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**Dear Friends and Colleagues,**

In the spirit of experimentation and devolution, SANDEE invited Rucha Ghate, of SHODH, Nagpur, to guest edit this issue of the Newsletter. We hope our readers welcome this adventure!!

We are honored in this edition to have a contribution from Prof. Kenneth Arrow under 'Focus.' He summarizes for us a speech he made in Dhaka at a public program organized by SANDEE and the Bangladesh Economic Association. In addition, this issue includes a new feature: 'Across South Asia.' The first article for this column comes from Amita Shah, who discusses transborder environmental concerns that need deeper research. We describe the Pakistan Institute for Development Economics under 'Profile.'

After three years of its inception, SANDEE invited two distinguished development thinkers – A. Vaidyanathan of the Madras Institute of Development Studies and Stein Hansen of Nordic Consulting Group AS to evaluate its activities. Over the last few months, the evaluators reviewed material and met with grantees, applicants, advisers, program managers and resource persons. The evaluation report has just been finalized and we feel extremely encouraged by the evaluators' positive observations and recommendations. Presenting their overall assessment, the evaluators state "*SANDEE fills a real gap in training and research on economic aspects of environment and the complex linkages between environment, poverty and well being in South Asia*". Recognizing the challenges of operating a regional program in South Asia, the report says, "*SANDEE has proven that it is indeed possible to establish and sustain an operational regional network focused on these issues in this tense region, and as such foster cooperation between these countries around their common development challenges*". The evaluators have recorded their conviction that SANDEE activities should be continued, consolidated and expanded so that it can provide inputs into poverty reduction strategies of SANDEE member countries.

We present the major recommendations made in the evaluation report at the end of this newsletter.

Be well and take care,  
Rucha, Priya and all of us at the SANDEE Secretariat

**SANDEE...**

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



SANDEE's 6th Research and Training Workshop held in Colombo, Sri Lanka

## RESEARCH NEWS

SANDEE recently made several research grants to researchers from South Asia. A brief description of these grants is presented below. This information may be particularly useful to new applicants seeking to obtain SANDEE research funding.

### SANDEE's Fifth set of Research Grants, June 2003

*Common Property Resources (CPRs) as Drivers of Development: A study of Non-Timber Forest Products (NTFPs) in Himachal Pradesh, India:* Purnamita Dasgupta, Delhi, India

So far CPRs have been viewed as mere livelihood providers. This study seeks to map the role of CPRs as a source of sustainable rural income in the context of opportunities created by economic development (such as improved access to markets). The income generating potential of CPRs will be studied in terms of two NTFPs, namely medicinal plants and fruits collected by rural households. This research will focus on two sites in Himachal Pradesh.

*Development of an Appropriate Financial Support System for Soil Conservation in Tea lands in Sri Lanka:* J.A.A.M. Jayakody, Tea Research Institute, Talawakelle, Sri Lanka

The productivity of tea gardens located on higher elevations is less than low-lying ones due to land degradation. The

researcher seeks to identify incentives that will encourage tea growers to implement soil conservation and rehabilitation practices. An emerging understanding within the tea industry that sustainable practices can also be profitable drives this research.

*Valuation of Urban Air Pollution: A Study of Kanpur Nagar, Uttar Pradesh:* Usha Gupta, Bhimrao Ambedkar College, New Delhi, India.

This study seeks to quantify, in monetary terms, the benefits of improved air quality. Usha Gupta will estimate the costs of health damages caused by air pollution as part of her Ph.D. dissertation. The motive is to provide inputs for designing appropriate environmental policies and initiate corrective measures. The site for the study is Kanpur city in Uttar Pradesh, India.

*Pesticide use in Rice Production and Human Health - A Study in Kerala:* P. Indira Devi, Kerala Agriculture University, Thrissur, India

This study aims to analyze the pesticide-based economy of the state of Kerala, and focuses on human health effects as an externality. Dr. Indira will estimate the impact of pesticide exposure on different users of pesticides and calculate the costs incurred. The overall goal of the research is to evaluate the rationale for current investments in pesticides in rice production. This study has been conditionally approved and is under final revision.

## FOCUS ...

We were honored by the presence of Nobel laureate Prof. Kenneth Arrow at a SANDEE research and training workshop in Dhaka, Bangladesh. Prof. Arrow summarizes below parts of the public lecture he gave at a meeting organized by the Bangladesh Economic Association and SANDEE.

### SOME PARADOXES OF SUSTAINABILITY: EMPIRICAL AND THEORETICAL

Kenneth J. Arrow

First, let me state a few qualifications. (1) This note draws on many references and is by no means original. (2) It ignores some basic problems, particularly population growth, risk and uncertainty, and externalities. (3) It raises more questions than it answers.

### THEORETICAL PARADOX

There are conflicting intuitions on the future prospects of humanity, especially as they are influenced by natural resource limitations. One view is that everything is running out of everything. The world is going to starve. Oil and other minerals are being rapidly exhausted. The capacity of the atmosphere to absorb CO<sub>2</sub> and other greenhouse gases is limited. The Gulf Stream may cease to flow. Water supplies in many parts of the world are judged in critical supply. Rangelands are being exhausted. (All of these remarks, except the first, have serious studies behind them.)

The opposite view is also held. The condition of human beings has never been better. *Per capita* gross domestic product (GDP) is growing everywhere, except in sub-Saharan Africa and some South Asian countries. Longevity in even very poor countries is greater than what it was a century ago in most advanced countries. Prices of resources are not increasing, and known reserves of minerals are increasing. Anyway, knowledge is growing and will solve the problems that we do have.

Underlying this conflict is an ethical question: what does the present owe the future? By our present consumption, we reduce the availability of resources to meet the needs of future generations. In order to think properly about this issue, we have to recognize that needs may be satisfied in different ways and that these different modes of production in turn can be based on different kinds of capital stocks. Under the heading, "capital," it is, of course, very important to include not only the manufactured goods (plant and equipment) used in production but also natural capital, such as minerals, top-soil, water, and water and air as places for disposal of wastes,

### Publications and Presentations by SANDEE Researchers

Amita Shah, 2002, "Uneven Development and Migration: Insights from Micro Initiatives" in Ghanshyam Shah, Mario Rutten and Hein Steefkerk (eds.), Development and Deprivation in Gujarat (in Honour of Jan Breman), Sage Publications, New Delhi.

Bhim Adhikari, Salvatore Di Falco and Jon C. Lovett, 2003, "Household Characteristics and Forest Dependency: Evidence from Common Property Forest Management in Nepal", resubmitted to Ecological Economics.

Deepshikha Mehra & Rucha Ghate 2003, "Community Initiated Forest Management: How Feeble, How Strong? A Study of Three Villages from Central India", presented at RCSD International Conference held in Chiang Mai, Thailand, July 11<sup>th</sup>-14<sup>th</sup>.

Pranab Mukhopadhyay, 2002, "Now that your land is mine... Does it Matter?", presented at ICTP, Trieste, Italy.

\_\_\_\_\_, 2003, "Revisiting Demsetz: Institutional Change & Community Resource Ownership in Western India", presented at 'Conversations between Economists and Anthropologists', University of Berkeley, California between August 1<sup>st</sup> and 3<sup>rd</sup>.

Vinish Kathuria, 2003, "Failure of Collective Action as an Institution: Lessons from Kundli, Haryana", Institute of Economic Growth, Working Paper, E/230/2003, February, Delhi

\_\_\_\_\_, 2003, "Does Informal Regulation of Pollution Work? Empirical evidence from India", presented in 13th EAERE Conference held in Bilbao, Spain, June 28-30.

\_\_\_\_\_, 2003 "Pollution Control by SSIs - Lessons from failure of Collective Action in India", poster presentation in the 13th EAERE Conference held in Bilbao, Spain, June 28-30.



Along with serious hard work.....there is great fun too! SANDEE participants sightseeing in Kandy, Sri Lanka

and the growth of knowledge. Therefore, the capacity to produce depends on the vector of these capital stocks.

How should we balance capital building (investment) against current consumption? One point of view is that we should maximize the total stream of utilities from consumption now and in the future. But then the question is, whether the future utilities should be discounted. If we discount, we are in effect saying that the distant future will get very little weight. If we do not discount, then the preferred savings rate becomes so high (60-70% under plausible assumptions) as to be incredible as a basis for action. This is the theoretical paradox.

A rough and seemingly-satisfactory guide is to ask that net investment be positive; then the next generation has at least as much opportunity as the current. To perform this test we have to take investment and disinvestment in the different kinds of capital (manufactured, natural, and knowledge) and weigh them by their (marginal) contributions to long-term welfare. The aggregate, including changes in all forms of capital, has been called, "genuine investment." The formula is clear in theory, though empirical implementation may be difficult.

## EMPIRICAL PARADOXES

One empirical test (due to Kirk Hamilton and colleagues at the World Bank) is to compute genuine investment, with many approximations. The figures show strongly that richer countries tend to have positive genuine investment while poorer ones (and those highly dependent on mineral resources) show negative genuine investment.

Another test is to observe whether natural resources are in fact being depleted. Predictions of depletion go back at least to W. S. Jevons in 1865; he found that the best seams of coal in England had been exhausted and that therefore it was faced with rising coal costs (and consequent loss of comparative advantage in manufacturing). Harold Hotelling in 1931 developed a general model, which showed that the price of nonrenewable resources (net of extraction costs) should rise at a rate equal to the rate of return on capital. Even if extraction costs fall because of technological progress, the exponential growth of the net price should be dominant after some period of time.

What are the facts? The flow of minerals through the United States economy increased sixty-fold from 1900 to 2000; price index fell by 40 percent (though there were wide fluctuations on the way). The known reserves of virtually all minerals have steadily risen between 1950 and 1990, from doubling to 7 or 8-fold (only for tin has there been a decline). Some geologists believe that reserves deeper in the Earth's crust

are very large and will be available, though at higher costs.

One has to infer that the exhaustion of conventional minerals is not imminent and probably can be further postponed by letting the price system work more effectively (for example, by ceasing to subsidize electric power and water). It is clear that the more immediate dangers are those associated with climate change and with atmospheric and water pollution.

## ACROSS SOUTH ASIA...

*This is a new column that we are hoping to continue. In this introductory piece, Amita asks if we South Asians can have a shared vision for the region? She argues that this will lead to mutually beneficial environmental solutions, but there is hard work ahead.*

### Development and Environment: Towards a South Asian Perspective

- Amita Shah

Gujarat Institute of Development Research, India

South Asia (SA), home to significant bio-diversity, is characterized by high population density, complex geo-political realities, and also substantial economic potential. Realizing the region's economic promise, however, appears to involve significant threats to environmental sustainability. These threats emanate from demographic pressures on the one hand and weak governance on the other. As a result, SA is unable to capitalize on the strategic geo-political advantage it possesses, linking the Far East and the Central-western parts of the world. One way to meet its challenges and reach its full potential is to share experiences and cooperate in the pursuit of sustainable development. This is desirable because each major country within the region has certain specific strengths (and also weaknesses) with respect to key sectors and resources.

SA has 23 per cent of the world's population and 43 percent of the world's poor. Despite its rich bio-diversity, the per capita availability of natural resources such as land, water, and forests is fairly limited (see Table 1). The high rate of population growth (ranging from 2.9 per cent in Pakistan to 2.1 per cent in India during 1995-96) and low genuine savings rate has resulted in negative growth in per capita real wealth in most of the countries viz. Bangladesh, India, Nepal and Pakistan in the region. Negative growth in per capita wealth is likely to have significant impacts on natural resource and human capital availability which are both essential for future development. Nonetheless, there is much to build on.

The region's rich diversity of developmental experiences promises huge dividends if carefully shared. For instance,

Bangladesh provides a good example of managing demographic transition despite significant resource constraints. It achieved impressive success in reducing fertility over a historically short period of time from 6.3 in 1975 to 3.3 in 1994. As a result, the rate of population growth decreased from 2.9 percent during the mid-seventies to 1.6 percent in mid-nineties. Similarly, India offers useful lessons in managing Green Revolution technologies with only moderate environmental damages, and, Sri Lanka, with a literacy rate of 88 percent, shows the way towards human capital development. Bhutan is a unique example of the 'middle path of sustainable development', which it is trying to achieve through the prudent management of eco-tourism and hydro-electricity. Similarly, Nepal is trying to respond to the challenge of environmental degradation by exploring various institutional alternatives. Community forestry in Nepal is a pioneering effort in institutional change and an example for many countries around the world. Likewise, Pakistan offers useful lessons in eco-governance in selected cases.

The need, therefore, is to share these experiences and to build national policies on these diverse successes. The

next step should be to develop a common vision for the region, which can help address transboundary natural resource concerns. Some urgent issues that need to be addressed are watershed management and allocation of water between India-Nepal, India-Bangladesh and India-Pakistan; management of the Sunderbans in India and Bangladesh; fisheries regulations in shared marine ecosystems in the south; and prevention of desertification in western parts of the region. Of course, most of these problems have been extensively debated under bilateral processes. But these bilateral processes are often devoid of any shared understanding about environment and development. Thus, there is a need to establish some common environmental goals and a mechanism to ensure their fulfillment. This would call for undertaking detailed studies based on ecological regions rather than political boundaries. This kind of analyses can help provide more sustainable and perhaps, more acceptable solutions to transboundary problems. SANDEE is helping promote such research by facilitating collaboration between scholars from different countries within the region. This is one small step in the right direction.

**Table –1: Indicators of Economic Development and Environmental Change in South Asia**

Indicators	Nepal	Sri Lanka	Bangladesh	Pakistan	India	South Asia
Population Millions (2001)	23.6	19.6	133.4	141.5	1033.4	1379.8
Avg. annual percent growth (1990-2001)	2.4	1.3	1.8	2.5	1.8	1.9
Density of population (2001)	165	304	1025	183	348	289
GNI per capita dollars (2001)	250	830	370	420	460	450
National poverty lines pop. Below the poverty line (percent) national	42.0	25.0	35.6	34.0	35.0	43.5
Growth in per capita real wealth (1970-93)	-2.6	-	-2.4	-1.7	-0.5	-
Genuine domestic savings (percent of GDP)	0.8	15.5	9.6	0.6	9.0	-
Under-5 mortality rate per 1000 (2000)	105	18	83	110	88	96
Adult literacy rate percent of people 15 and above (2000)	58	88	59	57	43	45
Carbon dioxide emissions Millions to tons (1998)	3.0	8.1	23.4	97.1	1061.0	1194.4
Agriculture productivity agr. Value added oer agri. worker 1995 dollars (1998-2000)	188	753	296	630	397	401
Percent change in forest and wood land	-	17.9	-13.4	19.7	-0.7	-
Conservation index	-	0.595	0.035	0.23	0.20	-
Per capita agri. land (ha)	0.61	0.33	0.10	0.54	0.29	-
Fresh water resources per capita (cubic meters)	8989	2634	9482	1892	1913	-

Sources: Little Green Data Book, 2001, World Bank; World Development Report (2000/2001); Attacking Poverty, 2001, World Bank; World Bank Economic Review, 1999; World Resource Institute, 1994.

***In this section, we present regional and international policy-relevant news, anecdotes and analyses.***

*The leather tanning industry is a major contributor to water pollution in many countries in South Asia. Shahzia M. Khan discusses new developments in Bangladesh and asks whether the solutions proposed will solve the problem?*

### **The Tannery menace in Dhaka: Is relocation the complete answer?**

Shahzia M. Khan,  
IUCN – The World Conservation Union, Bangladesh

The leather industry is the fourth highest revenue earner for Bangladesh. Bangladesh has a total of 270 registered tanneries, out of which 149 i.e. more than 50 percent are concentrated on 25 hectare patch of land in Hazaribagh, a densely populated area in Dhaka on the banks of the legendary Buriganga River. Over the last 50 years, the Hazaribagh tanning industry has grown into an environmental and health menace. Nearly 70 percent of these tanneries are small units with annual production capacity of 0.5 million sq. ft. or less each.

Nearly 21,000 cubic meters of untreated toxic wastes are discharged into the canals and directly into the Buriganga River each day from these tanneries. This has many environmental implications. Low oxygen content of the river water has made it difficult for aquatic life to survive. This polluted water, when used for irrigation, not only pollutes soil, but also contaminates groundwater when it seeps through. Sulphuric acid, which is just one of the 60 toxic chemicals used for tanning, releases corrosive gases that discolour metal objects in neighborhoods near tanneries. In addition, nearly 40-50 liters of water, required for cleansing a single kilogram of leather, flows back into the river untreated. To counter this huge problem only two Chromium treatment plants have so far been installed by two large-scale tanneries for their individual operations.

The industry has had a direct adverse impact on the health of 16,000 workers, out of which 40 percent are children (SEHD 2000). The workers normally work without any protective gear, thus exposing themselves directly to hazardous chemicals. According to a study conducted by The Society of Environment and Human Development (SEHD) morbidity rate of tannery workers is 893.85/1000, as compared to average morbidity rate of Bangladesh which is 150.92/ 1000(BBS, 1999). The recently established local union of tannery

workers at some tanneries has provided free access to medical services. However, there are no medical facilities or risk insurance policies for workers of Hazaribagh area who are worst affected.

Recently, the government has taken up a project to relocate these tanneries to Savar, the proposed Leather Industrial City on the outskirts of Dhaka at an estimated cost of US\$ 48 million. The government plans to bear 43 percent of the total cost, while 57 percent of the cost will be covered through a loan to the tanners. A Common Effluent Treatment Plant (CETP), costing about US\$ 1.3 million, will be set up to reduce the amount of heavy metals from the effluents. Facilities like water, gas, electric supply, and solid waste management system are to be provided by the government free of cost under the project. But all this happens only after the relocation has been completed and the tanneries start operating at the new location. However, in the meantime, the project has run into rough weather as the tannery owners and Bangladesh Tanneries Association (BTA) have placed various demands and conditions, which the government is not in a position to meet. BTA believes that under the present circumstances, it will be another ten years before the tanneries are finally shifted.

It is regrettable that in the absence of any CETP in the Hazaribagh area, the tanneries would continue to pollute the surroundings for the ten odd years that the relocation is expected to take. Even though Environment Conservation Rules 2000 have a clause on Environmental Impact Analysis for the tanneries and DoE has prepared general EIA guideline (1999), they are not being implemented. There are many unresolved issues such as compensation for relocated workers, health insurance scheme and risk adjustment policies for workers, standards and code of conduct for the tanners (including the tenants), incentives and training for adopting low-cost pollution reduction techniques, compensation to the farmers and other local people who incurred losses due to tannery pollution etc. Without the settlement of these, relocation will not be as beneficial as it ought to be.

The leather industry of Bangladesh is now headed towards establishing a strong presence in the global market of finished leather products. At this point in time, if the much-needed policy changes are not brought about, by the time the Hazaribagh tanneries are actually shifted to the new location, they would have caused irreparable environmental and health damages.

*Shahzia Khan can be contacted at [shahzia77@hotmail.com](mailto:shahzia77@hotmail.com) for further details.*

## Soil Conservation in Tea Lands of Sri Lanka: Who Benefits?

J. A. A. M. Jayakody  
Tea Research Institute, Sri Lanka

Tea is one of Sri Lanka's major crops and occupies about 12 percent of the total cultivable land of the country. Tea is cultivated on high, medium and low altitudes. While the eastern and western slopes of the Central Hills are the location for high and medium elevation tea fields, low elevation tea is grown in the southern part of the country. An issue that is currently worrying the tea industry is soil erosion from tea fields, which tends to lower land productivity and tea quality. Studies show that the rate of erosion varies with land elevation and the type of tea that is grown.

Soil erosion causes onsite damages because of displacement of topsoil. The effects of soil loss from tea lands are reduced soil fertility, reduced fertilizer-use efficiency and low production. All these factors affect the private profitability of tea producers, especially in higher elevations. The offsite effects of soil erosion from tea estates are mainly loss of hydropower and irrigation capacity due to siltation of reservoirs. For example, tea plantations cover 25 percent of the Upper Mhaveli Watershed (UMW) area. It is estimated that the total offsite cost of soil erosion in UMW was Rs 22.33 million in 1993 (Gunatilake, 1998).

Tea can be an environment friendly crop if grown with proper soil conservation practices. Inadequate soil conservation is a

perennial problem. The most plausible reason for non-adoption of conservation practices by tea growers is that the money cost of conservation is too high for a private individual to bear and the returns are not enough to encourage such investment. But steps need to be taken to incorporate soil conservation as an integral part of tea cultivation. More so because tea is a major export good and tea production has national foreign-exchange implications. In addition, there are other ways in which tea affects the economy. 80 percent of inorganic fertilizer imported by the country and a major share of hydroelectricity produced is consumed in tea production. Hence, both diminished fertilizer-use efficiency caused by soil degradation and siltation of reservoirs result in social costs.

A key question is who should bear the additional costs of investing in soil conservation? Since the benefits of conservation practices accrue to both individuals and the state and costs of not adopting them are huge, tea growers expect investments to be made by the state. It is timely to revisit the costs and benefits of soil conservation in tea lands and identify who gets the benefits and who needs to make the investment.

*Asoka Jayakody has begun a research project to address some of the questions she raises above. Her work is particularly significant because of her role as a researcher for the tea industry. She can be contacted at [a\\_jayakody@yahoo.co.uk](mailto:a_jayakody@yahoo.co.uk)*

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*Pakistan has been attempting to clean its air through a variety of strategies. Rehana Siddiqui, who has recently joined SANDEE as an advisor, discusses some of these strategies, which are as relevant to other South Asian countries as they are to Pakistan.*

## WEB NEWS

### BIBLIOGRAPHIES

The SANDEE website will soon add three new bibliographies. Please visit [www.sandeeonline.org](http://www.sandeeonline.org) to find out more about the following:

- I. 'Economics and Management of Bio-diversity' lists literature on sustainability, resilience, impact assessment, endangered species, and management. It has an added feature, namely, Internet sites on bio-diversity.
- II. 'Economics and Utility of Forest and Mountain Bio-diversity' covers studies on all aspects of forest and mountain ecosystems.
- III. 'Valuing and Managing Coastal and Wetland Bio-diversity' lists studies on valuation, conservation and management. The last section focuses on mangroves and fisheries.

## Air Pollution from Mobile Sources: Rules and their Implementation

Rehana Siddiqui  
Pakistan Institute of Development Economics, Pakistan

The issue of air pollution becomes particularly important in a developing country when growth in industrial and transport sectors is not accompanied by institutional and manpower capabilities to meet environmental standards. In Pakistan, industrial and transport sectors are the two major sources of air pollution. Within a span of 10 years, air pollution has almost doubled in the country.

In Pakistan, the number of vehicles increased from 2.1 million in 1992 to more than 4.6 million in 2002, resulting in air pollution as high as three times internationally acceptable

limits. According to the Ministry of Environment, the average vehicle in Pakistan emits 15-20 times more pollutants than an average vehicle in a developed country. For example, a 1996 survey of D. G. Khan, Multan and Lahore in Punjab province, shows that road-side ambient concentration of total suspended particles (TSP) was 1240, 1030, and 780 respectively — these numbers are far above the internationally recommended levels of 150-230  $\mu\text{g}/\text{m}^3$  for TSP. The ambient concentration of pollutants indicates the urgent need to reduce and control emissions, as abatement costs are possibly lower than the cost of damage. According to a World Bank study, improved urban air can lead to cost savings of more than \$ 1000 per disability adjusted life years (DALY) saved (Klugman 2002).

In response to deteriorating air quality, lead-free petrol and other clean fuels such as CNG have been introduced in Pakistan. During the 1990s, approximately 30 percent of all vehicles were running on CNG. It is claimed that CNG has reduced the pollution load of major cities of Pakistan and also saved foreign exchange. However, no study analyzing these claims is available so far.

The government has started a number of schemes to provide incentives to vehicle users and to promote clean air. For example the first Vehicular Emission Testing Station (VETS) was opened in Peshawar, in 1997, as a part of an Urban Industrial Environment Protection Programme. These testing stations check vehicular emissions, and if the vehicle is emitting below the standard then a green sticker is issued. The immediate expected benefits of this project are reduction in emissions, saving of fuels and reduction in wear and tear of vehicles. The long-term plan is to disseminate the know-how and technology to other parts of the country based on the experience of Peshawar. Until October 1998, VETS had tested 6164 vehicles and 3387 had passed established environmental standards. Since then, 'Tune up' centers have been opened in Islamabad and Rawalpindi, as part of a plan to provide computerized 'tune up' facilities.

Reduction in traffic related air pollution requires various steps such as improvement in fuel quality, technological improvements in vehicles, better maintenance, strict measures to limit congestion, and imposition of fines on polluting vehicles. Vehicular pollution can be controlled if the polluters are forced to internalize environmental costs. Both Command and Control systems and incentive structures can help in curbing pollution. In both cases, effective implementation is the key.

*Rehana Siddiqui is Head of Research at Pakistan Institute of Development Economics. Further details on the topic and complete references can be obtained from Rehana at [s\\_rehana@hotmail.com](mailto:s_rehana@hotmail.com)*

*Neglecting rivers, the perennial sources of water, can have widespread environmental and economic consequences. Rucha Ghate presents a case where this renewable resource is on the verge of losing this property, affecting the complete water scenario of Nagpur city, India, in more ways than can be expected.*

### Rivers: Converting 'Environmental Hazard' back to 'Nature's Blessing'

Rucha Ghate

The Institute for Research and Development, SHODH, India

Rivers have traditionally been more than mere sources of fresh water for the inhabitants of South Asia. Great civilizations have all originated and flourished on the banks of mighty rivers. Right from *Bhagirath*, who is believed to have coaxed the river Ganges to change its course and make the plains of the Indian subcontinent fertile with its water, to Rajendra Singh, who inspired local people to bring the dead *Aravari* river back to life in recent times, we have a history of worshiping existing rivers and rejuvenating dead or dying ones. While *Bhagirath's* superhuman efforts at changing the course of the mighty river have become a part of the mythology, *Aravari's* coming back to life is here to be witnessed, admired and learnt-from by the present generation.

River Nag is one such renewable resource, which is on the threshold of becoming a stinking gutter. Nagpur City grew on the banks of the river and is believed to have obtained its name from it. Sadly, residents now consider the river an open sewer and a convenient place for disposal of all kinds of garbage. The municipal corporation releases untreated sewage into the Nag, factories do not hesitate to dump solid/liquid wastes in it, and the solid waste from the large vegetable, fruits, and grain markets that cater to central India are swept into the gutter that was once a rumbling river. Total apathy on the part of the Nagpur Municipal Corporation is partly responsible for the state of the river.

Some environment enthusiasts have recently traced the origin and the course of the river. It originates in the hillocks of *Lava*, west of Nagpur. Out of this, flow two major streams, forming a lake each, before the river meets the River Pili. The topography of the region is such that the two ponds together with the river recharge the groundwater of the city. Nag, as a vibrant river running its bumpy way down a natural slope, had a self-cleansing capacity. This meant that all the aquifers that depended upon it got recharged with clean water. But now, the pollution of the river has caused contamination of groundwater as well. As a result, people depending on wells as their source of free water are compelled to buy it from the municipal corporation. This added demand for potable water



is met from a surface water source that is located 60 kms outside the city. Naturally the cost of water and the burden on public water supply has shot up. Another resulting disadvantage is over-dependence on a single source of water, where a minor technical error could cause a total breakdown of supply.

In the case of Nagpur, cleaning one river can generate multiple positive externalities such as revived wells, cleaner ground water and multiple sources of water. Motivated by the significance of reviving the Nag, the Vidarbha Nature and Human Science Center, a local NGO, formed the Eco-City Foundation five years ago and prepared a Nag River Basin Eco-development plan. Further, the National Environmental Engineering Research Institute (NEERI) undertook a survey of the river and submitted its findings to the Central Government, endorsing the feasibility of reviving river Nag. To revive the Nag, experts recommend a combination of wastewater treatment plants and forest plantations to protect the watershed, use of abundantly available sunlight to kill bacteria, and segregation of solid waste by digging pits on the banks of the river.

Based on the technical plans, the Municipal Corporation finally made available funds to the Eco-City Foundation to undertake the 'river revival' project. Yet, no progress has so far taken place. It is only now that the authorities as well as NGOs have realized that the mammoth task of reviving a dying river is not possible by simply making funds available or with one NGO's efforts alone. People's participation is absolutely necessary because multiple sources pollute the Nag. A lot of spadework is needed to build awareness amongst the citizens of the city. It is heartening to note that this initiative has come recently from an unexpected source – a local daily has begun to publish reports based on studies and views of prominent citizens, and, is indirectly lobbying local authorities to take action. It indeed takes many *Bhagiraths* to ensure and sustain benefit flows from nature's boons.

For further information, Rucha Ghate can be contacted at [ghates@nagpur.dot.net.in](mailto:ghates@nagpur.dot.net.in)

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*The Nepal Government is currently facing a major revenue crunch as a result of the Maoist uprising, consequent political instability, and the collapse of the tourism industry. At this juncture, the success of community forestry and resulting revenues has motivated the government to replicate this model in other sectors. Manik Duggar argues that the government needs to carefully manage its need for tax revenues with genuine decentralization that goes beyond a desire to raise taxes.*

## Learning from the Community: Looking beyond revenue.

Manik Duggar,  
SANDEE, Nepal

Nepal is well known for its accomplishments in community forestry. In the eighties, the government initiated a program to hand over management of forests in the mid-hills of Nepal to local forest user groups (FUGs). So far, approximately 9 lakh hectares of forests are managed by FUGs and these groups have succeeded in improving forest cover. Success is not limited to an increase in quality and cover of forests; community forestry has also made communities self reliant, helped them generate income, and empowered them to make decisions about the natural resources on which they depend. The government's income from forests has also increased. For instance, in one case in the Western Terai, prior to community forestry, the government collected only Rs. 3000 annually from a 200-ha forest patch by selling rattan. The forest department now earns about Rs. 3 million per annum from the same forest (CFFS-NEFEJ 2002).

In 2001, given the success of community forestry, the government of Nepal proposed to collect 40 percent of the income from community forests in the Terai as tax revenues. This order was delayed by a legal case brought to the Nepalese Supreme Court, which ruled against the government. However, in the latest budget (2003-04), the government again announced, through a Royal Ordinance (in the absence of an elected Parliament) that 40 percent revenue from the total income of all community forest user groups (irrespective of their location) be collected.

## ACHIEVEMENTS...

We are glad to inform you that Arun K.C. has received the Japanese Government Scholarship for doctoral studies in Rural Economics. He will begin his Ph.D. in October 2003.

Bhim Adhikari has successfully defended his Ph. D. thesis. He has also been awarded an Economic and Social Research Council (ESRC) postdoctoral fellowship at the University of York beginning from the 1<sup>st</sup> of October this year.

Rucha Ghate received a Best Teacher Award for teaching "Research Methods and Designs" at the School of Environment and Resource Development (SERD), AIT, Bangkok. She is the first visiting teacher to be honored with this students' evaluation-based award.

Congratulations!

Nepal is currently going through major political uncertainties due to the Maoist movement. Keeping in view the political instability, no new investment is being made in the private sector; rather, the key foreign currency earner and revenue generator, the tourism industry, is in shambles and on the verge of collapse. The government coffers are empty and revenue has declined drastically. This is clear from the fact that the gap between government expenditure and revenue mobilization has increased by 1.3 percent of GDP during fiscal year 1999-2000 and 2000-01. Similarly, revenue surplus for the same period for total development expenditure dropped from 26.4 percent to 16.5 percent (MOF 2002). On

top of this, for a country where over three-fourth of development expenditure comes from external sources, the donor community seems skeptical to provide more funds in such uncertain political climate. The government is therefore scrambling for new revenue sources.

Given the above background, it is not surprising that the Government would like to replicate the community forestry model in other sectors, with a view to maximizing revenue. Recently, the government announced that the management of the irrigation sector would be devolved to local user groups. Similarly, the government has also discussed the

## SANDEE Training Activities

*SANDEE organized two training courses during the first half of this year. Please read on to find out more about these courses*

### Policy Research and Proposal Writing Workshop in Environmental Economics, Bangladesh, April 2003

Manik Duggar

One of SANDEE's key aims is to advocate policy reform and influence policy-making in South Asia with the help of environmental economics tools and techniques. In line with this objective, a *Policy Research Proposal Writing Workshop in Environmental Economics* was held in Dhaka in April.

The Dhaka workshop sought to expose participants to important environmental policy issues in Bangladesh and the region and to use these discussions to motivate serious research. Thus, each day, policy experts raised a specific problem and analyzed it in its various details. Several case studies, pilot projects and applied environmental economics research results were presented to a select group of researchers, practitioners, policy makers and students. This was followed by discussions on the use of economics to address these problems. The workshop not only created awareness about the use of environmental economics as a policy tool, but also provided practical information and hands-on techniques that can be used by policy makers and practitioners.

The second objective of the workshop was to provide training in logical thinking, research proposal writing and presentation skills. An indirect aim was to introduce SANDEE and its

research program and to encourage participants to submit research proposals to SANDEE. The workshop also provided an important opportunity for individuals and institutions engaged in environmental economics in Bangladesh to interact with each other and build strategic partnerships.

Faculty at the training workshop included Dr. A. K Enamul Haque and Dr. I. M. Faisal from North South University, Dhaka; Dr. Sajjad Zohir and Dr. M. Asaduzzaman from Bangladesh Institute of Development Studies, Dhaka, Dr. Ainun Nishat, Country Representative, IUCN – Bangladesh, Dr. Joyashree Roy from Jadavpur University, Calcutta, India, Dr. Paul Martin, World Bank and Mr. Manik Duggar, Program Manager, SANDEE. Out of the sixteen participants of the workshop, the majority were young researchers from Bangladesh. One mid-career researcher from Sri Lanka, two faculty members from the Economics Department, Patan Multiple Campus, Nepal, and one young researcher from Pakistan also participated in the course.



*Policy Research and Proposal Writing Workshop Participants, Dhaka, Bangladesh*

possibility of decentralized management of several national parks. Another area being considered for local community (including through cooperatives) management is distribution of electricity and revenue collection.

Finer observation reveals that in all the sectors that are to be handed over to local communities, the government has failed to perform and has neither been able to manage resources efficiently nor been able to generate enough revenue. It is time for the government to also look proactively at sectors that are doing relatively well and start a process of handing these over to local communities and the private sector, where needed.

Furthermore, if the government's decisions are based merely on myopic revenue grabbing, it would only discourage communities who have successfully managed their resources, and reduce the potential for replicating the community forestry model. The government is on the right track on decentralizing and encouraging local participation. A vision to look beyond revenue, is all that is needed to complete the picture!

For details and references, please contact Manik Duggar at [manikd@sandeeonline.org](mailto:manikd@sandeeonline.org)

### Advanced Course in Household Economics and Natural Resource Management in Sri Lanka, June 2003.

Purnamita Dasgupta

SANDEE organized an Advanced Course in Household Economics and Natural Resource Management from 16<sup>th</sup> to 27<sup>th</sup> June, 2003, at Waikkal, Sri Lanka. The Course Director was Prof. Stein Holden, Professor in Development Economics, Department of Economics and Resource Management at Agricultural University of Norway. The participants belonged to teaching and research institutions of South Asia with common interests in applied household economics. Jeetendra Aryal, also from the Agricultural University of Norway, needs special mention for providing valuable teaching assistance.

The 12-day course was designed to provide in-depth understanding of a range of topics, alternating theoretical teaching in the morning with real world empirics in the afternoons. A review of the neoclassical farm household model with perfect markets along with the other extreme of a Robinson Crusoe economy with no markets, provided the starting point for the gradual introduction of more advanced theoretical and mathematical models of farm households. Theoretical developments on market imperfections and market failures were discussed in the context of policy reforms. Many important questions arose as we moved into the realities of a second best world. This made for stimulating discussions that carried on much beyond class hours.

To discuss a few highlights, a lecture on variations in understanding of common concepts such as the term "externality", resulted in an interactive session that went on forever. It was a great learning experience - agreeing to

disagree on a consistent set of definitions for terms that we all thought we knew so well and, used so often!

A group exercise required participants to identify and model natural resource use among rural households. This activity created substantial interest among participants and had positive externalities for those of us researching natural resource management issues at the household level, including ongoing SANDEE projects.

In short, the participants benefited from exposure to the latest theoretical developments and professed that the course would help them in furthering their academic interests, through both teaching and research activities. The amenities provided at the Club Hotel Dolphin enabled the course to be conducted efficiently, encouraging interactions amongst the tutor and the taught, both inside and outside the classroom.

Evening activities such as pool volleyball and long walks on the beach certainly contributed to the success of the course. To sum, a re-confirmation of the SANDEE motto, "learning with fun".



Participants at the Household Modeling and Natural Resource Economics Workshop, Colombo, Sri Lanka

## PROFILE

Pakistan Institute of Development Economics, Islamabad, Pakistan

The Pakistan Institute of Development Economics (PIDE) was established as an autonomous research institute in 1957. It is now one of Pakistan's premier research centers, with research divisions in Macro Management, Trade and Industry, Agriculture and Rural Development, Socio-Cultural Process and Labour Market Issues, Population and Training and Project Evaluation. PIDE's international advisory board includes renowned economists and demographers such as Professor Lawrence Klein, Professor H. W. Singer, Professor Paul P. Streeten, Professor A. J. Coale, Professor Just Faaland, Professor Albert O. Hirschman, Professor J. Kornai, Professor E. Malinvaud, Professor Gustav Ranis, and others. Theoretical, empirical and policy oriented research at PIDE has contributed to significant development economics literature and policy formulation in Pakistan. PIDE also publishes a quarterly Journal, "*The Pakistan Development Review*". The Pakistan Society of Development Economists (PSDE), which is a professional society of over two hundred economists, is housed at PIDE.

Three years ago PIDE started a Ph. D. Program in Economics. This is a four-year program with 2-years intensive course work of 49 credits and 2-years research in any area of specialization. The program offers specialization in the following areas: Agricultural Economics, Applied Econometrics, Development Economics, International Economics, Industrial Economics, Public Finance, Mathematical Economics, Monetary Economics, Human Resource Development, Population Dynamics, and Economic Growth and Distribution. Keeping in view the significance of Environmental Economics, recently two courses in Environmental Economics have been added to the list of courses.

Applications for Ph.D. admissions are invited every summer. Admission is open to Pakistani and foreign students with at least a masters degree in economics (including agricultural economics), statistics, and mathematics. Admission is based strictly on merit. Detailed information about PIDE and its Ph.D Program can be downloaded from [www.pide.org.pk](http://www.pide.org.pk). For further information, the staff at PIDE can be contacted at: [pide@apollo.net.pk](mailto:pide@apollo.net.pk) or [pide@isb.paknet.org.pk](mailto:pide@isb.paknet.org.pk)

## ANNOUNCEMENTS...

Papers invited for the **10<sup>th</sup> Biennial Conference of the International Association for the study of Common Property (IASCP)**

([www.iascp.org](http://www.iascp.org))

Universidad Nacional Autonoma de Mexico, Oaxaca, Mexico is hosting the 10<sup>th</sup> Biennial Conference of the International Association for the study of Common Property (IASCP) between August 23<sup>rd</sup> and 27<sup>th</sup> 2004. The theme and title for the conference is "The Commons in an age of Global: Transition: Challenges, Risks and Opportunities".

Deadlines: 30<sup>th</sup> October 2003 for panel papers and abstracts.  
15<sup>th</sup> April 2004 for submission of papers.

Call for proposals from **SANEI**

([www.saneinetwork.org](http://www.saneinetwork.org))

South Asian Network for Economic Research Institutes (SANEi) has invited research proposals on general issues in development and role of institutions in development with reference to South Asia. Proposals could relate to a single country or more than one in a comparative framework.

Deadline for submission of Proposal: 30<sup>th</sup> Aug 2003

Papers invited by CGIAR system-wide program on **Collective Action and Property Rights (CAPRI)**

([www.capri.cgiar.org](http://www.capri.cgiar.org))

CAPRI invites papers for its workshop on **Property Rights, Collective Action and Local Conservation of Genetic Resources**, to be held at Rome, Italy between 29<sup>th</sup> September-2<sup>nd</sup> October 2003. This workshop seeks to bring together researchers from various social and natural science disciplines who have been investigating institutional themes surrounding local-level conservation of crop varieties and livestock species.

Deadline: 15<sup>th</sup> September for submission of papers.

**12<sup>th</sup> World Forestry Congress**

([www.wfc2003.org](http://www.wfc2003.org))

12<sup>th</sup> World Forestry Congress is going to be held at Quebec, Canada, between 21<sup>st</sup> and 28<sup>th</sup> September 2003.

**Environmental Economics and Natural Resource Management Course**

([www.sandeeonline.org](http://www.sandeeonline.org))

SANDEE is organizing a three-week training course in Environmental Economics at Bangkok between October 30<sup>th</sup> and November 16<sup>th</sup>, 2003. The course is meant for

economists interested in upgrading their skills and learning related to Environmental Economics. Interested applicants from South Asian countries can send their applications and detailed CVs by August 22, 2003 to: [info@sandeeonline.org](mailto:info@sandeeonline.org)

## RESEARCH & TRAVEL GRANTS...

Travel Funding Opportunity from **Commonwealth Science Council (CSC)**  
([www.comsci.org](http://www.comsci.org))

Commonwealth Science council offers travel funding to scholars from commonwealth countries for participating in conferences. Travel grants cover airfares and registration fees (but not local expenses) for participation in international conferences, major meetings and short technical in-service training. Applications are accepted at the CSC Secretariat in London at least eight weeks before the conference, meeting, or course date. Applications are considered for funding six times a year, during the first weeks of February, April, June, August, October, and December. For more details contact: [science@commonwealth.int](mailto:science@commonwealth.int) or visit <http://www.comsci.org/grants/g-docs010.htm>.

**Dorothy Leet grants**  
**International Federation of University Women,**  
**Switzerland**  
(<http://www.ifuw.org>)

This competition is held in even-numbered years to award grants that assist women graduates from countries with low per capita income, or they may be given to other women graduates who wish to work as experts in these countries or whose research is of value to such countries. Grants may be used for obtaining special training essential to research and survey work; training in new techniques in group research and further study; or carrying out independent research or

## ON THE FUNNIER SIDE: BY POPULAR REQUEST...!!!!

An Environmental Economist mother found how profoundly economics had entered her life when

- She tried to calculate her 3 year old son's discount rate by seeing how many sweets he would require to be promised to him after dinner to be equivalent to one sweet before dinner.
- She spent one hour in a toyshop making up over 20 bundles of toys that could be purchased for \$25 and then asked the son to select one of the bundles.

surveys, including completion of projects well advanced at the time of application. Contact national headquarters for the exact deadline date.

### Aga Khan Foundation (AKF)

[http://www.hon.ch/Misc/Sponsor/aga\\_khan.html](http://www.hon.ch/Misc/Sponsor/aga_khan.html)

AKF provides grants to grassroots organizations for projects with a focus on three issues, namely, (1) **health systems**; (2) **education** including early childhood care and development; and (3) **rural development** and **income generation** to alleviate poverty.

### Conservation Food and Health Foundation, Inc.

<http://www.grantsmanagement.com/cfhguide.html>

email: [cfhf@grantsmanagement.com](mailto:cfhf@grantsmanagement.com)

The foundation supports special projects and programs of nonprofit organizations in three primary fields of interest: conservation, food and health. The foundation concentrates its grant-making on research, technical assistance and training projects of benefit to the Third World; favors grants for pilot projects and special programs that have potential for replication; prefers to support projects that employ and/or train personnel from the developing world; and favors research concerning problems of importance to the developing world.

## BOOKS ...

Borrini- Feyerabend, G, and T. Farvar eds. 2002. *Policy Matters: Sustainable Livelihoods and Co-Management of Natural Resources*. Gland, Switzerland: IUCN.

Laird, S.A., ed. 2002. *Bio-diversity and traditional Knowledge: Equitable Partnerships in Practice*. Sterling, VA: Earthscan.

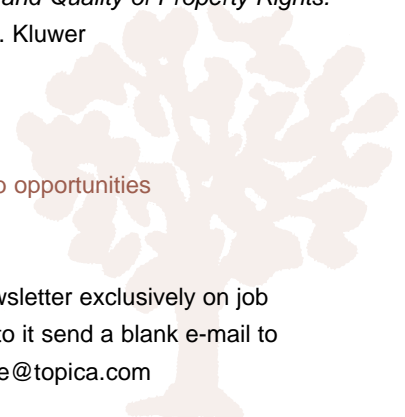
Falque, M., M. De Alessi, and H. Lamotte, eds. 2002. *Marine Resources: Property Rights, Economics, and Environment*. New York: Elsevier.

Fuchs, D.A. 2003. *An Institutional Basis for Environmental Stewardship: The Structure and Quality of Property Rights*. Dordrecht, The Netherlands. Kluwer

## JOBS...

**EPSA-ECP** newsletter of job opportunities  
[www.topica.com](http://www.topica.com)

EPSA-ECP brings out a newsletter exclusively on job opportunities. To subscribe to it send a blank e-mail to [development.work-subscribe@topica.com](mailto:development.work-subscribe@topica.com)



## OPPORTUNITIES...

**Jadavpur University** is the first Indian university to earn the status of SYLFF (RYOICHI SASAKAWA YOUNG LEADERS FELLOWSHIP FUND) institute. SYLFF is a fellowship programme of The Nippon Foundation, a Japanese non-profit foundation administered by Tokyo Foundation. The objective of this program is to support the education of students enrolled in MA, M.Phil. and Ph.D degrees in the Faculty of Arts. These fellowships will be awarded to outstanding students majoring in social sciences and humanities and whose studies focus on the themes, Tradition, Social Change and Sustainable Development and adopt a Holistic Approach, i.e. any issue or problem relevant to contemporary Indian society. This opportunity is open to all students — the awardee of the fellowship is expected to enroll with Jadavpur University for the program. This grant was made possible because of the hard work and initiative taken by Joyashree Roy.

### Vacancy in IFPRI

([www.ifpri.org](http://www.ifpri.org))

The International Food Policy Research Institute (IFPRI) seeks Research Fellows/Senior Research Fellows to lead

research programs in the Development Strategy and Governance and Food Consumption and Nutrition divisions. The positions are fixed-term, for three years, and renewable, based at IFPRI headquarters in Washington, DC.

The closing date of receiving applications is 31<sup>st</sup> October 2003.



*Evaluator and Committee Member having informal discussion in Colombo*

## EVALUATOR'S RECOMMENDATIONS FOR SANDEE...

A two-member team comprised of Dr. A. Vaidyanathan and Dr. Stein Hansen recently evaluated SANDEE. The evaluation was very positive about SANDEE's aims, activities and the need for such a network. The evaluators also provided some constructive recommendations for furthering SANDEE's activities. Their suggestions basically pertain to enhancing the outer limits of the activities currently undertaken in order to be able to tap new talent. Here we summarize the main recommendations:

- SANDEE should expand the scale of its activities at a reasonable, manageable rate and this requires larger and sustained financial support from donors for several years to come.
- The main activities of the organization should continue to focus on training, research, documentation and dissemination with expansion in some areas, consolidation in some and reorientation in others.
- Proposal Writing workshops and the general course in Environment and Natural Resource Economics should continue as regular annual features.
- Training in econometrics and special topics such as CGE can be provided as special sessions that are part of the biannual research and training workshops.

- Research could over time focus more specifically on carefully identified themes. Theme-centric research should be tried in alternate rounds after reviewing SANDEE's experience in 2-3 years time.
- Researchers should be encouraged to distinguish between (a) 'macro' assessment of the socio-economic impact of changes in environment and of efforts put into mitigating them; and (b) the manner in which this impact affects different regions and classes of households and how household level actions may affect the macro processes.
- SANDEE should bring out edited collections of research findings on different themes and that their policy implications be highlighted and publicized in the form of Policy Briefs.
- Grantees who have completed their research should be encouraged to strengthen their network and help SANDEE in building bibliographies, data banks and updating of research reviews on different themes, and also by inducting them as resource persons for the various training programs.

These recommendations will go a long way in strengthening SANDEE's capacity building activities in South Asia.



South Asian Network for Development  
and Environmental Economics.

# MEMBERSHIP FORM

## General Information

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

## Mailing Address

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

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

Payment Details (Enclose Cheque/Draft)

Cheque No..... Amount (in US\$).....  
Drawn on (Name of Bank).....  
Membership Fee for the Year .....

Notes: This form is for institutional members only. The institutional membership fee is US\$25 per year for South Asian institutions and US\$250 per year for non-South Asian institutions. Please do not send cash.

Information about SANDEE and our activities can be available online at [www.sandeeonline.org](http://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 programs, please write to Manik Duggar at [manikd@sandeeonline.org](mailto:manikd@sandeeonline.org)





South Asian Network for Development  
and Environmental Economics.

**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](mailto:info@sandeeonline.org)

Information about SANDEE and our activities can be  
obtained online at [www.sandeeonline.org](http://www.sandeeonline.org)

If you have any questions about our programs please  
write to Manik Duggar at [manikd@sandeeonline.org](mailto:manikd@sandeeonline.org)

S

**Oct. 30 - Nov. 16, 2003**

Regional Course in  
Environmental and Natural  
Resource Economics, Jointly  
organised by SANDEE and  
the World Bank Institute, at  
AIT Center, Bangkok, Thailand

T

N

**Nov. 18 - 22, 2003**

SANDEE'S 7th Biannual  
Research and Training  
Workshop in Bangkok,  
Thailand.

E

V

**Dec. 18 - 20, 2003**

Third Biennial Conference of  
the Indian Society for  
Ecological Economics  
(INSEE), Calcutta, India.

E

