



South Asian Network for Development
and Environmental Economics

NEWSLETTER

No. 17

Fall 2008

SANDEE....

The South Asian Network for Development and Environmental Economics is a regional network that brings together analysts from across South Asia to address its environment-development problems. SANDEE's mission is to strengthen the capacity of individuals and institutions to undertake research on the inter-linkages among economic development, poverty, and environmental change and to disseminate practical information that can be applied to development policies.

In This Issue

From the Editors	1
Research News	2
New SANDEE Grants	2
Research Completed	3
Publications and Presentations	6
Focus	8
Discussion	9
Eco-news	12
SANDEE Activities	13
Other News	14



© Sudeep Thakuri

Editorial:

Dear Friends and Colleagues

You will notice that our newsletter has a new look. We hope you like it and are motivated to read the newsletter from cover to cover. This change isn't just cosmetic- we have also changed the way we plan to deliver news to you. We are gradually moving towards a topic focused newsletter and the next few editions will carry information on different eco-systems.

Mountain ecosystems, their wealth and fragility, are at the center of this edition. Our "Focus" is written by Andreas Schild, the Director General of ICIMOD, who discusses the Hindu Kush Himalayan region and the challenges it faces. We follow this with various discussions from SANDEEites from around South Asia. Is Bhutan converting its water to gold? What can be done about forest degradation in Nepal? How are the hill tribes in Bangladesh surviving? Read on to learn more.

Over the last years we have increased our emphasis on climate change. How then, we asked, can we reduce our

own contribution to global warming through workshops and other activities? An innovative solution was to have Prasad Kasibhatla, of Duke University, present a lecture on the global carbon cycle from Durham, North Carolina, while we listened in Bangkok, Thailand. Duke has new technology that makes this feasible. It is, completely interactive and costs very little – all we needed was a broadband internet connection, mikes, a computer and an overhead projector. We hope this is the wave of the future. We are also, of course, hoping to make a difference with good research on climate change. If you are interested in working on climate issues, please send us a proposal.

Finally, some news on our faculty and staff. SANDEE advisor Subhrendu Pattanayak has become an Associate Professor at Duke University and the SANDEE team has grown. Mani Nepal, who returned to Nepal recently from the University of New Mexico, has joined SANDEE, while Pranab Mukhopadhyay, who has been so instrumental to SANDEE's growth over the last years, has returned to his teaching responsibilities at Goa University. Pranab, will continue, to work part-time for SANDEE.

Enjoy this edition of the newsletter and we look forward to your comments as always.

- Priya, Rucha and everybody else at the SANDEE Secretariat

Research News

New SANDEE Grants

Economics of adopting Bt cotton: evidence from Pakistani Punjab

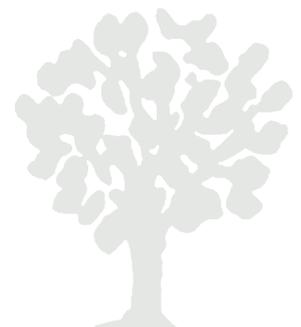
- Khuda Baksh

Khuda Baksh will analyze the economic performance of both Bt cottonseed and traditional cottonseed to determine possible reduction in pesticide use due to adoption of Bt cotton in the irrigated districts of Punjab, Pakistan. He will compare cost, yield and income of cotton growing farmers who use both Bt and traditional cotton. The study aims to understand farm level differences between new and traditional varieties and whether sowing Bt.cotton actually reduces the amount of pesticide typically used in cotton cultivation.

Social Cost Benefit Analysis of Informal Waste Sector: A Study of Delhi (conditional grant)

- Yamini Gupt

This study proposes to conduct an economic analysis of the recycling activities in the city of Delhi, India. Gupt will examine the various social, economic and environmental costs, benefits, and incentives associated with waste management. This is a conditional grant that is being further refined based on comments received.



Research Completed

This section presents abstracts from SANDEE's working paper series. Full papers are available online at www.sandeeonline.org



Storm Protection by Mangroves in Orissa: An Analysis of the 1999 Super Cyclone

Saudamini Das
SANDEE Working Paper 25

This study assesses how mangroves provide protection against storms. It uses data on human casualties, damages to houses and livestock losses suffered in the Kendrapada district of the Indian state of Orissa during the super cyclone of October 1999. The cyclone devastated 12 of the state's 30 districts causing 9,893 human casualties and 441,531 livestock deaths, and damaging 1,9 million houses and 1,8 million hectares of crop. The analysis incorporates meteorological, geo-physical and socio-economic factors to assess the impact of mangrove vegetation on cyclone damage. The results indicate that the presence of mangroves significantly reduced the number of human deaths and saved lives (both human and animal). Mangroves caused a significant reduction of damage to residential houses and to large animals like cattle and buffalo. The study finds that if the width of the mangrove forest was 10 per cent more than what it was at the time of the cyclone, human casualties would have been lower by 12.48 per cent, buffalo loss by 6.6 per cent, cattle loss by 2.23 per cent and fully collapsed houses by 2.21 per cent. Factors like land elevation, immovable asset holdings, etc., too, had decisive effects on human casualties in the storm surge affected areas.



Pesticide Use in Nepal: Understanding Health Costs from Short-term Exposure

Kishor Atreya
SANDEE Working Paper No. 28

Occupational health remains neglected as a subject in developing countries. Atreya focuses on acute health impacts associated with pesticide exposure in rural Nepal. Using data from 291 households, this study finds that the level of exposure to insecticides and fungicides can significantly influence the occurrence of health symptoms. One finding: the predicted probability of falling sick from pesticide related symptoms is 133 per cent higher among individuals who use pesticides compared with individuals in the same household who are not directly exposed. Households bear an annual health cost of NPR 287 (US\$4) as a result of pesticide exposure. These costs vary with exposure: an increase by 10 per cent in hours of exposure raises costs of treatment by about 24 per cent. Atreya finds that exposure to pesticides imposes a health burden of NPR 1,105,782 (US\$15,797) per year in the study area. Although pesticide use in Nepal is low relative to many other countries, this study, which is the first of its kind in Nepal, suggests that farmers and policy makers need to become aware of the health impacts of pesticide use as they continue to promote its use in Nepal.



Evaluating Gains from De-Eutrophication of the Dutch Canal in Sri Lanka: A Cost Benefit Analysis

W. R. Rohitha
SANDEE Working Paper No. 29

Sri Lanka's Dutch canal system is an important wetland area for shrimp farming and has become a promising foreign exchange earner. Rohitha finds however that with more than 1,300 farms working in an area of 3,750 hectares, shrimp farming in the Dutch Canal is largely unplanned and uncoordinated. The absence of controls has resulted in eutrophication of the lagoon system at a level high enough to cause a decline in the shrimp industry's output and also in the lagoon's fish harvest. A plan to rehabilitate the Dutch Canal to its original water quality status has been drawn up, with an estimated cost (in 1999) of LKR 180 million. This study estimates the increase in shrimp productivity that is likely to occur if the Canal is cleaned. The key finding is that the gains from reducing pollution in the Dutch Canal would far outweigh the cost of clean-up and the government could potentially recover the costs within two years.

Taxing Pollution: A Case for Reducing the Environmental Impacts of Rubber Production in Sri Lanka

Jagath Edirisinghe, Susantha Siriwardana, Sarath Siriwardana and Punsara Prasadith
SANDEE Working Paper No. 30



Most firms that process rubber in Sri Lanka do not comply with national water pollution control standards. This study estimates a pollution tax that can motivate firms to meet these standards. Using data from 62 rubber producing firms in Sri Lanka over three years, the authors estimate a marginal cost function for pollution abatement. They estimate the tax rate that can help bring firms into environmental compliance: 26 Sri Lankan rupees per 100 grams of Chemical Oxygen Demand (COD) per year. While the burden of a pollution tax on the average firm would be 8.6 per cent of annual turnover, the tax burden varies with the size of the firm. The authors suggest that the use of such an economic instrument may motivate the country's Central Environmental Authority to monitor effluents more stringently.

Call for Research Proposals — Economics of Climate Change

Human activity is altering the earth's climate with serious implications for food security, health, biodiversity and natural disasters. South Asian countries will need to respond with strategies to both mitigate green house gases and adapt to climate change. SANDEE would like to increase its support research on the economics of climate change.

We are soliciting concept notes on the following topics: a) Understanding the benefits, costs and distributional impacts of specific adaptation or mitigation strategies. b) Examining economy wide impacts of climate change policies through the use of macro-economic models. c) Analyzing incentives related to international climate mitigation/adaptation instruments and climate negotiations. d) Economic analyses of local and regional climate problems such as haze and black carbon and strategies to mitigate these. e) Increases in extreme events and the economic viability of 'adaptation instruments' such as insurance, increased natural barriers or institutional responses.

While we will collect proposals throughout the next 12 months, in order to be considered for our next research competition, we will need concept notes by **December 31st 2008**. Grant requests can range from 15 to 40,000 USD, but larger proposals need to include teams of natural and social scientists. If interested, please send in a 3 page concept note to application.sandee@gmail.com

Nepal's Community Forestry Funds: Do They Benefit the Poor?

Ridish K. Pokharel
SANDEE Working Paper No. 31

Funds generated through community forestry are important resources for rural communities in Nepal. Pokharel examines forestry funds in 100 communities in three districts to assess how large these funds are and how they are used. The study finds that the income from community funds increases local development resources by about 25 per cent. This income is invested in schools, temples, roads, and water reservoirs, which aids rural development. However, the 'pro-poor program' - an effort to reduce poverty through the resources generated from community forestry - continues to be hampered by problems. Pokharel's study finds that timber is subsidized and the subsidies accrue mainly to the non-poor. Furthermore, income spent on loans tends to favor the non-poor. Overall some 74 per cent of the benefits of community forestry funds accrue to the non-poor in rural communities in Nepal. Two courses of action are suggested by the study findings: a) permitting all households an equal share in timber that is harvested; and b) bringing more poor and less advantaged members into the executive committees which manage forestry funds.



Natural Resource Management in West Bengal – Informing Policy Makers

SANDEE and the Global Change Program, Centre for Rural and Cryogenic Technologies, jointly organized a policy discussion on natural resource management in West Bengal at Jadavpur University, Kolkata, on 13th June 2008. The occasion was used to present results from two SANDEE studies. Lekha Mukhopadhyay presented her work on the Buxa Tiger Reserve in North Bengal entitled 'An Institutional Quest about People's Low Participation in Biodiversity Conservation Program' and Indrila Guha and Santadas Ghosh's study, 'Can tourism be a vehicle for conservation? An investigation from the Mangrove Forests of the Indian Sundarban' was also discussed. The workshop was attended



Karl Maler & Jeff Vincent – Advisors in discussion

The Environment as a Production Input: A Tutorial

Jeffrey Vincent
SANDEE Working Paper No. 32

Most research on the value of changes in environmental quality focuses on direct impacts on individuals or households. Yet environmental quality can also affect welfare indirectly through its impacts on environmentally sensitive industries such as agriculture, forestry, and fisheries. In developing countries, whose economies tend to be more resource-based, production-related impacts are especially important. Vincent reviews the relationships among three key functions in production economics - production, cost and profit - and explains how these functions can be used to value changes in environmental quality. This paper is primarily conceptual, discusses implications for applied work and includes an empirical example that illustrates how production and profit functions can be used to value environmental inputs to rice production in India.

by more than 100 participants, including the Pro-Vice Chancellor of Jadavpur University, the Chairman of the Pollution Control Board, Secretary, Sundarban Affairs Department, Joint Director, Sundarban Biosphere Reserve, General Manager of VIVADA, a tour operator in the Sundarbans, Field Director of the Sundarban National Park, many academics and the press. The workshop resulted in a lively discussion on natural resources management, on park pricing and the capacity to manage tourism, which was disseminated in regional media outlets. The Sundarbans study is likely to form the basis for a broader research agenda being developed by the state.

Discounting Climate Change

Partha Dasgupta
SANDEE Working Paper No. 33

This paper discusses the idea of social discount rates as applied to public policy analysis. Dasgupta shows that those rates are neither ethical primitives nor observables as market rates of return on investment. Instead, they ought to be derived from economic forecasts and society's conception of distributive justice concerning the allocation of goods and services. The welfare theory is developed in the context of three empirical studies on the economics of global climate change. Dasgupta argues that the theoretical foundations of intergenerational welfare economics are still unsettled even in deterministic models. The paper shows that if the uncertainties associated with climate change and biodiversity losses are large, the usual formulation of intergenerational well-being could lead to ethical paradoxes. Various modeling avenues that offer a way out of the dilemma are discussed, and none of them is shown to be satisfactory.



Publications and Presentations

K. Atreya (2008), 'Health costs from short-term exposure to pesticides in Nepal', *Social Science and Medicine*, 67, 511-519

K. Atreya (2008), 'Probabilistic assessment of acute health symptoms related to pesticide use under intensified Nepalese agriculture', *International Journal of Environmental Health Research*, 18 (3): 187-208

M. Jahangir Alam Chowdhury (2008), 'Does Participation in Microcredit based Social Forestry Program Enhance Environmental Literacy? Experience from Proshika in Bangladesh', presented at the 23rd annual general meeting and conference (AGM) of the Pakistan Society of Development Economists (PSDE), 12th - 14th March, 2008

Krishna Prasad Pant (2008), 'Valuing Interventions to Reduce Indoor Air Pollution by addressing Endogeneity - Fuelwood Use, Deforestation and Health in Rural Nepal', presented at the 23rd annual general meeting and conference (AGM) of the Pakistan Society of Development Economists (PSDE), 12th - 14th March, 2008

Rucha Ghate presented the SANDEE book 'Promise, Trust and Evolution' at a Round Table organized by the Environmental Studies Program, University of Kansas, US, in August, 2008. The faculty and students participated in the discussion.

Das, Saudamini (2008). "Mangroves provide protection during cyclones: Evidence from the super cyclone for October 1999 in India. FEEM working paper/doctoral series 2.08, Italy. Saudamini's SANDEE research was among 3 chosen from 16 presentations made at a summer school in Venice.





SANDEE Participants at EAERE, 2008, Sweden

Strong SANDEE presence at the European Association for Environmental and Resource Economics (EAERE) Congress

- Saudamini Das

The 16th EAERE conference was held at Gothenburg University, Gothenburg, Sweden from 25 to 28 June, 2008. A pre-conference was organized on Environment and Development on June 25th with plenty of participation from researchers, practitioners and students from around the world. Priya Shyamsundar participated in a panel on 'the role of environmental economics for implementation of sustainable development'. The three-

day conference was structured around eight broad themes; each of which had 13-14 parallel sessions and every parallel session comprised 4-5 presentations. SANDEE was very well represented in the conference with more than 15 members of the SANDEE family including 10 grantees and several resource persons, who made presentations in different sessions. The grantees were Bhim Adhikari, Jahangir Alam Choudhary (Jac), Jahangir Alam, Jagath, K. P. Pant, Kavi Kumar, Lekha Mukhopadhyay, Min Malla, Saudamini Das and Vinish Kathuria. It was a great opportunity to learn about all the work that is going on in Europe and to be with friends. Many thanks to SANDEE advisor and current President of EAERE Thomas Sterner.

International Trading of Emission Rights and Its Implications for India - A Climate Change Workshop organized by the National Council for Economic Research, India and SANDEE.

Vijay Prakash Ojha presented the findings of his Working paper at a seminar at the NCAER on March 7, 2008. In a crowded conference room, Director, Suman Berry, welcomed the participants and members of the audience. Kanchan Chopra, Director, IEG, was the Chief Guest. E. Somanathan, Sanjib Pohit and Surya P. Sethi (Principal Advisor, Planning Commission) discussed the findings of the paper.

Ojha described his findings and placed the different options that were feasible for India. Somanathan and Pohit discussed technical issues and made suggestions on how the model could be improved. Sethi discussed energy options and the limits to carbon emissions for India. There was an involved discussion on the position that India should take at the Climate change negotiations and there were conflicting views on the matter. At the end, Pranab Mukhopadhyay, SANDEE, briefly described the work on Climate Change that SANDEE was initiating.

The audience had representatives from the academia, press, the Confederation of Indian Industries (CII), international organisations like Winrock & Oxfam as well representatives of the Norwegian Embassy. Please see media coverage at:

<http://economictimes.indiatimes.com/articleshow/msid-2863777,flstry-1.cms>

Emerging Challenges and ICIMOD's Role in the Hindu Kush-Himalaya Region

-Andreas Schild
Director General ICIMOD
aschild@icimod.org

Emerging Challenges

The Hindu Kush Himalaya (HKH) region extends across a stretch of some 3,500 km running through eight countries: Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan. The total area covered by the HKH region is about 3,566,473 square kilometers, of which about 37 per cent consists of pastures, 24 per cent forests, 3 per cent protected areas, 5 per cent agriculture and 30 per cent other land uses. The world's mountain peaks above 8,000 meters, the deepest gorge and the deepest valley all lie in the HKH region.

Over the last several decades the 210.53 million people that live in this vast landscape are experiencing enormous changes due to global warming, globalization and population growth and migration. Mountain people are finding it difficult to cope with the variety and scale of emerging changes. As is so often the case, it is the poor, women, children and other vulnerable groups who bear a disproportionate impact of these changes.

The HKH region has the third largest concentration of snow and ice after the two polar regions. Also known as the water tower of Asia, the region regulates the flow of nine major river systems and provides varied water related services to about two billion people downstream. As population grows and the pace of development accelerates in the region, water demand is also increasing. Water, at different times of the year, is also a hazard in the form of floods, which lead to loss of lives and property, as was seen this year in Bihar, India. These problems are expected to worsen as glaciers melt faster and precipitation (snow and water) becomes more erratic due to climate change.

This region contains a unique array of flora and fauna of global importance, including four of the world's 34 biodiversity hotspots. But these natural ecosystems in the region are undergoing dramatic changes. For the most part, ecosystem services have degraded and this in turn is deepening poverty among many people who depend on natural resources for their livelihoods. Globalization and climate change are already affecting biodiversity in ways that are still being understood.

What is certain is that this unique asset needs to be better managed to improve the livelihoods for the present and future generations of mountains dwellers and for those in the plains who depend on water from the HKH for their survival.

The HKH is becoming relatively more accessible with globalization having brought new benefits and opportunities even in remote parts of the region. At the same time, the same forces have also disrupted traditional farming and cottage industry practices, traditional livelihoods and coping mechanisms of many mountain communities. Migration is one such important coping mechanism which channels remittance income to the mountain areas. However, it has also increased drudgery, workload, and responsibilities of the mountain women and marginalised minorities in many places. Generating options for sustainable livelihoods to reduce poverty is the most effective way to adapt to the emerging challenges that confront the HKH region.

ICIMOD's Role

The problems and challenges confronting the HKH region are formidable, but the region has enormous potentials of development given its huge resource base. Despite the vastness and diversity of the HKH, common characteristics link the countries it bestrides. While the region lacks a tradition of regional cooperation, the impacts of globalization, climate change and population dynamics are trans-boundary matters. This is where ICIMOD can:

- Play a catalytic role to integrate mountain specificities into an agenda of mountain development of the member countries.
- Provide an enabling environment for member countries to come together with representative scientific information necessary for developing a comprehensive understanding of the region.
- Serve as a regional hub and facilitate trans-boundary dialogue and thus become a regional knowledge hub for sharing knowledge generated in the region and beyond. ICIMOD can facilitate the transfer of good practices around the HKH.

The challenge for ICIMOD is to bring together policy makers, scientists and scholars, people from civil society and from academia to share experiences and find solutions.

¹ These river basins are Indus, Ganga, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze, Yellow and Tarim

Discussion

Jhum Farming in the Hills of Bangladesh Case

- M A Monayem Miah
Senior Scientific Officer, BARI, Bangladesh
monayem04@yahoo.co.in

About a tenth of Bangladesh is hilly. The country's hill regions are rich in natural resources including timber, several species of bamboo, medicinal plants, and a variety of other flora. Besides rice, sugarcane, maize, and tuber crops, fruits and vegetables are also grown. More than half the inhabitants of the hill region belong to ethnic communities (12 tribes) while the rest are Bengali migrants from the plains. The hill people are, in general, very poor and illiterate, and their livelihoods depend on wage earnings and *jhum* (slash and burn) cultivation. Collection of timber, firewood, and house-construction material remain important sources of income for hill people. Livestock and poultry provide additional income. *Jhum* continues to be practiced because of both historical and poverty-related reasons.

Land ownership is a complex issue in the hill areas. Over time an increasing proportion of land is privately owned, creating private property rights over land. Due to demographic pressure and a relative shortage of land, land under *jhum* has shrunk. *Jhum* cultivation is characterized by cultivation of upland rice and other mixed crops, and has been the dominant cultivation system of most tribal people in the hills. The dry vegetation is burnt and the hill is cleaned for sowing seeds of major *jhum* crops – vegetables, rice and some cash crops.

Jhum cultivation is becoming increasingly unsustainable because of a contracting fallow period between cultivation cycles. In the past, *jhum* was practiced with a fallow period of 15-20 years which ensured the long-term sustainability of soil fertility. However, due to rapid growth in local population and commercialization of agriculture, this cycle has been abbreviated to between three and four years. The effects are manifold: regeneration of secondary forest is retarded, soil erodes more quickly and biodiversity decreases.

Empirical evidence shows that the annual loss of topsoil ranges from 39.70 to 45.00 ton/ha. Erosion at this rate causes a loss of water-holding capacity, of nutrients needed for crop production and affects crop productivity. *Jhum* cultivation relies largely on own inputs and the natural fertility of the soil. About 80 per cent of the total cost of production was



domestically supplied in which 75 per cent of the labor and all the seed was from family sources.

Viable alternatives such as agro-forestry and plantation are being practiced on a very limited scale in some hill areas. Several agro-forestry production techniques, designed with locally adapted trees and crops for different slope conditions, are found to optimize the production of agro-forestry crops and minimize environmental degradation in the hill areas. One promising technique is the multi-strata fruit orchard, promoted by Bangladesh Agricultural Research Institute. Evidence shows that the method checks up to 77 per cent of topsoil loss and that *jhum* farmers would receive up to 190 per cent higher return if they adopted the technique. The high initial cost of establishment, longer gestation period, and unclear customary rights are deterrents to the adoption of such farming in Bangladesh, problems that can be overcome with financial support and technical assistance.

Fragile Mountain Ecosystems: The Socio-economic Spine of Bhutan

- Sonam Choiden
Lecturer, Sherubtse College
choidensonam@yahoo.co.in

Bhutan has kept its natural ecosystem intact, perhaps more than any other country in Asia. With a population of about 630,000, development in Bhutan is guided by the national vision of Gross National Happiness aimed at balancing its economic development with the protection of environment and culture.

The country is heavily dependent on its mountain ecosystem for agricultural production and hydropower. Almost 75 per cent of its population

depends on subsistence agriculture and forestry resources for livelihoods. These sectors contribute the most to Bhutan's GDP, but their share has declined to 22.5 per cent in 2006 from 36 per cent in 2001. The ecosystem, although fragile, has well-conserved watersheds and multi-layered forests.

Bhutan has the highest proportion of forest cover in Asia of 72.5 per cent, and protected areas cover over 26 per cent of the country. Such a high proportion is not without its own problem, for the policy of increasing forest cover is being implemented at the expense of agricultural land. Due to its extensive forest cover Bhutan has net sequestration of greenhouse gas and carbon trading may generate revenues. These forests are rich in non-timber forest products that are collected by rural populations for whom they provide an alternate source of livelihoods: lemon grass oil, lichen species, mushrooms and medicinal herbs are high-value products.

Water is an abundant resource. Fed by numerous glacial lakes Bhutan has four major river systems. Their importance for hydropower is seen by the power sector's contribution to GDP (14 per cent in 2007 and growing) with revenue from electricity sales amounting to 48 per cent of the country's total exports. Part of our future plan is to grow economically by providing electricity to our giant neighbors India and China.

Our biggest challenge ahead is in understanding the trade-offs between good stewardship and economic well-being. Some of the resource decisions we make over the next decade will have far reaching consequences for our culture and economic growth.

From Glaciers to Humans: Combating Climate Change in the Sikkim Himalayas

- Sandeep Tambe

Joint Secretary, Rural Management and Development
Department
Government of Sikkim, India
sandeep_tambe@yahoo.com

The Himalayan region is a global biodiversity hotspot and home to 10,000 species of vascular plants, 300 mammal species, 979 bird species, 177 species of reptiles, 124 species of amphibians and 269 species of fishes. These mountain ranges are also a source of freshwater, firewood, fodder, timber, non-timber forest produce and other bio-resources all of which sustain livelihoods. Biotic interference and climate change have recently emerged as major causes of degradation in the region. A number of studies on climate change have been conducted which

highlight the rapid rate of decline of the glaciers, rise in temperatures and altered weather patterns.

The Himalaya is also a source of freshwater, firewood, fodder, timber, NTFP and other bio-resources and the associated traditional knowledge, which sustains livelihoods. Biotic interference and climate change have recently emerged as the major causes of degradation in the region. Various research institutions have conducted studies on climate change which highlight the rapid rate of decline of the glaciers, potential hazard posed by GLOFs, rise in temperatures, weather patterns, impacts on vegetation communities and other indicators of climate change. Over the years a lot of valuable information has been generated on the impacts of climate change on glaciers, vegetation etc, about which unfortunately not much can be done at the local level to change the trend. The gap in the information is in areas related with mitigation and adaptation methods at the local level. Emerging questions of today are - what are the impacts of climate change on mountain springs which ensure water security in the mountain villages, on sustainability of mountain niche crops which are the major cash earners, on vulnerability of geographic poverty hotspots, on health issues related to vector borne diseases and so on.

In this regard some activities at the local level that need to be taken up urgently are:

- Identifying varieties or cultivars of mountain niche cash crops like apple, orange, large cardamom and other indigenous crops and their associated best practices which can make them resilient to climate change
- Prioritize spring water conservation
- Constitution of a hydel power developers consortium for GLOF monitoring



- Promotion of rain water harvesting
- Providing capital subsidy on solar water heaters to reduce firewood use
- Include climate change in school curriculum
- Sensitize policy makers for mainstreaming climate change sensitivity in ongoing government programs, and
- Preventive care for vector borne diseases.

The Himalayas are changing fast; it is time to shift the focus back on humans.

Deteriorating Mountains in Nepal

- Bishnu Prasad Sharma
Lecturer, Patan Multiple Campus, Nepal
bisunita@wlink.com.np

Nepal consists of layers of elevated terrain: low hills, the midlands, the Himalayas and the inner Himalayas. The mountains and the high lands (above 3,000 meters) are a resource supplier to numerous natural ecosystems downstream. The mountains and the hills alone cover 86 per cent of the total land area of Nepal. The mountain region is home to 7.3 per cent of Nepal's population, with about only 4 per cent of its land area under cultivation. Low average temperatures permit only a single crop to be harvested in small quantities and most of the region (13 of the 16 mountain districts) is severely food deficient.

People secure their livelihoods by raising livestock for fiber, milk, meat, manure and draft power. Some seasonal income accrues from the tourism industry through work as mountaineers and porters to foreign trekkers and expedition teams. Collection of high altitude medicinal herbs, particularly in the western mountains, is another alternative. Even so, migration from the hill districts has been steady: the population in the mountains was 9.9 per cent of the total in 1971, and has fallen to 7.3 per cent in 2001.

Forest, agriculture and livestock constitute the combined basis of traditional mountain livelihood. The average temperature increase in the region, and the expected rise to between 3.5 and 5.5 degree Celsius by 2100 in the sub-continent makes forests particularly vulnerable. Due to the absence of alternatives, regenerating forests in the mountains are threatened by growing demand for firewood and timber both locally and across the border in Tibet. Community forestry and leasehold forestry are new policy initiatives for the protection of forests and to improve livelihoods in the mountains and hills of Nepal. Community forests are forests managed by the communities as users, while leasehold forestry is a program that provides land on a 40-year-lease to



Flying to view Nepal's Mountains– SANDEE Group, 2008

targeted poor and the landless households endowing them with full extraction right. These programs have been successful in the hills, but in the mountain regions they are constrained by climatic factors that restrict plant growth, while the problem of physical access imposes higher implementation costs. These are challenges that we need to recognize and find solutions for as we respond to climate change.

Economic Prescriptions for Mountain Ecosystems in Pakistan

- Ali Dehlavi and Meherunissa Hamid
Program Economist and Program Management Officer
WWF-Pakistan's Indus For All Program
adehlavi@wwf.org.pk

Among the 72 million inhabitants of Pakistan's northern mountain ecosystem are some of Pakistan's poorest farm households, living in river valleys where irrigation is fed by glacier melt and snow melt. These households may already be receiving snowmelt earlier than usual each year, making water availability less synchronized with the summer growing seasons. Downstream, the Indus Irrigation Scheme depends on about 50 per cent of its runoff originating from snowmelt and glacial melt from the (eastern) Hindu Kush, Karakorum and Himalayan ranges: it forms the world's largest contiguous irrigation system, the Indus basin, which is home to over 100 million people, two million farms, and the Punjab province which alone produces 90 per cent of Pakistan's food.

Pakistan must quickly address an alarming resource degradation trend in the northern mountain ranges: rising Himalayan temperatures (exceeding the global average of 0.74 °C in the past 100 years) are causing permafrost and glaciers to retreat, with most precipitation falling as rain, causing earlier snowmelts and shorter winters which in turn affect

river regimes. Snow avalanches and glacial lake outburst floods are expected at high elevations (above 3,500 meters). Lives and properties of middle mountain communities (500-3,500 meters) are expected to be endangered by landslides, debris flows, and landslide dam outburst floods. In the Indus lower valleys and plains, annual discharge possibly in all five major tributaries of the Indus basin (Sutlej, Beas, Ravi, Chenab, Jhelum) would increase, and, as peak flows rise, glacio-fluvial sediments are likely to damage dams, barrages and watercourses. In the long run, a decrease in dry season discharge is expected, thereby limiting communities' access to water supply.

In response to this threat to Pakistan's northern mountain ecosystem, scientists' help is needed to develop missing or absent baseline socioeconomic and ecological data, Environmental and resource economists need to question the short term nature of decision-making in the Indus basin and concentrate their research on tangible economic results for the long term.

Eco News



Researchers Rafiq & Joga – enjoying the moment, Kathmandu

Bhutan

The environment-friendly policies of Bhutan have encouraged the country to participate in global carbon trade. The Agriculture Ministry is considering earning carbon credits under the provisions of the Kyoto Protocol on the basis of the country's more than 70 per cent forest cover, large natural reserves and hydro projects. Since the Kyoto Protocol does not recognize standing forest or country's efforts to protect them, Bhutan plans to undertake plantation on 8 per cent of its degraded forests and shrub areas.

Sri Lanka

The Sri Lankan government has imposed an Environmental Conservation Tax on the communication and transportation sectors. The Telecommunication Regulatory Commission is to be responsible for collection of these taxes. An annual tax of LKR 50,000 will be levied on institutions owning television and broadcasting transmission towers. An environmental conservation tax has been imposed on CFL bulbs, and on motor vehicle revenue licenses depending on the weight of the vehicle and the type of fuel used. The Central Environment Authority introduced the levy under the Environmental Conservation Tax Act 2008, on the polluter pays principle in keeping with the Rio Protocol of the first Earth Summit (1992) to which Sri Lanka is a signatory. The funds collected through the Environmental Conservation Tax are to be used for collecting, recycling and safe disposal of mobile phones.

- Contributed by Manoj Thibbotuwawa.

India

The Cabinet Committee on Economic Affairs has approved the Water Resources Ministry's plan to create a data bank to coordinate and process information regarding water resources. The scheme called 'Development of Water Resources Information System' is being implemented during the Eleventh Five Year Plan (2007-12) at a cost of INR 2,343 million.

Nepal

A rapid food security assessment mission has been put in place to help government deal with the situation of severe food insecurity in several districts of Nepal. Over 250,000 people in nine districts in Nepal's mid- and far western regions are facing a precarious food security situation due to crop failure. This is even while the country reports an increase in agriculture production: 16.8 per cent for paddy, 3.8 per cent for wheat and 3.2 per cent for maize. According to the Ministry of Agriculture, Nepal faces a serious risk of stagflation – a condition of low economic growth, high employment and rising prices.



Participants environmental economic course, Bangkok

SAANDEE Activities

Three plenary talks at the 16th Biannual Research and Training Workshop July 2008, AIT, Thailand

SANDEE organized its first interactive distance learning seminar given by Dr. Prasad Kasibhatla, Associate Professor of Environmental Chemistry, and Associate Dean for International Programs, Nicholas School, Duke University. Dr. Kasibhatla delivered a presentation on "The Global Carbon Cycle" to 35 workshop participants. From an atmospheric chemist's viewpoint, Dr. Kasibhatla focused his talk on the policy need to understand and quantify the anthropogenic carbon dioxide (CO₂) budget in order to predict future climate change. Key messages from the presentation were:

1. While it is clear that the rate of change and absolute concentrations of CO₂ are unprecedented in the recent past, controlling mechanisms for large natural variations in atmospheric CO₂ are not understood.
2. The carbon budget's decadal timescale input/output accounting must reduce uncertainties in landuse change flux - of the order of 0.5-2.7 million tonnes of carbon a year - through mapping the extent and spatial distribution of tropical deforestation. A solid mechanistic understanding of terrestrial sinks is essential for estimating future climate change paths.
3. Although reducing deforestation is a step towards stabilizing atmospheric CO₂, concentrations through 2100, it was argued that achieving stabilization near 450 ppm in 2050 must be principally shouldered by fossil fuel emission reductions.

- Ali Dehlavi

Dr Andreas Schild, Director General of ICIMOD delivered a plenary talk on the challenges facing Hindu Kush Himalayan Management and the role of ICIMOD. He highlighted the importance of the mountain ranges, which spread from Afghanistan to Bhutan. These mountain ranges are sanctuaries for various flora and fauna. He illustrated how these ranges are sources of various important rivers in the region such as the Indus. Consequently, their significance as a provider of water for the very survival of the people is critical. He pointed out that climate science studies measure the extent of forest cover of North America and Europe, which are strategic assets for the global climate. However, the roles of the forest of Himalayan ranges are not considered because of the non-availability of data. Dr Schild suggested a partnership with SANDEE to conduct joint studies for a better understanding in this area.

- Rafiq Muhammad



Laughter with Kavita , Ratna & Prakash

Dr. Herath Gunatilake, Senior Economist, Economics Research Department, Asian Development Bank, gave a talk on 'Privatization Revisited: Lessons from Private Sector Participation in Water Supply & Sanitation (WSS) in Developing Countries'. He said that the role of the public sector in a market economy includes framing regulations for creating and maintaining an enabling environment for the markets to function, correcting market failures, and ensuring the equitable distribution of economic outcomes. Based on his study, Dr. Gunatilake said that piped water has many characteristics of a private good. Nevertheless, privatization has failed mostly in developing countries as this was often carried out without the support of sufficient planning, analytical work and public consultation. The success of privatization largely depends on supply side norms like an enabling environment, innovative schemes for product market competition, effective regulatory mechanism and enforcement. It also requires strong institutional factors and demand side norms like adequate willingness to pay for improved WSS services, feasibility of metering, cost recovery tariffs and context-specific measures. Selective private sector participation in the water sector is necessary given the fact that changing ownership structure alone doesn't necessarily enhance the water supply efficiency. Moreover, a reasonably well functioning public sector is a precondition for the success of the private provision.

- Manoj Thibbotwawa

Program Evaluation for Environment and Resource Economists

4th July, 2008
AIT CC, Pathumthani, Thailand

Evaluation of programs, either before they are designed or after they are implemented, are increasingly viewed as critical for learning and improving accountability of public policies. Many argue for an expanded role for rigorous impact

evaluation of development projects, programs, and policies and the development community increasingly recognizes the need for evidence of effectiveness. Unfortunately, resource and environmental economists have little or no training or guidance on how to conduct such evaluations using sound and rigorous empirical methods. While there are many texts explaining the how and why of impact evaluations, these ideas have not been mapped into the 'environment and development' context and terminology. This day long course served as an introduction and a refresher for evaluation of programs, projects and policies in the environment and development arena. Participants included some 25 SANDEE researchers and the course was taught by SANDEE Advisor, Dr. Subhrendu Pattanayak.

A Training Course in Environmental and Natural Resource Economics

AIT CC, Pathumthani, Thailand
5th - 23rd May, 2008

SANDEE organized a three-week training course in Environmental and Natural Resource Economics for Economists from 5-23 May, 2008. The course was meant for practicing South Asian economists interested in upgrading their skills and learning related to Environmental and Natural Resource Economics. The workshop provided economists with the basic skills necessary to teach environmental

and natural resource economics and to undertake research in this area. The course covered economic issues underlying sustainable development, poverty-environment interactions, and natural resource use and pollution management. Participants were exposed to basic theoretical issues and economic tools and methodologies for analyzing environmental problems in developing countries.

Other News

Vacancy

Fellowship in Environmental Economics CORE, Université catholique de Louvain (Belgium)

The Center for Operations Research and Econometrics of the Université catholique de Louvain is offering one research fellowship in environmental economics starting September 1, 2009. The position is for one or preferably two years at the assistant professor level and is open to candidates with a PhD degree. Applications (personal data, CV, degrees, current position, research interests with sample papers and name of three referees) must be filled through the website <http://pdc.core.ucl.ac.be/FELLOWS/index.php>, before November 30.



Research and Writing Workshop at Kathmandu, September 13-17, 2008

From past experience I am sympathetic to the unenviable position of a young researcher defending a research proposal in front of SANDEE's full R&T audience. Just before the presentation one is confident, knowing the content well and feeling assured about the quality, having put in so much hard work. Being invited to R&T is enough to feel privileged! But once the presentation is over and experts begin their discussion, pointing out the gaps in the proposal, one often wishes the

invitation had not come at all!!! This Pre-R&T Workshop concept - another example of SANDEE's dynamic and evolutionary ways - delivered a great service to prospective researchers. A small gathering with 12 presenters and four experts turned out to be so effective that all the presenters substantially changed their content and research questions after the first day of presentation. It was hard work for all of us for four days, but the idyllic setting of the mountain resort at Nagarkot near Kathmandu, and the view of snow-clad peaks relieved our pressure to a great extent.

- Santadas Ghosh

Congratulations

Janaranjan Herath has joined West Virginia University, Morgantown, USA, for doctoral studies on Natural Resource Economics (NRE) with a scholarship. He started his work from September 2008.

Krishna Pant's proposal, "Developing Market for Carbon Sequestration in Agriculture", was among the 100 finalists of the Global Development Market Place 2008 of the World Bank. He was invited to Washington to share his innovative ideas.

Indrila Guha has been selected as a climate change leader by the Climate Change Leadership Program of LEAD India. She is one of the 30 candidates selected in the Western and Eastern Himalayan regions to tell the world of their endeavors in facing the challenges of climate change.

INSEE recently declared its executive committee of 10 members. All the members were elected unopposed. Including the President, five members have direct a SANDEE connection. While Purnamita Dasgupta, Seema Purshottaman and Amita Shah are former SANDEE grantees, Pranab Mukhopadhyay was SANDEE's Environmental Economist for the past two years. Sudarshan Iyengar, President of INSEE, has worked as advisor.



Priya, Anu, Bharati – Nagarkot workshop, September 2008

MEMBERSHIP FORM



General Information

Name of the Institution:
Name of Contact Person:
Designation:

Brief description of objectives & activities of your organization (Max. 10 sentences)

Payment Details (Enclose Cheque/Draft)

Cheque no.....
Amount (in US\$).....

Notes: This form is for institutional members only. The institutional membership fee is US\$50 per year for South Asian institutions and US\$250 per year for non-South Asian institutions.

Information about SANDEE and our activities are available online at www.sandeeonline.org. Our mailing address is IUCN Nepal, PO Box 8975 EPC-1056 Kathmandu, Nepal. Telephone: 977-1-552 8761; Fax 977-1-553 6786. If you have any questions about our program, please write to Anuradha Kafle at anuradhak@sandeeonline.org

Mailing Address

Street:
City:
State/Province/Zone:
Country:
Postal Code/Zip/PIN:
Telephone:
Fax:
Mobile:
Email Address:
Home Page/Web site:

Drawn on (Name of Bank).....
Membership Fee for the Year.....



SANDEE Secretariat Staff, September 2008

Events

Banking on Mangroves: A Case for Investing in Coastal Ecosystems
Karachi, Pakistan
27th – 29th Nov. 2008

17th Biannual Research and Training Workshop
Kathmandu, Nepal
9th Dec - 13th Dec, 2008

A Training workshop on the Economics of Eco-system Services
Thailand
March, 2009

A Training Course in Environmental and Natural Resource Economics
AIT CC, Pathumthani, Thailand
5th - 23rd May, 2009



Our mailing address:

SANDEE, c/o IUCN Nepal
P.O. Box: 8975 EPC-1056
Kathmandu, Nepal
Telephone: 977-1-552 8761
Fax: 977-1-553 6786
E-mail: info@sandeeonline.org Information
about SANDEE and our activities can be
obtained online at www.sandeeonline.org

