

4. Partners, Capacity Building and Outreach

We have sustained engagement with partners in Sri Lanka and outside over the last six years to enable the broad uptake of climate information. Much of our work in this arena is informal and is vested in the understanding and goodwill of a spectrum of individuals. Here, we briefly list out partners, the particulars of the capacity building programs and summarize our formal programs of outreach.

4.1. Partners

- Summary
- Principal Partners
 - International Research Institute for Climate and Society
 - Earth Institute at Columbia University
 - Mahaweli Authority of Sri Lanka

4.2. Capacity Building

- Infrastructure
- Training
- Bibliography

4.3. Outreach

- Sri Lankan Meteorology, Oceanography and Hydrology Network
- South Asian Climate Digest
- Popular Articles

Current Status and Next Steps

Activity	Objectives	Partners	Status	Next Steps
South Asian Climate News - newsletter and website	(1) To update South Asians about climate forecasts, news and provide information on South Asia elsewhere.	Network of recipients and contributors are listed in website.	Four quarterly issues of the newsletter provided by email and postal mail. A website archive for the newsletter was developed. Compilation of 6 year archive of newsletter.	Quarterly issues will continue to be provided
Dissemination of Climate Information, Project Information	(1) Inform decision-makers of lessons of project work (2) provide useable climate information	IRI	Comprehensive Brochure on IRI's Sri Lanka Projects compiled, website for projects and for users in Sri Lanka developed, Feature articles published	Updating of website, brochure, and publication of review papers
Asia Digest: Regional Update for Asia	Provide a synopsis of current climate information and forecasts for those with interests in Asia	Jia Fang, Chet Ropelewski, Anji Seth, IRI	Six issues archived at http://iri.columbia.edu/asia/project/DigestAsia/	This project has been brought to a close.
Bibliography of Climate and Related Aspects for Sri Lanka	Produce a bibliography of references on climate and related aspects for Sri Lanka	J. Ratnayake, Univ. of Colombo, A. Somasundera, Univ. of Peradeniya, Z. Yahiya, NRMS	Bibliography was published in February 2004	Distribution.

Partners

Our principal partners have been the Mahaweli Authority of Sri Lanka (including the Natural Resources Management Services (NRMS)), the International Research Institute for Climate and Society and its umbrella organization, the Earth Institute at Columbia University. We have sustained interactions with the University of Peradeniya, Department of Meteorology and International Water Management Institute on various aspects.

Natural Resources Management Services – (NRMS)

The Natural Resources Management Services (Pvt) Ltd., (NRMS) is a Company established by the Mahaweli Authority of Sri Lanka to undertake transactions in the field of Natural Resources Management.



Photos: Mahaweli Authority Office at Polgolla and the CAPAG staff with others at NRMS in front of the Mahaweli River.

Other Sri Lankan Partners

Mahaweli Authority of Sri Lanka
Natural Resources Management
- Services
National Water Resources Authority
Department of Meteorology
University of Peradeniya
International Water Management Institute
Anti Malaria Campaign
Coconut Research Institute
Tea Research Institute
Department of Census and Statistics

International Partner Institutions

International Research Institute for
Climate and Society
The Earth Institute at Columbia University
University of North Carolina
Indian Institute of Tropical Meteorology
Indian Institute of Science
Frontier Research System for Global Change
Japan
National Aeronautical and Space Agency
USA.

IRI Background



IRI's Mission Statement and Approach

The IRI has been involved in collaborative projects on the application of climate information and forecasts in the *Mahaweli* River basin in Sri Lanka since January 2000. This work is in-line with IRI's philosophy of linking climate to societal needs. It is formulated with the approach of understanding and interaction between producers and the users of climate information.

The mission of the IRI is to enhance society's capability to understand, anticipate and manage the impacts of seasonal climate fluctuations, in order to improve human welfare and the environment, especially in developing countries. This mission is to be conducted through strategic and applied research, education and capacity building, and provision of forecast and information products, with an emphasis on practical and verifiable utility and partnerships. The IRI favours integrated efforts aimed at real-world problems involving application of climate information.

IRI has been associated with demonstration projects in Water Resources, Agriculture, Environment and Disaster Risk Management in Sri Lanka.



Photo: Neil Ward (IRI), Lareef Zubair (IRI) and Jayantha Obeysekera (South Florida Water District) meet with the Acting Director and Deputy Directors of the Sri Lanka Department of Meteorology, Colombo, Sri Lanka, March 2003.



Photo: Prof. Madduma Bandara, Chairman of National Water Resources Authority (Interim) of Sri Lanka and adviser to the Sri Lankan Minister of Irrigation and Water Resources meeting with IRI staff, November 2002

The Earth Institute Background



The Earth Institute aims to be the world's academic pioneer in mobilizing the sciences and public policy in pursuit of a sustainable future, especially for the world's poor. Under the direction of international economist Professor Jeffrey D. Sachs, the Earth Institute supports pioneering projects in the biological, engineering, social, and health sciences, while actively encouraging interdisciplinary projects in pursuit of solutions to real world problems. Some of the Earth Institute Centers are:

- Center for Environmental Research and Conservation (CERC)
- Center for Global Health and Economic Development (CGHED)
- Center for Globalization and Sustainable Development (CGSD)
- Center for International Earth Science Information Network (CIESIN)
- International Research Institute for Climate and Society (IRI)
- Center for Hazards and Risk Research (CHRR)

The Earth Institute has several programs in Sri Lanka and we have participated in these. The CGSD has been involved in country advising in 2003. IRI, CHRR and CIESIN conducted a case study on disaster risk hotspots. IRI, CIESIN and CERC conducted the project on Human Elephant Conflict. In addition, the CERC, the CGHED and Millennium Challenge Program are involved in Sri Lanka.



Photo: Nirupam Bajpai (center of CGSD), Lareef Zubair (right), and Irugal Bandara (left) stand in front of a barrage and the Mahaweli River Basin's meteorological stations at the Mahaweli River Basin Authority in Polgolla.



Photo: Prof. Jeffrey Sachs with Lareef Zubair at discussion at the Sri Lankan Prime Minister's residence in January 2003.

Mahaweli Authority Background



The Mahaweli Authority is a government body constituted in 1979 to support the accelerated use of the Mahaweli river for development. This Mahaweli Development Programme was the largest integrated rural development multi-purpose programme ever undertaken in Sri Lanka.



The objectives were to increase agricultural production, hydropower generation, employment opportunities, and settlement of landless poor and flood control. The primary task of MASL has been and remains “the improvement of human life in the Mahaweli impacted areas”. The Mahaweli Authority has several divisions under it each headed by a Director. Our work has been in relation with the Environment and Forest Conservation Division (EFCD), the River Basin Division (RB) and the Headworks Administration, Operations & Maintenance Division (HAO&M). Our work was initially hosted at the EFCD by the Natural Resources Management Services, but since 2005 we work at the premises of the (HAO&M) Division in Digana.



Map: The larger region covered by the Mahaweli River Authority.



Picture: The Victoria Reservoir is the largest reservoir in Sri Lanka. It is one of five large reservoirs constructed along the Mahaweli in recent decades.

WHOLE ISLAND

- Population: 20 million
- Area: 65,536 sq. km.
- Agricultural land: 57%
- Crops: tea, rubber, coconut, rice
- Installed hydropower capacity: 1145 MWh of total 1673 MWh

MAHAWELI AND RELATED

- Population 8 million (40%)
- Area: 40% of island
- Agricultural land: 80% of basin
- Crops: tea, rice
- Installed hydropower: 50% of total

Project Initiation Letter: Mahaweli Authority Director-General, 2000.

“I consider that this study will be of much help to us in the current and future management of the Water and Environmental Resources in the Mahaweli Basin... I look forward to a mutually beneficial relationship.”

–Mahinda Samarasekera, DG/MASL May 2000.



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500, T.B. Jayah Mawotha, Colombo 10

30th May, 2000

Mr. Antonio Divino Moura
Director General
International Research Institute
For Climate Prediction
P.O.Box: 000-61 Rt. 9W - 204 Oceanography
Palisades, NY 10964 8000
U.S.A

Dear Dr. Moura

Project Proposal: Use of Seasonal Climate Forecasts for Water and Environmental Management in the Mahaweli Basin

I thank you for your letter of Friday 12th May, 2000 on the above subject

I have gone through the Proposed Pilot Study compiled by Dr. Zubair, Project Coordinator. I consider that this study would be of much help to us in the current and future management of Water and Environment Resources conservation in the Mahaweli Basin.

We shall therefore be happy to collaborate with you in the conduct of this pilot project. Related Mahaweli agencies will liaise with you in terms of advise and provision of technical assistance, office support and any other information that the Pilot Study Team may require. The MASL encourages collaborative research with immediate practical ramifications of the type proposed by the IRI Project Team. We look forward to a mutually beneficial relationship in the future.

With Best Wishes.

Sincerely,

(Mahinda Samarasekera)
Director General

MAHAWELI AUTHORITY OF SRI LANKA

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Mahaweli Authority Project Partners' comments

Dr. H. Manthrithillake, Director, Mahaweli Authority wrote in July 2001 after his visit to the IRI:

“Thank you for inviting me to your institute and allowing me to interact with your senior research staff. I regret that I could not meet you personally. However, I had the great pleasure to know what your institution is doing in general and specifically, in relation to Mahaweli of Sri Lanka.

I was quite amazed to know the linkages between SST of Indian Ocean and the runoff of the Mahaweli River in Sri Lanka. Of course, these connections are new to me and also to my colleagues here in Sri Lanka who deal with hydrology. I believe the results of this study will have a great impact in future policy, operational planning and other water management decisions. I shall be thankful to you to keep us informed of your future findings in this regard.

I believe the great work you've begun will make an immense social and economic benefit to mankind.



Dr. Manthrithillake's Visit– July 2001

From the Director General/Mahaweli Authority

“It is very encouraging to note that you have already started a project to use seasonal climate forecasts for water and environmental management in the Mahaweli River Basin. I have already intimated Prof. C.M. Madduma Bandara to give you the fullest cooperation.”

– P.T. Senaratne, August 2002.



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Mahaweli Authority of Sri Lanka
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500, T.B. Jayah Mawatha, Colombo 10.

Our Ref : DG/08.10
21st August, 2002

Mr. Antonio Divino Moura
Director General
International Research Institute

G.
Copies to
→ Harcef
→ Reid
NOTE address + phone
to file
P.

Dear Mr. Antonio

USE OF SEASONAL CLIMATE FORECASTS FOR WATER ENVIRONMENTAL MANAGEMENT IN THE MAHAWELI BASIN

I greatly appreciate your kind sentiments on my assumption of duties as Director General, Mahaweli Authority of Sri Lanka and look forward to the resumption of the good relations, which we always enjoyed earlier.

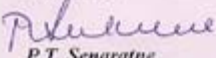
It is very encouraging to note that you have already initiated a project for Seasonal Climate Forecasts for Water and Environmental Management in Mahaweli and Walawe River Basins.

I have already intimated Prof. C.M. Madduma Bandara to give you the fullest cooperation for the success of the Project.

I look forward to your continuous cooperation and assistance. I am always available on any of the following numbers.

Residence : 853774
Office : 689653/ 689238
Cell phone : 077 711068

Hope to see you when you come to Sri Lanka.
With kind regards and best wishes.

Yours truly,

P.T. Senaratne
Director General
MAHAWELI AUTHORITY OF SRI LANKA

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Mahaweli Authority Project Partners' comments

Prof. C.M. Madduma Bandara, Chairman, International National Water Resources Authority and Natural Resources Management Services, 2003, wrote after his visit to the IRI in November 2002 to the Acting Director of the IRI, Dr. Steve Zebiak:

“ I write to thank you and the IRI staff for your kind invitation for me to visit IRI and for all what you have done to make my short stay pleasant and comfortable. I also enjoyed my visit both academically and otherwise.I should also say that the seminar was very educative, and I was so glad to learn about your Institute's capability for seasonal forecasting. This is exactly what we need in Sri Lanka and in the Mahaweli Project.

Soon after my return, I had the occasion to meet our Cabinet Minister in-charge of the subject of Irrigation and Water Management. When I reported to him the capabilities at IRI for seasonal forecasting, he instructed me to write to you straight away. So I would be thankful, if you could permit Dr. Lareef Zubair to visit the Mahaweli Authority and work out the modalities of further collaboration”



Picture: Discussion at IRI following Prof. Madduma Bandara's presentation on collaboration



Photo: L-R: Prof. Madduma Bandara, Dr. Jayantha Obeysekera, Director, Hydrological Monitoring Services, South Florida Water District, Lareef Zubair during the IRI-DWC Climate for Water Resources Management Conference.

Capacity Building

We have carried out the following activities to network, communicate and disseminate information.

- South Asian Climate News, a quarterly newsletter reaching 1500 scientists and policy makers
- Asia Climate Digest, a summary of current information for Asia.
- Seminars, lectures and training programmes
- Websites, Feature Articles
- Supported the national Steering Committee on Seasonal Climate Predictions.

Popular Writings

Articles have been published in newspapers, newsletters and in popular websites on the following topics.

- Development of Meteorology in Sri Lanka
- History of Meteorology in Sri Lanka
- Analysis of Climate Literature in Sri Lanka
- Developing Climate Predictions for Sri Lanka
- Cyclone Hazard and Response in Sri Lanka
- Climate Change and National Security
- Climate Lingo in Sri Lanka
- The Kandy Climate and its Lessons
- Climate and Power Cuts in Sri Lanka
- Internet Weather Forecasts for Sri Lanka
- Climate and Cricket in Sri Lanka
- Seasonal Climate Prediction for Sri Lanka
- FAQ on 2001 Drought in Sri Lanka



Poster Presentations

December 2002: Posters at the Inaugural Ceremony of the Workshop on Impact Assessment and Adaptation Methods of Climate Change for Plantations, organized for officials of the Ministry of Plantations and Department of Meteorology, Taj Samudra Hotel, Colombo.

February 2003: Poster Display for Minister of Water Resources and Irrigation and Minister of Science and Technology and Director and Deputies of the Department of Meteorology at the Mahaweli Authority Polgolla Offices

South Asia Climate News

We have been editing, producing and distributing the South Asia Climate News whereby scientists and policy makers are informed on a trimesterly basis. This newsletter helps share information between those working in the fields of climate and geophysics in Sri Lanka. The Network has expanded beyond Sri Lanka to include South Asia in particular. The newsletter is distributed to research libraries, institutes involved in meteorology, oceanography and hydrology and to researchers and other interested parties. The newsletter can be obtained via email at slmohn@sltnet.lk or by accessing the website: <http://www.climate.lk/>

Asian Climate Digest

Based on material compiled by the IRI climate digest team, a quarterly Asian edition of the Climate Digest was produced by Jia Fang and Lareef Zubair. This digest is available at <http://iri.columbia.edu/asia/project/DigestAsia/>

Photo: Workshop on the Climate of Sri Lanka and Climate Applications for staff of the headworks division of the Mahaweli Authority and the Central Engineering Consultancy Bureau at Digana, Sri Lanka, December 2003.

Infrastructure

We have focused on developing capacity to deliver climate services and to generate climate knowledge in a sustained manner.

We have assisted with infrastructure development for the application of climate services in a few catalytic ways. Chief among them is the development of a climate research group, the quarterly communication of developments in the climate field and the training of post-graduate students. In addition, the following have been contributions towards developing climate services.

- Lareef Zubair served as a Visiting Scientist attached to the Ministry of Science, Technology and Economic Reform in January 2002. A concept note on how climate predictions could be developed was presented to the Ministry.
- Software and Literature were provided to the Department of Meteorology
- Support was provided to the National Steering Committee on Seasonal Climate Prediction. This includes IRI predictions tailored to Sri Lanka.
- Literature on seasonal climate prediction and its application is being distributed to various libraries and research groups that are conducting relevant research.
- A campaign against a plan to handover a large part of the Colombo Meteorological Observatory to a Foreign High Commission was supported.
- Support for the establishment of a national steering committee on seasonal climate predictions and applications.



Picture: The potential and limitations of climate prediction was presented at the office of the Sri Lankan Minister of Water Resources and Irrigation in January 2003 to the Minister and his advisors.

Training

Training and Collaborative Research

We contributed to enhance personnel skills in climate research and its applications through on-the-job training, graduate training and through collaborative research.

On The Job Training

Ten staff members have been recruited for our projects. Of these four have left as of December 2005. Three were graduate civil engineers, one chemical engineer and one agricultural engineer. We also have a GIS operator, documentation specialist, web-programmer and a data entry operator. The computational infrastructure, library facilities and journal articles have been provided. Two staff members completed their Masters in Water Resources Management and Oceanography and another a B.S in Information Technology and another is enrolled towards a B.A in Social Sciences.

During a secondment to the Sri Lanka Department of Meteorology, Lareef Zubair provided a four-lecture series on current developments and conducted one on one training.

Two engineers from the Mahaweli Authority were trained for two weeks in 2005, following which the authority has now seconded one of the engineers for a year's training with us.

Post-Graduate Training

Training post-graduate and undergraduate students in Sri Lanka seems to be the surest means of introducing climate concepts into the wider scientific and engineering community. We have conducted the following lectures at Sri Lankan Universities:

- University of Colombo: M.Sc Course in Meteorology. A 30-hour graduate course on statistical analysis was presented.
- University of Peradeniya: M.Sc Course in Oceanography, Water Resources, Environmental Engineering and Disaster Management.
- University of Moratuwa: M.Sc Course in Water Resources Engineering

In addition, supervision is being provided to two students undertaking thesis research at Columbia University and two undergraduates as summer interns on the Sri Lanka projects.

Collaborative Research

Collaborative research was undertaken with Prof. T.D.M.A Samuel of the University of Peradeniya in tea cultivation and Solar Radiation and with personnel in the Mahaweli Authority. We are actively collaborating with partners in the Anti-Malaria campaign, Tea Research Institute and the Mahaweli Authority.

Bibliography of Weather and Climate

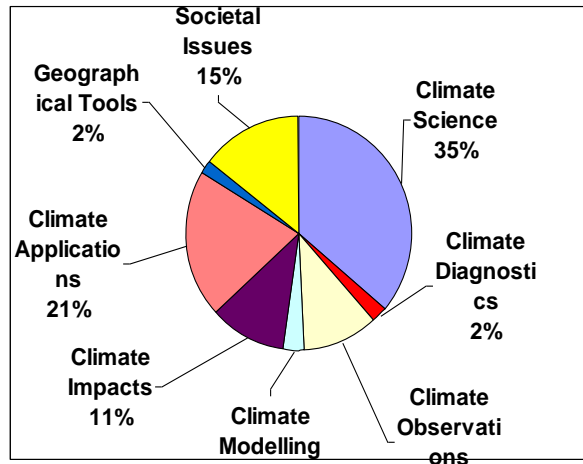
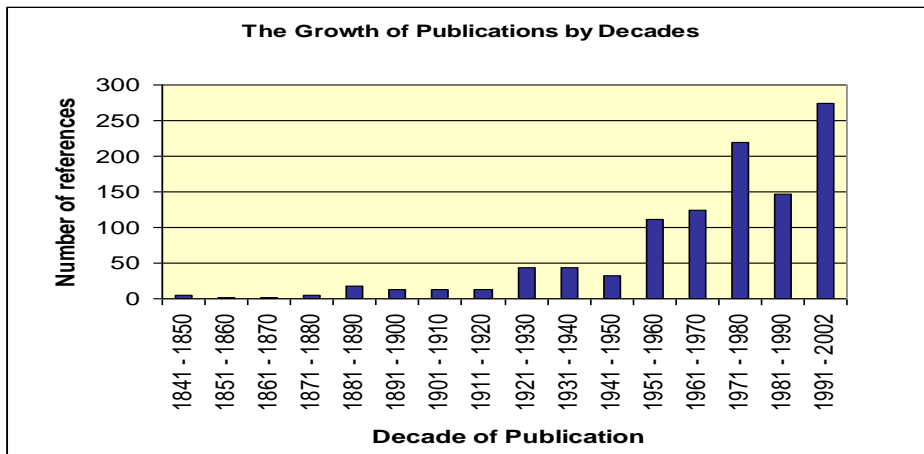


Chart: Breakdown of publications by major categories

We have produced a Reference Guide for the climate of Sri Lanka its impacts and related fields. This work was supported by the National Science Foundation, Sri Lanka and the IRI. Around 1,400 references on weather and climate and their impacts on activities such as agriculture, fisheries, water resources, energy, health and disasters are compiled here. References on the relationship between the oceans, land and water on weather and climate are included. References that are of interest from historical, archaeological and policy perspectives are included as well. The compilation in cognate fields is limited to references that have a direct bearing on weather and climate. References on South Asian and Indian Ocean that bear on Sri Lanka are included. Indices based on author, subject, keyword and geographical units are included



Graph: Growth of meteorological publications by Decades

Outreach

Our outreach is often informal. Formally we undertake several lectures, workshops, newspaper and magazine articles. We produce the South Asian Climate News regularly and distribute on behalf of the Sri Lanka Meteorology, Oceanography and Hydrology Network. This network is described below.

South Asian Climate News

Newsletter of the Sri Lanka Meteorology, Oceanography and Hydrology Network

This network and newsletter was started in late 1998 by Lareef Zubair. As pointed out in the first issue in January 1999: “At the Sri Lanka Association for the Advancement of Science (SLAAS) meeting that was held in December 1998, I had the opportunity to discuss the needs of researchers in climate and oceanography in Sri Lanka with some members who attended, and there was agreement that it would be worthwhile to maintain some sort of network. The reasons are that there is no forum in Sri Lanka that brings those with such interests together. We are often not aware of the work of one another; meetings related to climate take place without our knowledge and in many cases we do not know each other. Perhaps we shall be able to seek help from one another or even organize an annual meeting. Perhaps such a network can contribute to the development of the field. I am not sure as to what sort of network would be appropriate and sustainable. Perhaps all this can become clear once we set up a channel of communication among ourselves.”

Eight years have gone and the modest goal that we set of bringing out quarterly issues has been accomplished. The mailing goes out to over 1000 subscribers by post and email. We have been able to bring to a wider audience a number of activities affecting Sri Lanka such as the INDOEX program (2000), IPCC, meetings in Colombo, the visit of the Director-General of the Indian Meteorological Department (1999), the land takeover of the Department of Meteorology (2002), and the Sethusamudaram Project (2004) various opportunities for meetings, grants and collaboration. In time, this is a task that should be undertaken by a learned society. In addition, the coverage has been expanded to encompass the South Asian Region and the work of several institutions in the South Asian Region has been highlighted.

Our thanks are due to the subscribers and contributors but particularly to the staff members who have worked to ensure its publication, its production in a format of increasing quality and its presentation on the internet.

Outputs

Publications

July 2004: Empowering the Vulnerable, *TIEMPO*, 52:3-6, University of East Anglia, UK,

July 2004: Weather, Climate Variability and Climate Change, *Workshop Report, Synthesis Workshop on Climate Variability*, Climate Change and Health in Small-Island States, pages 13-14, World Health Organization, Bandos, Maldives.

April 2004: Towards Developing Weather and Climate Prediction for Sri Lanka, *Journal of the Institute of Engineers*, Sri Lanka, XXXVII, 2:53-58.

Sep 2003: Saving Weather Data , *TIEMPO*, University of East Anglia, UK.

May 2002: Development of Meteorology in Sri Lanka, *Journal of the Institution of Engineers*, Sri Lanka. 15(2):14-18.

February 2000: Weather and Climate of Sri Lanka and Impacts and Adaptation: A Reference Guide, Foundation for Environment, Climate and Technology, Kandy, Sri Lanka.

Presentations

October 2002: El Nino's impacts half a world away: Stories from Southern Asia, *Lamont Doherty Earth Observatory Open House*, Palisades.

July 2002: The Impact of Oceans on the Climate of Sri Lanka, *University of Peradeniya*, Sri Lanka.

April 2002: Application of Climate Information and Prediction, *Frontier Research System for Global Change*, Yokohama, Japan.

February 2002: Developing Climate Prediction for Sri Lanka, *Sri Lanka Association for the Advancement of Science*, Sri Lanka.

January 2002: Exercises in Mesoscale Climate Modelling for Sri Lanka, *Department of Meteorology, Colombo*, Sri Lanka.

January 2002: IRI and Global Databases and Internet based climate resources, *Department of Meteorology, Colombo*, Sri Lanka.

November 2001: Mahaweli Project, *Presentation to Taiwanese Delegation Visiting IRI*, Palisades.

Feature Articles

Environment

Aug 2005: Six Months On –An Editorial from the GeoLanka/RecoverLanka administrators, *The Island*, 5 August 2005.

Aug 2005: Facing risks in Sri Lanka from the Indian Canal, *Daily Mirror*, 5 August, 2005.

Aug 2005: The Tsunami, Science and Disaster Management, *The Island*, 27 January 2005.

Aug 2005: Sethusamudaram Canal: Sri Lanka and Tamil Nadu at risk, *Daily Mirror*, 1 August, 2005, *Island*, 5 October 2005.

Aug 2004: Hazards from excavating the Palk Straits for Shipping, *Daily Mirror*, 1 August 2004, *The Island*, 5 October 2004.

Nov 2003: UK High Commission, Sri Lanka Foreign Ministry and our environmental security, *the Daily Mirror*, 26 November 2003.

Jun 2003: Climate Change, National Security and the British High Commission, *The Island*, 22 June 2002, *Daily News*, 10 July 2002.

Climate

May 2004: Was the bumper rice harvest for 2002/03 Maha due to El Nino?, *Daily Mirror*, 10 May 2004.

Dec 2003: Cricket and Climate in Sri Lanka, *Daily News*, 4 December 2003.

Aug 2003: What led to the May Floods, *The Island*, 23 August 2003, *The Daily News*, 4 December 2003.

Technology

May 2004: Inducing energy conservation, *Daily Mirror*, 10 May 2004.

Apr 2002: Tips for energy conservation at home, *The Island*, 17 April 2002 and *The Daily News*, 26 April 2002, *The Daily Mirror*, 12 August, 2002.

Mar 2002: Post-mortem on energy conservation, *Daily Mirror*, 20 May 2002

May 1987: Do government institutions conserve energy? Lessons from Peradeniya and IFS, *The Island*, 3 April 2002.

Mar 2002: Post-mortem on energy conservation, *Daily Mirror*, 20 May 2002

May 1987: Future of Urea manufacturing plant in the balance, *The Island*, 5 May, 1987.