (GHG - i.e. Carbon Dioxide, Methane, Nitrous Oxides, Ozone and Chloro-fluoro Carbons) in the earth's atmosphere is known as greenhouse effect. This greenhouse effect causes global warming, a temperature increasing process due to the heat trapping by the built up of green house gases in the earth's atmosphere and its main consequence is climate change.

Studies have shown that over the last few decades temperature of earth surface has been rising and this has caused changes in weather patterns, rise in sea level and melting of glaciers. Meteorological measurement records indicate that a warming of 0.3-0.6 degrees Celsius in global average temperature since 1860. Similarly, it is also recorded that 1990s was the warmest decade and year 1998 was the warmest year on record. The Intergovernmental Panel on Climate Change, a panel of 2000 scientists, determined that even if we take steps now to reduce our emissions of greenhouse gases, the globe could warm up at a rate faster than it has in the past 10,000 years.

Carbon dioxide is the most important GHG, forming 80% of the world's GHG emissions in 1990. It is principally produced by the combustion of fossil fuels such as oil, coal and gas to produce energy. Rapid industrialization powered by fossil fuel over the past 200 years has resulted in a

dramatic rise in the amount of carbon dioxide in the atmosphere from 0.028% to 0.036 %. Once released carbon dioxide remains in the atmosphere for about 100 years.

The developed countries are mainly responsible for global warming and they need to take concrete steps to reduce their greenhouse gas emissions. However, as climate change will effect everybody, the entire global community needs to work together to address this major problem. In 1990, quarter of the world's population living in the developed world contributed about three-quarters of the world's carbon dioxide emissions. The United States (US) alone produces about a quarter of the world's total greenhouse gases.

### **International Negotiations**

Realizing the urgent need to address the issue at the global level, The United Nations Framework Convention on Climate Change (UNFCCC) was signed by 154 countries, at the 1992 Earth Summit in Rio. UNFCCC lays out broad principles, norms, goals and institutional mechanisms for taking the negotiations further (which is done at the annual Conference of Parties or COP), but does not make specific binding commitments.

So far, seven COP meetings of UNFCCC have been held. The most important, and controversial was COP 3 in 1997, which introduced the Kyoto Protocol where developed countries agreed to specific targets for cutting their emissions. Kyoto Protocol however only comes into force when 55 countries ratify it including countries responsible for at least 55% of greenhouse emissions of industrialized countries (Annex 1 countries). This has not yet happened because rich countries, particularly the US which is responsible for 36 percent of the greenhouse gas emission of Annex 1 countries, are unwilling to compromise their lifestyles. It is estimated

that in 1996, one American was responsible for producing as many GHG as 269 Nepalese. However, recently the second largest polluter, Russia, has expressed its intent to ratify the Kyoto Protocol. This means that the Kyoto Protocol can be implemented even without the United States.

## **2. Climate Change and its Impacts in Nepal**

Although, Nepal's total GHG emission share is negligible compared to global community, Nepal has already encountered some of the negative effects of global climate change. Burning of fossil fuel resulted in 1996 a total CO<sub>2</sub> emission of 3.02 million tonnes. Studies done by Department of Hydrology and Meteorology show that average temperature in Nepal is increasing at the rate of approximately 0.06 degrees Celsius per year. The temperature in the Himalayas, however, is increasing at a faster rate, which is having serious impacts on the countries glacial lakes, which are the main source of Nepal's water resources. The *Rika Samba* Glacier in the Dhaulagiri region is retreating at a rate of 10 m per year. This is very unusual as glacial movement is usually measured in millimeters. Similarly the AX010 Glacier of Shorong Himal will be extinct by 2060 if the current global warming trend continues (Pokhrel 2002). UNEP has warned that more than 40 Himalayan glacial lakes were dangerously close to bursting because of the ice melt caused by global warming. Rapidly melting glaciers means more seasonal variation in river flow, which will in turn result in more floods and draughts in the country. This will also result in more Glacier Lake Outburst Floods (GLOF), which can be disastrous to communities and infrastructure along the rivers. Other impacts of climate change can be reduced agriculture production, loss of biodiversity, increased desertification and changes in social structure.

On the positive side, Nepal has about 29 percent of its total area covered by forest, which are known to be good absorbers of the Greenhouse gases mainly Carbon Dioxide (CO<sub>2</sub>). Nepal is therefore contributing towards reducing greenhouse gases with the increased cover of land by forest.

## **3. Nepal's Response to Climate Change**

Although Nepal signed the UNFCCC on June 12 1992, it has not yet ratified the Kyoto Protocol nor taken any concrete steps towards controlling greenhouse gas emissions or mitigating the impacts of climate change. Recently, however some research work is being done on the impacts of climate change and some NGOs are involved in raising awareness on this issue.

The government has formed a committee to enable the activities for the preparation of Initial National Communications, as required by the UNFCCC. This committee includes study teams for Greenhouse Gas Inventory, Vulnerability, Impact Assessment & Adaptation, Mitigation Option, and National Action Plan & National Communication.

While Nepal does not have any policies on climate change, it does have some policies and programmes to promote clean energy and energy efficiency. The Alternative Energy Promotion Centre, together with several NGOs and private companies, is promoting technologies such as biogas, micro-hydro and solar through subsidies as well as technical assistance. These technologies are gaining popularity among the rural communities in Nepal. In urban and semi-urban areas, however, the use of fossil fuel is increasing rapidly, particularly in the transportation sector. The annual consumption of petroleum products in Nepal is increasing at a rate of about 13 percent per year.

A promising alternative to the fossil fuel based vehicles is electric vehicles (EVs). Nepal is ideal for promotion of electric vehicles because they use hydropower, a local and clean resource instead of imported fossil fuel, and the driving conditions (short distances and relatively slow speeds) are suitable for EVs. Kathmandu now has approximately 600 zero-emission electric vehicles and there is potential for a lot more, provided that the government policies are favourable.

The fact that Nepal does not produce significant amount of greenhouse gasses and it has huge potential for promoting clean energy puts it in a very favourable position in international negotiations. Nepal can become a model in climate change forums if it were to become a bit more aggressive in promoting clean energy. Besides gaining political mileage, this would also lead the country towards sustainable development.

Nepal can also take advantage of the global climate change negotiations by using the Clean Development Mechanism (CDM) as a source of new investment and technology. CDM allows developed countries to meet a certain percent of their liability to cut down emissions by investing in emission-reducing projects in developing countries. Nepal can therefore be "paid" for its efforts in reducing greenhouse gases while at the same time promote clean energy and sustainable development in the country.

A potential project for obtaining funding through the CDM is the Ring Road Trolley bus project in Kathmandu. Currently, operating electric buses in Ring Road is more expensive than operating diesel buses because the trolley bus system requires additional infrastructure. A study done by Winrock International, however shows that the Ring Road Trolley Bus Project can save 547000 tons of CO<sub>2</sub> or 149,000 tons of carbon over the life time of the project. This amount of carbon can be traded in the global carbon market to finance part of the

cost of the project. Other potential CDM projects could be subsidies for biogas and other forms of renewable energy. However, in order to take advantage of CDM, Nepal needs to be prepared with studies, proposals and appropriate institutional mechanisms (Pandey 2002).

While limiting its greenhouse gases, Nepal also has to take steps to mitigate and adapt to the impacts of climate change. Regardless of what happens to the Kyoto Protocol, it is certain that the global temperatures will continue to rise. It is said that there needs to be reduction of at least 60 percent (from 1990 level) of the total global GHG emission to stabilize the level in the atmosphere. It is very unlikely that this will happen anytime soon. Nepal, therefore needs prepare itself for the impacts. This requires additional research and immediate action.

#### **4. The Way Ahead**

It is now clear that global temperature is increasing and climate change is a real threat. Although Nepal is not really responsible for this phenomenon, we are going to suffer from its consequences. Nepal therefore needs to take effective action at local as well as global levels to address this issue. In the days ahead, Nepal needs to take the following steps:

- I. Ratify Kyoto Protocol and actively participate in the international dialogues
- II. Conduct research on Climate Change and its impacts
- III. Explore options to use CDM mechanism to finance clean technologies
- IV. Set up institutional mechanisms to deal with issues related to climate change.
- V. Raise awareness on Climate Change and global negotiations.

## 5. For more information

### Ministry of Population and Environment

Mr. Janak Raj Joshi  
Singha Durbar, Kathmandu  
Tel: 977 1 245 368/369  
E-mail: [janak@espsmope.com.np](mailto:janak@espsmope.com.np)  
URL: <http://www.mope.gov.np/>

### International Centre for Integrated Mountain Development (ICIMOD)

Dr. Kamal Rijal  
Jawalakhel, Lalitpur  
Tel: 977-1-525313, 536739  
E-mail: [krijal@icimod.org.np](mailto:krijal@icimod.org.np)  
URL: <http://www.icimod.org.sg>

### Department of Hydrology and Meteorology (DHM)

Dr. Adarsha P. Pokhrel  
Director General  
Babarmahal, Kathmandu  
G.P.O. Box 13394  
E-mail: [adarsha@dhm.gov.np](mailto:adarsha@dhm.gov.np)  
URL: <http://www.dhm.gov.np/>

### Winrock International/Nepal

Mr. Bikash Pandey  
Country Representative  
Baneshwor, Kathmandu  
Tel: 977-1-472839, 476101  
E-mail: [bpandey@winrock.org.np](mailto:bpandey@winrock.org.np)  
URL: <http://www.winrock.org.np/>

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Clean Energy Nepal (CEN) is a non-profit organization involved in research based education and advocacy campaigns. Fact Sheets are produced by CEN for informing the public, as well as decision-makers on the current state of affairs and the required actions. This Fact Sheet was prepared by Anil K. Raut and Bhushan Tuladhar in July 2002 and updated in October 2002. For more information please contact us at:

Clean Energy Nepal (CEN)  
254 Sahayog Marg  
Anamnagar, Kathmandu, Nepal  
P. O. Box 8846  
Tel/Fax: 977-1-242381  
E-mail: [cen@mos.com.np](mailto:cen@mos.com.np)