



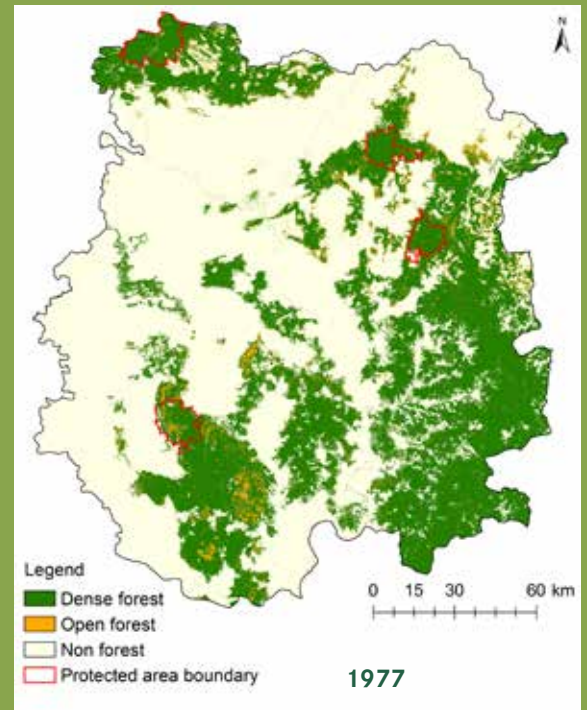
SANDEE 

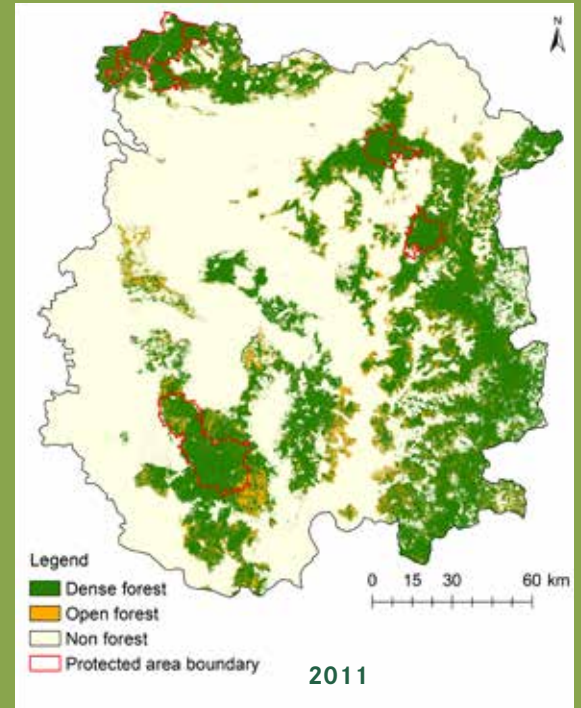
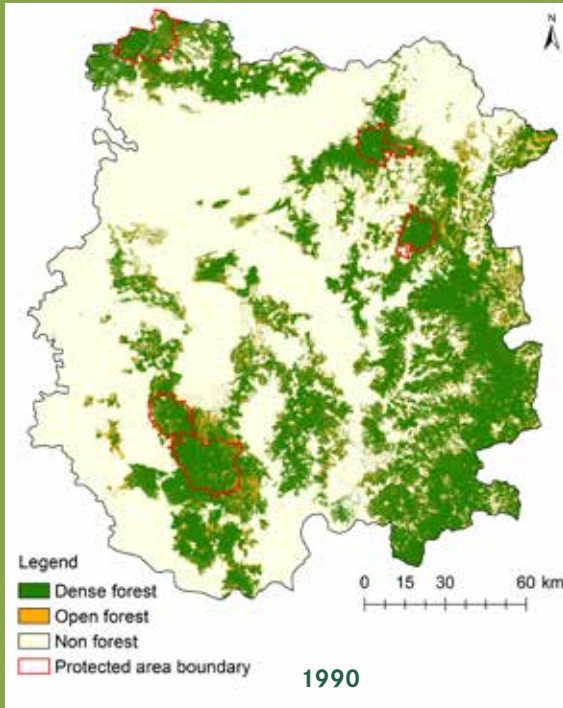
Annual Report

2015

ECONOMICS & THE ENVIRONMENT

As South Asia spends its abundant natural capital, it must look to secure the future of natural resources and ecosystem services for the well-being of its people.





SANDEE research shows a steady decline in forest cover in Maharashtra, India. Source: Forest Conservation outside Protected Areas: Three Decades of Forest Change in a Central Indian Tiger Corridor by Shivani Agarwal, Harini Nagendra and Rucha Ghate, Working Paper No. 105

Researchers who examine **changes** in the natural world **reveal the power** and importance of sustainable development **policies** and their effect on poverty reduction and economic growth.





Since 2000,
SANDEE has been
transforming
research on economic
development and
environmental change
into **knowledge**
mobilization for
policy reforms.

**Published by:**

SANDEE

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Map on pages 20-21 prepared with help from www.db2map.com.

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A LETTER FROM OUR DIRECTOR

Dear Friends,

2015 was another good year for SANDEE, including well-deserved **recognition** for a number of SANDEEites. Indrila Guha became Principal of Basanti Devi College, Calcutta University. The Government of Karnataka honored S. Madheswaran for his public research service. SANDEE founder Sir Partha Dasgupta received the 24th Blue Planet Prize from the Asahi Foundation of Japan. Amrita Ghatak's Ph.D. thesis was selected for the coveted Professor VKRV Rao Memorial Prize in Economics by the Institute for Social and Economic Change, Bangalore. Bishal Bharadwaj of the Ministry of Federal Affairs and Local Development in Nepal received a Chevening Scholarship to pursue a MSc in Climate Change at University College London.

SANDEE researchers continued delving into links between poverty and the environment. In Nepal, SANDEEites are offering policy information and advice on **Greening Development** to several government ministries regarding plastic bag bans, crop residue burning, REDD+ and targeting of renewable energy subsidies. In Pakistan, researchers are looking at 'clean production' interventions in the tanning industry, which complements completed research on greening the tourism sector in Sri Lanka. In India, SANDEE researchers are beginning to examine the new corporate social responsibility law and whether it contributes to green investments. On the theme of **Climate Change**, SANDEE is increasingly focusing on adaptation strategies and interventions, particularly related to water, agriculture and climate-related disasters. Studies in several countries examine farmer responses to climate change risk and uncertainty; they also ask whether farmer perceptions coincide with objective indicators and what the implications are of a mismatch. **Ecosystems** research is evolving in two strands. One set examines the benefits of ecosystem services and trade-offs associated with managing these services. Another focuses on ecosystem disservices; research continues in Bhutan, India and Nepal to examine the costs of human-wildlife conflicts and benefits associated with mitigation measures.

SANDEE's **policy influence** is growing as researchers reach senior positions in their institutions. In India, SANDEE-related research has been cited in environmental legal cases. Several SANDEEites are linked to a new TEEB India program, and various researchers serve in advisory roles, particularly in their own states. In Nepal, we are directly supporting the REDD+ implementation process. 2015 also saw more publications by SANDEEites than ever before, notably in peer-reviewed **publications**.

Our invaluable **partnership** with ICIMOD continues. Collaborative projects are ongoing, including the REDD+ implementation project and an important new project on Kailash Landscape Valuation. We look forward to continuing our fruitful partnerships, research and expanding policy influence in South Asia.

E. Somanathan
Executive Director





SANDEE Chair Attends COP21

SANDEE Board Chair Adil Najam attended the UN Climate Change Conference of Parties in 2015. Officially, Adil was a delegate from Pakistan, but in many ways, he represents all of South Asia. At COP21 and in all endeavors, Adil brings attention to the realities of living on the front line of changing climate vulnerability – melting glaciers, intense heat waves, monsoons and floods –and the resulting decreases in productivity. He credits SANDEE for preparing researchers with the resources and knowledge in a South Asian context that are required to combat climate change.



2015 in a Nutshell

126 participants in 7 workshops

56 peer-reviewed and popular publications

25 ongoing research projects

18 conference presentations in 10 countries

14 policy briefs

10 working papers

5 new grants issued to researchers

2 collaborative projects: REDD+ and Kailash

Teaching workshops in Bangladesh, Nepal and Sri Lanka

VISION

The people of South Asia, as one of the largest populations affected by the changes in climate, have a voice in the development-environment policies of their villages, cities, regions and countries.



MISSION

Strengthen the capacity of individuals and institutions in South Asia to research and understand links among economic development, poverty and environmental change. Encourage the dissemination and application of research-based information to policies and programs.

OUR MANDATE AND APPROACH

SANDEE is a regional network of analysts that addresses development-environment problems in Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. There are four core activities that support the SANDEE mission.

RESEARCH

A competitive research grants program focuses on ecosystems management, the economics of climate change, and policies and programs for greening development.

TRAINING

International and regional experts teach workshops that build skills in environmental and natural resource economics, policy analyses and research methods.

UNDERSERVED AREAS PROGRAM

Activities, scholarships and courses offer smaller countries and less advanced areas institutional strengthening and improved access to skills and information.

DISSEMINATION AND DIALOGUE

Publications, presentations and curricular materials facilitate information sharing and networking among individuals and institutions.



GOAL

Sponsor and undertake research in South Asia to identify policy and management solutions that help achieve parity between long-term environmental stability and economic well-being.

RESEARCH:

Understanding and Managing our Environment for a Better Future

SANDEE research addresses specific environment-development challenges and ranges from large-scale investigations to in-depth case studies. The three key themes of SANDEE research are **Policies and Programs for Greening Development, Human Interactions with our Ecosystems**, and the **Economics of Climate Change**.

Research is based on both primary and secondary data, and quantitative analysis. SANDEE staff and International Advisors who specialize in environmental economics provide training and mentoring to researchers over a two-year period. Research grants range from USD 20,000-40,000.

In 2015, there were 25 ongoing research projects. SANDEE issued five new grants focusing on ecosystem services and land use changes and new technologies to address climate, water and energy challenges.

Research Grants in 2015



Eshita Gupta, Would Solar Water Pumps Improve Crop Production and Welfare of Indian Farmers?



Badra Sriyani Herath, What are the Implications for Sri Lankans as Home Gardens Erode? (Study Grant)



Adiqa Kiani, What are Pakistanis Willing to Pay for Improved Water Supply in Rawalpindi?



Manjur Morshed, How Vulnerable are Farmers as Land Use Changes from Rice to Shrimp in Bangladesh?



Shamen Vidanage, The Non-Market Benefits of Cascade-Tank Systems in Sri Lanka - Are They Adequate to Promote Investment?

Outcome:
Effective Research



Building and Sharing Knowledge in South Asia

The textile and garment sector is an important, labor-intensive industrial sector in Bangladesh, Pakistan, India and Sri Lanka. The sector provides employment to millions, but also contributes to water and air pollution. SANDEE research efforts have identified strategies to green the garment and textile industry.

Bangladesh:

- strengthen siting regulations
- upgrade government testing laboratories
- regulate sludge storage
- provide guidelines for fines

India:

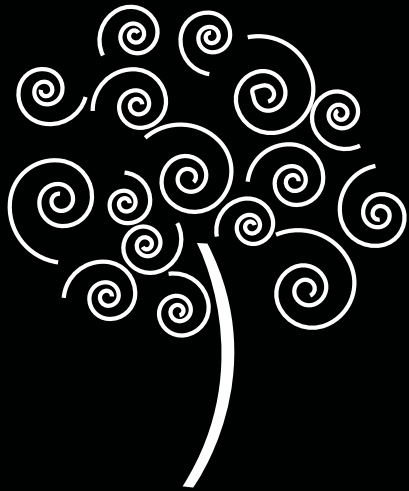
- support effluent treatment facilities in Gujarat
- reduce regulatory burden on small firms
- encourage medium and large firms to seek opportunities to reduce pollution

Pakistan:

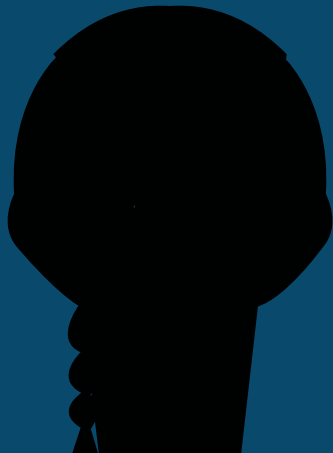
- improve monitoring
- introduce a rating system to trigger competition among firms
- provide district-level training and information services

Sri Lanka:

- learn from existing best practices
- upgrade voluntarily
- respond to market pressure from international buyers



ECONOMICS AND THE ENVIRONMENT



GOAL

Train South Asian researchers in environmental and natural resource economics.

Develop institutional capacity as researchers share knowledge with colleagues and students.

TRAINING:

Strengthening Human Capital

SANDEE courses not only offer budding researchers a way to strengthen skills, they also give more experienced researchers and practitioners insight into local conditions and emerging issues. SANDEE connects researchers and policy makers with experts from the policy and academic arenas inside and outside of South Asia.

Annual winter and summer course sessions offer practical, hands-on knowledge on environment and development topics such as environmental taxes or climate change or mangrove protection to participants from a variety of professional and academic backgrounds. Short, intensive writing seminars target research communication and policy issues. SANDEE trained 126 participants at seven workshops in 2015.

Research Analyses and Write-shop

February 5-9, Kathmandu, Nepal

Writing For Change - Research Communication Workshop

February 10-12, Kathmandu, Nepal

Mangrove for Future - Research Initiatives

February 24-25, Colombo, Sri Lanka

SANDEE - ACD Research and Writing Workshop in Environmental and Natural Resource Economics

May 24-28, Dhaka, Bangladesh

Biannual Research and Writing Workshop

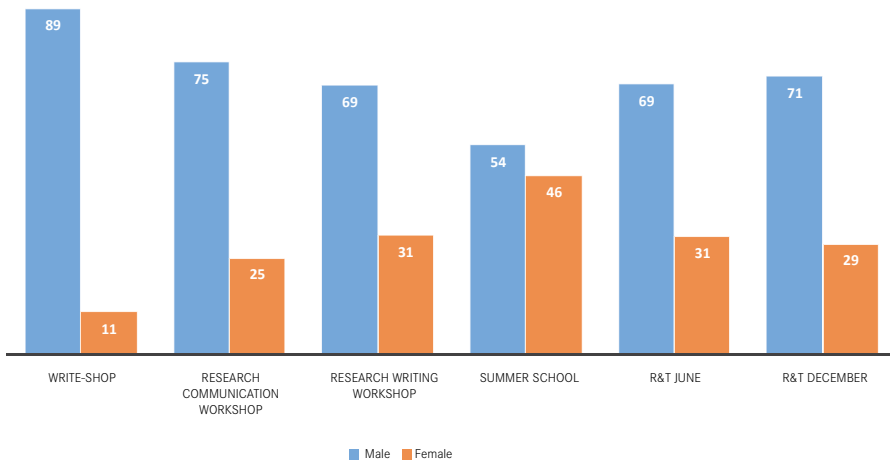
June 29-July 3, Negombo, Sri Lanka

December 10-13, Kathmandu, Nepal

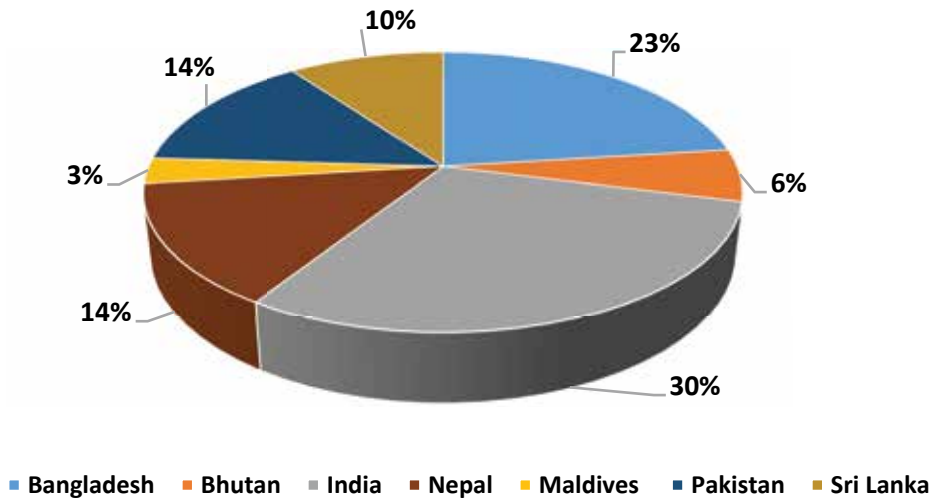
SANDEE- IPS Summer School in Environment and Resource Economics

July 4-10, Waikkal, Sri Lanka

2015 Training Distribution by Gender (%)



2015 Training Distribution by Country



*Outcome:
Skilled Professionals*

Researcher Spotlight

D. W. K. “Kinkini” Hemachandra is a Senior Lecturer at the Department of Business Economics at the University of Sri Jayewardenepura in Sri Lanka. In addition to her degree in Public Administration from Sri Jayewardenepura, Kinkini received a Masters from the Lee Kuan Yew School of Public Policy at the National University of Singapore. She is currently working on a Ph.D. at the University of Huddersfield in the UK.



The close supervision and “painful” training on writing papers and proposals for SANDEE has proven useful in Kinkini’s Ph.D. work. Her doctoral research, at the Global Disaster Resilience Centre at Huddersfield, is in the area of disaster management with a gendered perspective.

Kinkini loves her country and has lived in three separate districts of Sri Lanka with her parents and in-laws. She recommends Kandy for its calm and quiet. She similarly enjoys the peace of Nepal, which she says feels like a second home. Kinkini appreciated the opportunity to travel to Pakistan on SANDEE’s behalf. There she presented her SANDEE research on the environmental practices and management of textile and apparel manufacturers in Sri Lanka at the 17th Annual Sustainable Development Conference.

When not working, Kinkini enjoys family time, cooking and listening to music. She is pleased with her career achievements thus far, and has found a work-life balance that has made her very happy. As a child she vacillated between wanting to be a good housewife and wanting to teach, and as an adult, ended up successful at both. SANDEE is pleased to have assisted in helping Kinkini realize her potential as a happy, well-balanced economist and scholar.

In 2014, Agricultural Economics specialist **R. “Bala” Balasubramanian** gave the keynote address at the 73rd Annual Conference of the Indian Society of Agricultural Economics. As the head of the Market Extension Department at Tamil Nadu Agricultural University with more than 25 publications to his credit, including chapters in books and articles in international journals, Bala was an excellent choice.

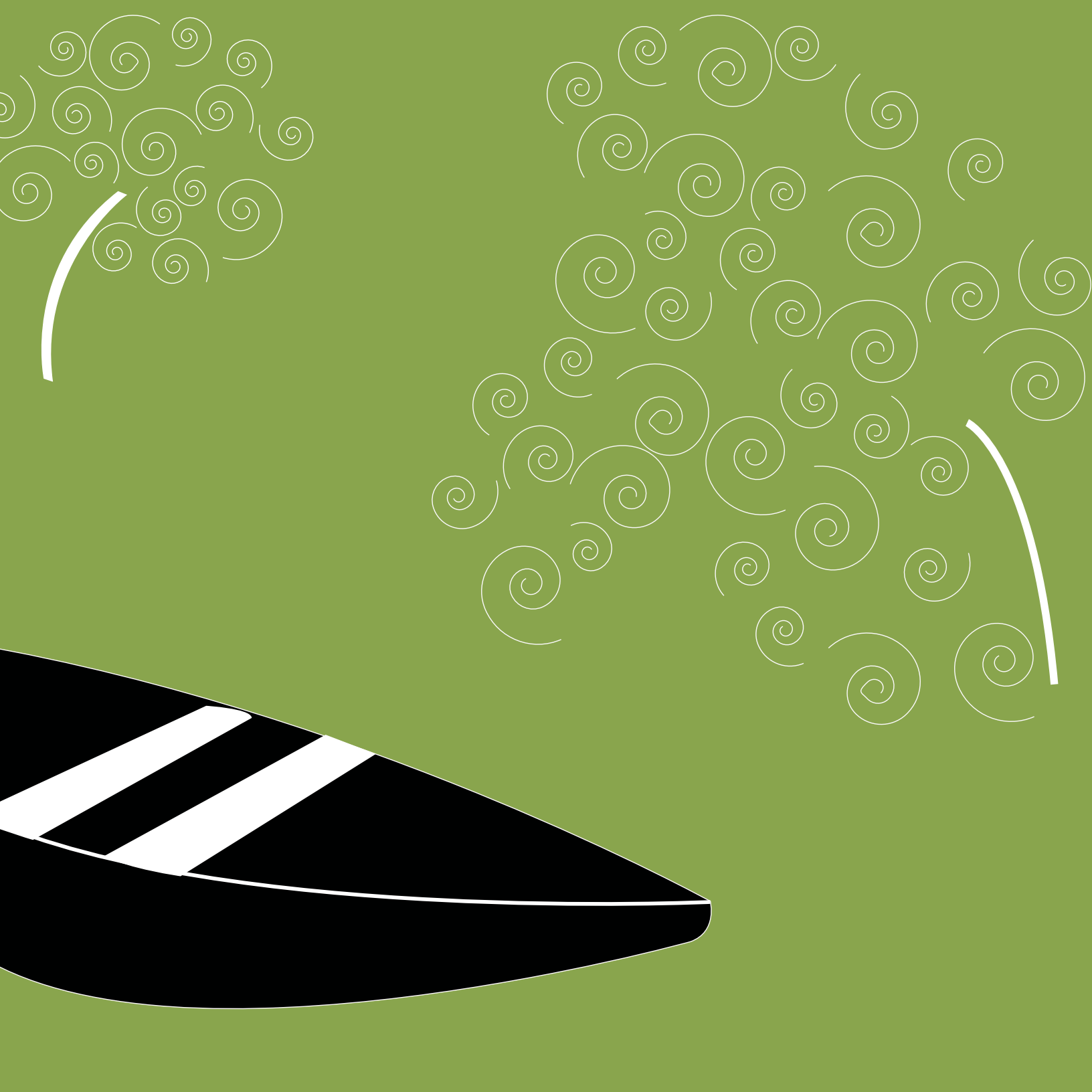
Bala serves on a number of Indian academic and government boards. He earned his Ph.D. from Tamil Nadu Agricultural University, where his thesis investigated factors contributing to groundwater overexploitation in Tamil Nadu. As a post-doc, he traveled to the University of Wisconsin, and has also been a Visiting Scholar in Korea and the USA. He was thrilled at his daughter’s acceptance into the University of Arizona in the USA for graduate school.

SANDEE first connected with Bala some 15 years ago. Via dial-up

internet connection, he read ecological economics papers in his free time at home, and came across SANDEE’s first call for research proposals. His recent research for SANDEE concerned the dynamics of groundwater and climate change in South India, and the links there among poverty, property and natural resource management. He cites SANDEE’s most rewarding aspects as the feedback and support from mentors and resource persons, and the ability to learn from an array of leading experts in the field of environmental economics.

Bala now resides in Coimbatore, but his beginnings were more humble. He grew up on a subsistence farm in semi-arid western Tamil Nadu. However, if Bala had it to do all over again, he would choose the same family and the same rural setting. How many of us are this blessed? SANDEE congratulates Bala on his many achievements and wishes him great success going forward.





GOAL

Build professional skills in relatively underserved areas to enable local researchers to address their communities' environmental concerns.

Underserved Areas Program: Reaching out to Build Capacity

Each year SANDEE increases the total number of trained researchers from relatively remote or under-equipped areas of South Asia. SANDEE holds workshops in underserved locations, invites proposals from area researchers, fields requests for SANDEE materials and publications, and seeks greater exposure through local universities, organizations and media outlets. With these efforts, SANDEE links researchers, and their specific, community environment-development issues, to a larger body of knowledge and ideas.

I am an environmentalist, an ecologist and a scientist, but all my arguments fail when I have to explain human behavior to my students. It was through SANDEE workshops that I realized the missing piece was economics. SANDEE opened my eyes to the realm of human behavior when faced with resource scarcity and how our choices impact our environment. I understand now that environmental sustainability can never be achieved without fully embracing the economic discipline in our education. SANDEE, with their brilliant and yet friendly approach, made me a better person by giving me guidance, and the confidence to embrace research in the field of environmental economics.

Shadiya Fathimath, *Maldives National University*



The Local and the Global in Sri Lanka

In June SANDEE and the Institute of Policy Studies hosted a panel on Sri Lanka's foremost environment and development issues; the panel received significant press coverage. **Professor Hennayake**, Deputy Vice-Chancellor at the University of Peradeniya, presented the broad picture on Sri Lankan environmental challenges. **Dr. Rathnayake**, Director, Environmental Pollution, Central Environmental Authority focused on the connections between pollution and health, pointing to the need for stronger research-policy interactions. **Dr. Senaratne**, Head of Environmental Economics Policy Research, Institute of Policy Studies, spoke about the need for Climate Information Products. **Ms. Neelima Khetan**, Director of Corporate Social Responsibility & Sustainability at Coca-Cola (India and South West Asia) discussed how the voluntary sector is becoming more dependent on the corporate sector, which underscores the need for dialogue among stakeholders.



In 2015 SANDEE researchers from Sri Lanka examined new conservation measures and best practices. **Wasantha Rathnayake** suggests that a re-designed entry fee for the Rekawa Sanctuary would secure the cooperation of low-income fishermen and ameliorate illegal activities associated with harvesting turtle products. This is an important strategy for conserving Sri Lanka's giant marine turtles.

SANDEE and ACD award Fellowships for Bangladeshi Doctoral Candidates

SANDEE launched a Ph.D. Dissertation Fellowship in 2015 to promote interdisciplinary research on climate change and ecosystem services in Bangladesh. Awards, administered by the Asian Center for Development, are applicable for Bangladeshi researchers in the fields of Ecosystem Management, Economics of Climate Change, and Policies and Programs for Greening Development. Three Bangladeshi researchers received fellowships in 2015.

- **H. M. Tuihedur Rahman**, McGill University, Canada, 'Livelihood Vulnerability and Resilience to Climate Change: A Study of the Northeastern Flood Plain Communities of Bangladesh'.
- **Ronju Ahammad**, Charles Darwin University, Australia, 'Reconciling Livelihoods and Conservation in Forest Landscapes of Bangladesh'.
- **Md. Sarwar Hossain Sohel**, University of Southampton, UK, 'Modeling Ecosystem Services and Human Wellbeing using a System Dynamic Approach'.



Outcome: Reciprocal Capacity Building

Nepal Leads the Way in REDD+

Reducing Emissions from Deforestation and Forest Degradation (REDD) has the potential to cut greenhouse gas emissions up to 20 percent globally. REDD is a new and increasingly popular approach by industrialized nations to pay developing countries to improve forest management and increase carbon stocked in forests. SANDEE is collaborating with ICIMOD on examining the implications of REDD+ in Nepal.

A SANDEE team led by Bishnu Prasad Sharma identified how forestry groups in Nepal have managed REDD+ activities. Their study compares community forestry groups who participated in an experimental REDD+ program with those who did not.

The study's most important outcome is that incomes of households who chose to sequester forest carbon were not affected. Communities were willing to accept relatively low REDD+ payments when their regular livelihood benefits from forests did not decline and if they also received technical support for strengthening local community forestry institutions. The REDD+ communities benefitted from other improvements such as the adoption of bio-gas for cooking.

A second SANDEE-ICIMOD study led by Rajesh Rai and Mani Nepal, in tandem with Nepal's Forestry Department, examines the costs and benefits of REDD+. The research will provide information

on how costs of implementation vary across different geographic regions and differently managed forests. It will enable the Government of Nepal to position itself advantageously in international negotiation processes.

In Nepal, the official REDD Implementation Center is run within the Ministry of Forests and Soil Conservation. SANDEE Research Manager Mani Nepal is a member of their Technical Review Committee supporting the National REDD+ Strategy Framework. SANDEE research is contributing to strategic discussions and alerting multiple stakeholders to various options Nepal faces as its gets ready to implement REDD+.



GOAL

Advance the understanding of issues that link poverty, development and the environment to provide academics and policy makers the opportunities to create a better future.

DISSEMINATION AND DIALOGUE: Finding Policy Solutions

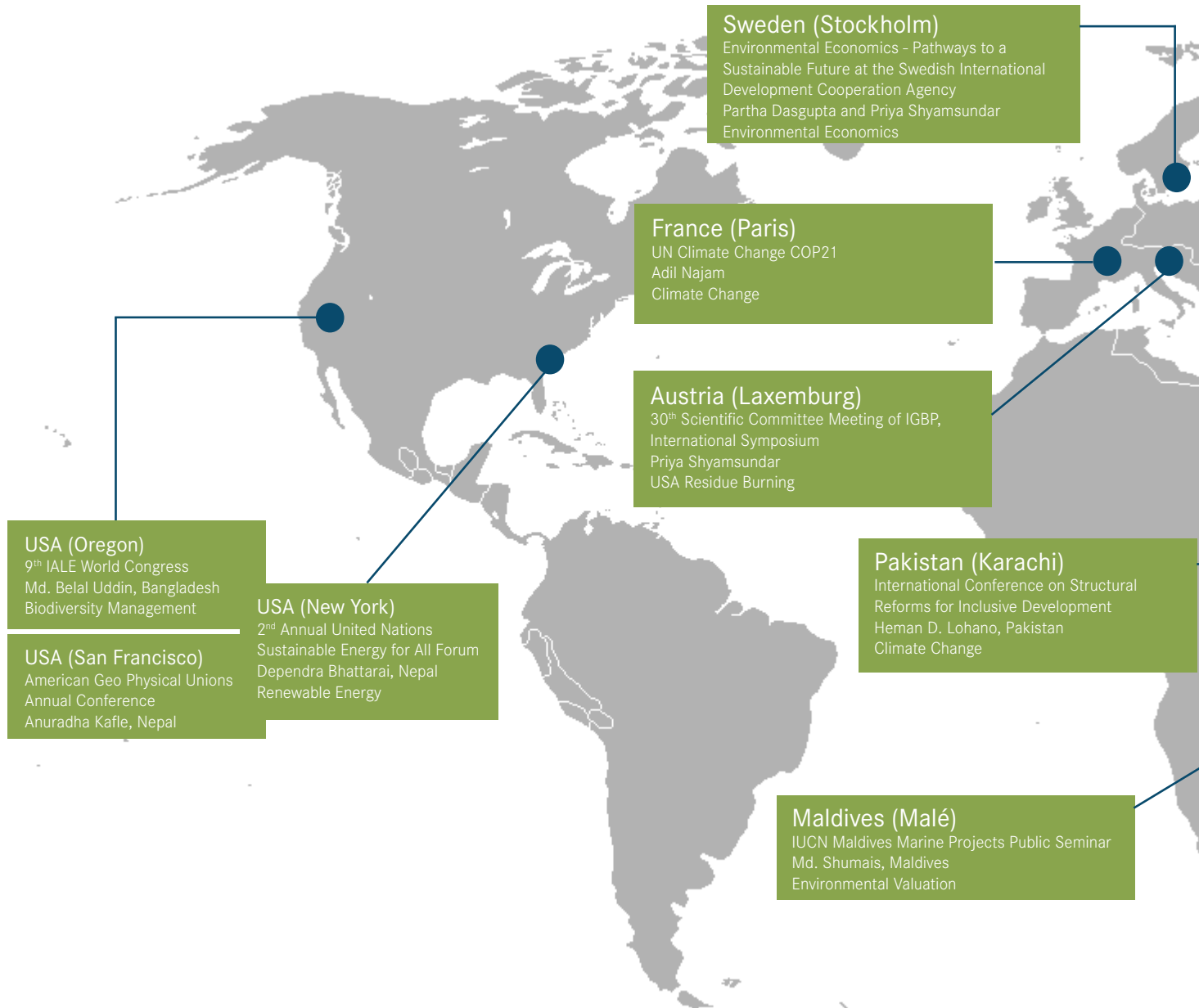
Policy solutions are forged from research, through peer review, by discussion among stakeholders, via network development, and with leadership. SANDEE shortens the distance from research to policy by navigating these elements.

In 2015, SANDEEites presented findings in some 18 conferences or seminars across the globe. SANDEE is also well represented at 19 universities in Bangladesh, India, Nepal, Pakistan and Sri Lanka, by faculty or curricula. Multiple SANDEE researchers received awards, promotions and recognition over the past year. We congratulate each one and celebrate with them all.

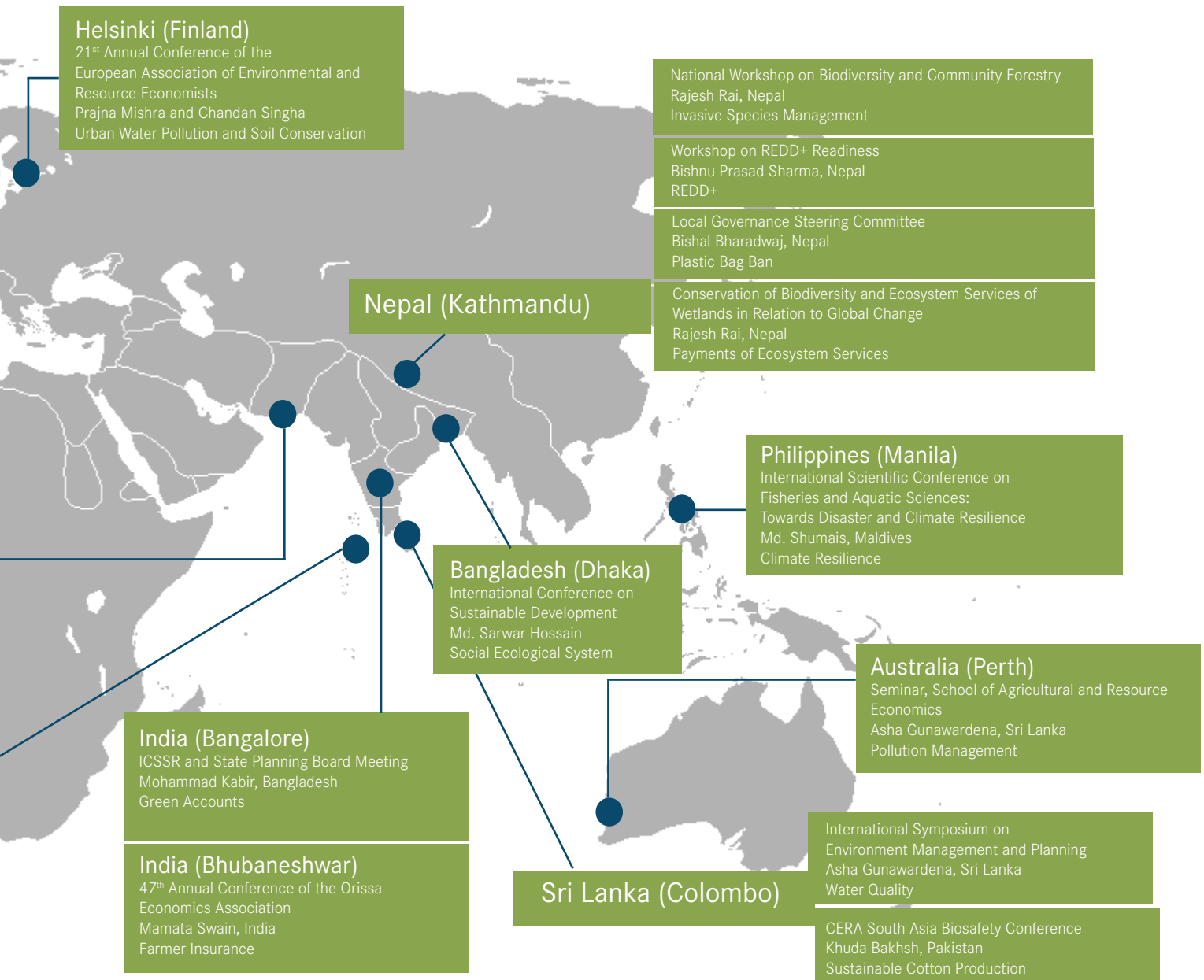
Swedish International Development Cooperation Agency's workshop: Environmental Economics – Pathways to a Sustainable Future

Economists and ecologists from around the globe gathered in Sweden in May at a SIDA workshop on strategy for sustainability. Director General Charlotte Petri Gornitzka opened the workshop. From SANDEE, Founder Board Member Sir Partha Dasgupta discussed the importance of local ecosystems and local action in addressing global problems. Priya Shyamsundar spoke specifically about SANDEE's research related to REDD+ as an example of local actions affecting global changes. Directors from the regional environmental economics networks (SANDEE, EEPSEA, CEEPA and LACEEP) and the Environment for Development Centers cited real-world environmental economic effects and discussed building the necessary capacity to address complex environmental-sustainability issues.

Conferences and Seminars, 2015



Outcome: Policy Dialogue and Implementation



PUBLICATIONS

In 2015 SANDEEites published more than in any other year, upwards of 80 knowledge products linking development and the environment in South Asia. Grantees published 23 peer-reviewed journal articles and SANDEE staff had work in 33 peer-reviewed and other publications. SANDEEites also produced 10 working papers and 14 policy briefs.

“I am grateful to the staff of SANDEE who extended untiring support in reviewing and editing various drafts of the report. Efforts and follow-ups by SANDEE enabled us to publish our working paper in Land Use Policy and made the review process relatively easy.”

-Tanvir Ahmed, Associate Professor, Forman Christian College, Pakistan

“SANDEE helped us in every stage of the publication from selection of the journal to revision of the paper. At one stage of the revision, we were looking for a climate scientist to help with long-term projection and SANDEE put us in touch with one of the best in this field.”

-Kazi Iqbal, Research Fellow, Bangladesh Institute of Development Studies

Bangladesh

Iqbal, Kazi & Roy, Paritosh K. (2015) Climate change, agriculture and migration: Evidence from Bangladesh, *Climate Change Economics*

Nepal

Pant, K. P. (2015) Uniform-price reverse auction for estimating the costs of reducing open-field burning of rice residue in Nepal, *Environmental and Resource Economics*

Rai, R. K., P. Shyamsundar, L. D. Bhatta and M. Nepal (2015) Differences in demand for watershed services: Understanding preferences through a choice experiment in the Koshi Basin of Nepal, *Ecological Economics*



Outcome: Knowledge Products

Sri Lanka

Rathnayake, M. W. R. (2015) Turtle watching: A strategy for endangered marine turtle conservation through community participation in Sri Lanka, *Ocean and Coastal Management*

Wickramasinghe, K. (2014) Determinants of receipts of environmental awards and certifications by hotels in Sri Lanka: Experience from the Western Province, *Journal of Environment Professionals Sri Lanka*

Edirisinghe, J. C. (2015) Smallholder farmers' household wealth and livelihood choices in developing countries: A Sri Lankan case study, *Economic Analysis and Policy*

Pakistan

Ahmed, T. & Ahmad, B. (2014) Burning of crop residue and its potential for electricity generation, *Pakistan Development Review*

Ahmed, T., B. Ahmad & W. Ahmad (2015) Why do farmers burn rice residue? Examining farmers' choices in Punjab, Pakistan, *Land Use Policy*

Irfan, Md. (2015) Disamenity impact of Nala Lai (open sewer) on house rent in Rawalpindi City, *Environmental Economics and Policy Studies*

Mangan, Tehmina & Lohano, Heman D. (2015) Impact of nature-based tourism on earnings of local people: Evidence from Keenjhar Lake in Pakistan, *The Pakistan Development Review*

India

Patnaik, S. & Swain, M. (2015) Crop insurance for adaptation to agricultural risk in drought-prone Kalahandi District in Odisha, *Artha Vikas: Journal of Economic Development*

Sarkhel, P. (2015) Flood risk, land use and private participation in embankment maintenance in Indian Sundarbans, *Ecological Economics*

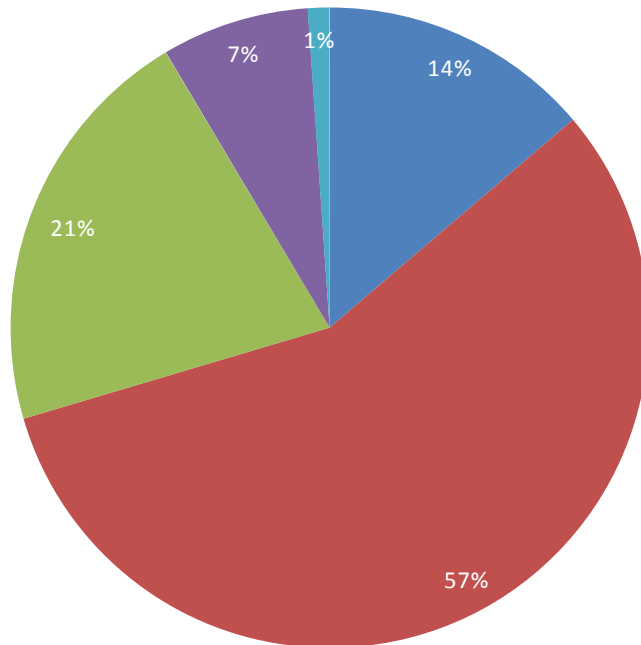
Viswanathan, B. & Kumar, K. (2015) Weather, agriculture and rural migration: Evidence from state and district level migration in India, *Environment and Development Economics*

Goswami, K. (2015) To grow or not to grow? Factors influencing the adoption of and continuation with jatropha in North East India, *Renewable Energy*

Ghosh S. (2014) Resilience of nature: Damage and recovery of Sundarban agriculture after Cyclone Aila, *Artha Beekshan*



FINANCIAL OVERVIEW AND SPONSORS



Expenditure 2015

US\$ 893,143

- Direct Secretariat Expenses
- Research Support
- Training and Institutional Support
- Policy Advocacy & Dissemination
- Other

Sponsors



OUR TEAM AND PARTNERS

PARTNERS

We would like to thank the following faculty and institutional partners for their support.

Asian Centre for Development,
Bangladesh

Cambridge University, UK

Duke University, USA

Institute of Economic Growth, India

Institute of Policy Studies, Sri Lanka

International Geosphere-Biosphere Program, Sweden

Khulna University, Bangladesh

Toulouse School of Economics, France

United Nations Environment Programme

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University of Queensland, Australia

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SANDEE's Research Advisors ensure a very high professional academic standard. They bring environmental economic skills and experience from all over the world, to provide technical support and mentoring to local SANDEE researchers.

RESEARCH ADVISORS

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Professor, Duke University, USA

E. Somanathan

Professor, Indian Statistical Institute, India
Executive Director, SANDEE

Priya Shyamsundar

Policy Director, SANDEE



The SANDEE team includes the Research Advisors, the Secretariat in Kathmandu and the Management and Advisory Committee that governs SANDEE.

MANAGEMENT ADVISORY COMMITTEE

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E. Somanathan

Executive Director, SANDEE

THE YEAR AHEAD: 2016

RESEARCH

Ongoing research on climate change, ecosystem services and greening of development policies. Collaborative research on REDD+ implementation in Nepal and the trans-boundary Kailash Landscape Valuation. Exploration of sustainable energy and urbanization activities.

TRAINING

Winter School in Research Methods, Summer School in Environment and Resource Economics.

CAPACITY BUILDING IN UNDERSERVED AREAS

Dasgupta Post-Doc Fellowship, Bangladesh Ph.D. Scholarships, Research and Writing Workshops.

DISSEMINATION AND COMMITTEE SUPPORT

Working Papers, Newsletters and Policy Briefs. Inform national policies and global discussions through TEEB India regional policy. Direct dissemination to stakeholders. Media communications and popular blogs.

PROGRAM MANAGEMENT

Staff planning and improvements in Grant Management Systems, annual reporting and communication strategies.

KEY ENVIRONMENTAL INDICATORS FOR SOUTH ASIA

	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Population (millions)	156.6	0.754	1,252.1	345	27.8	182.1	20.5
GNI per capita, Atlas method (\$)	1,010	2,330	1,570	5,600	730	1,360	3,170
GDP (\$ billions)	150.0	1.8	1,875.1	2.3	19.3	232.3	67.2
Agriculture							
Land area (1,000 sq. km)	130	38	2,973	300	143	771	63
Agricultural land (% of land area)	70	14	60	23	29	35	43
Forests and Biodiversity							
Forest area (% of land area)	11.0	85.8	23.1	3.0	25.4	2.1	29.2
Annual deforestation (% change, 2000-2011)	0.2	-0.3	-0.5	0.0	0.7	2.2	1.1
Nationally Protected Area (% of land area)	4.7	28.4	5.2	–	16.4	10.7	22.0
Energy, Emissions and Pollution							
GDP per unit of energy use (2005 PPP\$ / kg of oil equivalent)	205	359	614	970	383	482	499
Electricity generated using fossil fuel (% of total)	98.0	–	79.4	–	0.1	64.5	59.1
Electric power consumption per capita (kWh)	259	–	684	–	106	449	490
CO ₂ emissions per capita (metric tons)	0.4	0.7	1.7	3.3	0.1	0.9	0.6
Water and Sanitation							
Access to improved water sources (% of total population)	85	98	93	99	88	91	94
Access to sanitation in rural areas (% of rural population)	58	31	25	100	34	34	94
Internal freshwater resources per capita (cubic meters)	671	103,456	1,155	87	7,130	302	2,578
Total freshwater withdrawal (% of internal resources)	34.2	0.4	52.6	19.7	4.9	333.6	24.5
Under-5 mortality rate (per 1,000 live births)	41	36	53	10	40	86	10
National Accounting Aggregates							
Gross national savings (% GNI)	35.9	27.3	32.2	–	42.8	20.0	26.4
Consumption of fixed capital (% GNI)	7.0	3.6	9.9	15.4	4.9	5.0	5.5
Education expenditure (% GNI)	1.8	3.4	3.1	6.7	4.2	1.5	1.4
Energy depletion (% of GNI)	1.7	0.0	1.4	0.0	0.0	2.1	0.0
Mineral depletion (% GNI)	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Net forest depletion (% GNI)	1.0	16.6	1.2	0.0	4.2	0.8	0.4
CO ₂ damage (% GNI)	0.4	0.3	1.3	0.6	0.2	0.7	0.2
Adjusted net savings (% GNI)	26.8	9.1	19.8	–	36.4	10.2	20.8

Source: Little Green Data Book, 2015. World Bank.

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