



- Making a Difference -

Scientific Capacity Building & Enhancement for Sustainable Development in Developing Countries

**Scoping Workshop in South
Asia Rapid Assessment
Project (SARAP) Result for
Designing Future Research
Agenda and Capacity
Building Requirements**

**Final Report for APN CAPaBLE Project:
CBA2006-09NSY-Raha
Project Leader: Sibaji Raha**

Other Collaborators/Collaborating Institutions:

Dr. Amir Muhammed, Pakistan
Dr. Kedar Lal Shrestha, Nepal
Dr. Palitha Nalin Wikramanayake, Sri Lanka
South Asian START Regional Committee (SASCOM)

Scoping Workshop in South Asia Rapid Assessment Project (SARAP) Result for Designing Future Research Agenda and Capacity Building Requirements

CBA2006-09NSY-Raha

Final Report submitted to APN

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Overview of project work and outcomes

Non-technical summary

The APN sponsored 'Scoping Workshop on South Asia Rapid Assessment Project's (SARAP) Results for Designing Future Research Agenda and Capacity Building Requirements' was organized during October 8 – 11, 2006 at Darjeeling Campus of Bose Institute, Kolkata, India. The workshop was attended by authors of different chapters of SA RAP book volume, South Asian Global Change researchers, members of South Asian START Committee (SASCOM), and representatives of international programme offices of Global Carbon Project (GCP) and Monsoon Asia Integrated Regional Study (MAIRS).

During the workshop, detailed discussions took place on the regional synthesis efforts of global change research in South Asia and views were exchanged between lead authors of different chapters and other workshop participants on the issues which have been identified during the synthesis efforts on capacity building relevant to South Asian region. This discussion was greatly facilitated by the expositions made by the international programme offices of GCP and MAIRS besides by other Indian global change research efforts which provided focussed perspectives of international and regional programmes for possible integration.

The workshop ended with a visit to Darjeeling Campus of Bose Institute. The workshop was elaborately covered by the local newspapers and raised awareness among local stakeholders on key issues related to global change in South Asian perspectives.

Objectives

The present project aimed to:

- Organize a Scoping Workshop in Darjeeling (India) for discussions on the key issues emerging out of the SA RAP for identification of future Global Change Research Agenda and capacity building requirements areas for South Asia.

Amount received and number years supported

The Grant awarded to this project was:

- US\$ 20,000

Work undertaken

The APN sponsored 'Scoping Workshop on South Asia Rapid Assessment Project's (SARAP) Results for Designing Future Research Agenda and Capacity Building Requirements' was organized during October 8 – 11, 2006 at Darjeeling Campus of Bose Institute, Kolkata, India.

Results

The final outcome of the workshop resulted in the adoption of the following recommendations:

1. Three major priority research themes for South Asia have been identified:
 - a. Himalaya and Indo-Gangetic Plain (HIGP) region spanning from Indus to Brahmaputra basins and include Arid, Semi Arid and flood plain zones. This covers the three MAIRS priority areas namely:

- i. Urbanization
 - ii. Semi arid zones
 - iii. Mountains
 - b. Coastal Zones
 - c. Monsoon Stability
2. The Capacity Building requirements at both institutional as well as individual levels are required in various areas of global change in the South Asia and the Inter-Intra regional collaboration should be encouraged to bring parity in the scientific capacity of the different countries of South Asia in the area of Global Change.
3. There is need for proper mechanism for Data Archival and Dissemination strategies as this has been identified as major constrain for present SARAP synthesis efforts. This needs to be developed with consultations of users and software/hardware experts. The publications should also be treated as data and need to be archived. The multi-mode data archival system with integration of other regional networks and meta-data availability could be one possible mode which needs to be explored through specialized and focused discussions.

Relevance to the APN CAPaBLE Programme and its Objectives

The organization of the workshop full filled the main aim of the CAPaBLE programme to develop and enhance scientific capacity in developing countries to improve their decision-making in target areas related to Global change capacity building activities.

The deliberation at the workshop covered the issues ranging from underlying drivers and responses to environmental change, climate change and variability, land transformation and its consequences, atmospheric composition change and air quality, alterations to hydrology and regional hydrological cycles, changes in coastal and marine environments, key vulnerabilities of human society in South Asia to global environmental change and adaptation/coping mechanisms. All these issues have direct relevance to sustainable development agenda being promoted by the APN's CAPaBLE programme.

The workshop has led to the identification of key areas of global change research where capacity building is required in the South Asian region based on the synthesis of existing global change research.

Self evaluation

The objectives of the workshop, as proposed in the project document, have been successfully achieved.

Potential for further work

The workshop provided a platform for discussions and development of several concepts into project forms and integrating them into the international programmes like Global Carbon Project and MAIRS for possible future funding.

Publications

A proceeding containing the draft SA RAP book volume was prepared and distributed. This served as the base document on which comments and suggestions

were made for further improvement. The final draft of SA RAP book volume will be published by SASCOM through a publisher with START's support.

Acknowledgments

APN is gratefully acknowledged for providing the financial resources under its CAPaBLE Programme for hosting this Scoping Workshop. The organization of the workshop has also been facilitated by the South Asian START Regional Centre (SAS RC) located at national Physical Laboratory, New Delhi which also arranged and provided accommodation and transport facilities to the participants during their transit through Delhi. The logistic support provided by the staff of Bose Institute both at Kolkata and Darjeeling has contributed immensely in the successful accomplishment of the desired objectives.

Technical Report

Abstract

A scoping workshop has been organized on the key issues emerging out of the South Asia Rapid Assessment Project (SA RAP) for identification of future Global Change Research Agenda and areas where capacity building requirements need to be focussed in future. This workshop under the APN's CAPaBLE programme has been planned as per the recommendations of SA MAIRS meeting and SASCOM meeting which took place in Colombo during the middle of July 2005. For the first time, SA RAP has synthesized all the global change research carried out in and for South Asia in a holistic manner which has led to the identification of the gaps in the current knowledge requiring capacity building.

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1.0 Introduction

A scoping workshop has been planned to be organized at the Darjeeling Campus of Bose Institute, Kolkata, India on the key issues emerging out of the SA RAP synthesis to lead the way for identification of future Global Change Research Agenda and the areas where capacity building requirements need to be focussed in future in South Asian region. This workshop has been planned as per the recommendations of SA MAIRS meeting and SASCOM meeting which took place in Colombo during the middle of July 2005.

For the first time, SA RAP has been trying to synthesize all the global change research carried out in and for South Asian region in a holistic manner to identify gaps in the current knowledge. The workshop was participated by lead authors of various chapters of SA RAP book volume, regional global change researchers, international experts, and SASCOM members.

The SA RAP synthesis efforts included all the components of physical and human dimensions of change in Earth system (viz. Climate, Ecosystem, atmosphere, resources and sustainable development). The overall scope of the synthesis under SA RAP are given below under different chapter headings:

- (i) Introduction: Global Environmental Changes in South Asia: A regional perspective
- (ii) Underlying Drivers and responses to environmental change
 - a. Key Drivers: Supply Side and demand
 - b. Population Demographics and Urbanization
 - c. Energy
 - d. Industrial Transformation, Technological Change and Innovation
 - e. Public Transportation
 - f. Globalization and Trade
 - g. Development Pathways
 - h. Gaps and Research Needs
- (iii) Climate Change and Variability
 - a. Past Changes (Holocene and pre-Holocene)
 - b. Recent Changes (Instrumental records-based)
 - c. Tropical Cyclones, Storm Surges and Extreme Events
 - d. Modeling
 - e. Gaps and Research Needs
- (iv) Land Transformation and its Consequences
 - a. Forest Biomass and Carbon Estimates
 - b. Soil Carbon
 - c. The Indo-Gangetic Plains
 - d. Mountains
 - e. Urbanization and Urban Heat Islands
 - f. Gaps and Research Needs
- (v) Atmospheric Composition Change and Air Quality
 - a. Natural and Anthropogenic Aerosols, Sources and Sinks
 - b. Direct and Indirect Radiative Forcing by aerosols
 - c. GHGs, Sources and sinks
 - d. Transport of Aerosols
 - e. Stratospheric-Tropospheric Exchange
 - f. Ozone and Precursor Gases
 - g. INDOEX and ABC
 - h. Air Quality
 - i. Acid rain
 - j. Gaps and Research Needs
- (vi) Alterations to Hydrology and Regional Hydrological Cycles
 - a. Monsoon Variability and Sediment Transport by Rivers
 - b. ENSO and Stream Flows in the greater GBM Basins
 - c. Floods and Droughts, including forecasting
 - d. Water Quality
 - e. Snow and Glaciers
 - f. Ground Water
 - g. Diversions and Storage
 - h. Climate Change and Future Water Availability
 - i. Impacts of Land Surface Changes on Hydrology
 - j. Gaps and Research Needs
- (vii) Changes in Coastal and Marine Environments
 - a. Biogeochemistry (Indian coast, Northern Indian Ocean)

- b. Air-Sea Fluxes
- c. Land-Sea Interactions and Material Fluxes
- d. Deltas
- e. Sunderbans, including coastal resource use
- f. Mangroves, Corals, Sea Grasses, etc., including resource use
- g. Impacts of Sea Level Rise, Changes in SST
- h. Gaps and Research Needs

(viii) Key Vulnerabilities of human society in South Asia to Global Environmental Change and Adaptation/Coping Mechanisms

- a. Climate Change Scenarios and Implications
- b. Impacts of Climate Variability/Change on agriculture
- c. Health Effects: Heat Stress, Respiratory Diseases, Water-borne Diseases, Malaria, UV-B, etc.
- d. Water Resources
- e. Mountain Regions
- f. Biodiversity, Ecosystem Changes and Goods and Services
- g. Tools for vulnerability assessment
- h. Economic Valuation of Welfare Loss
- i. Gaps and Research Needs

(ix) Conclusions including Cross-Cutting Issues and Way Forward

During the workshop, detailed discussions took place on the regional synthesis efforts of global change research in South Asia and views were exchanged between lead authors of different chapters and other workshop participants on the issues which have been identified during the synthesis efforts on capacity building relevant for South Asian region. This discussion was greatly facilitated by the expositions made by the international programme offices of GCP and MAIRS besides by other regional (including those supported by APN) and Indian global change research efforts which provided focussed perspectives of international and regional programmes for possible integration.

The final outcome of the workshop resulted in the adoption of the following recommendations:

4. Three major priority research themes for South Asia have been identified:
 - a. Himalaya and Indo-Gangetic Plain (HIGP) region spanning from Indus to Brahmaputra basins and include Arid, Semi Arid and flood plain zones. This covers the three MAIRS priority areas namely:
 - i. Urbanization
 - ii. Semi arid zones
 - iii. Mountains
 - b. Coastal Zones
 - c. Monsoon Stability
5. The Capacity Building requirements at both institutional as well as individual levels are required in various areas of global change in the South Asia and the Inter-Intra regional collaboration should be encouraged to bring parity in the scientific capacity of the different countries of South Asia in the area of Global Change.
6. There is need for proper mechanism for Data Archival and Dissemination strategies as this has been identified as major constrain for present SARAP synthesis efforts. This needs to be developed with consultations of users and software/hardware experts. The publications should also be treated as data and need to be archived. The multi-mode data archival system with integration of other regional networks and meta-data availability could be

one possible mode which needs to be explored through specialized and focused discussions.

The workshop was elaborately covered by the local newspapers and has helped in raising awareness among local stakeholders on key issues related to Global Change in South Asian Perspectives.

2.0 Conference Outputs

1. A proceeding containing the draft SA RAP book volume was prepared and distributed. This served as the base document on which comments and suggestions were made for further improvement. The final draft of SA RAP book volume will be published by SASCOM through a publisher with START's support.

2. The workshop has raised the awareness in the region on the global change issues and sensitized the stakeholders.

3.0 APN-Funded Participants

The workshop was organized primarily by the financial support made available by the APN under its CAPaBLE Programme. The APN funds were utilized to provide local hospitality to all the participants but the travel support was provided to the following participants only. Other participants (included in the list of participants in the appendix) were provided travel support by other organizations/ institutions as per the details provided in the section entitled 'Funding sources outside the APN' in the Appendix.

List of APN Supported Participants:

S.No.	Name	Address
1	Dr. A. P. Mitra, FRS	Honorary Scientist of Eminence National Physical Laboratory Dr. K. S. Krishnan Marg New Delhi - 110012, INDIA Phone : +91-11-25745298 / +91-11-25731792 Fax : +91-11-25726938 Email : apmitra@mail.nplindia.ernet.in apmitra@ernet.in apmitra@ndf.vsnl.net.in
2	Dr. J. Ratnasiri	c/o National Science Foundation 47/5 Vidya Mawatha Colombo 00700 Sri Lanka Tel: +94-11-286 3597 Fax: +94-11-269 1681 Mobile: 94-777-259 616 Email: jratna@itmin.com
3	Dr. D.A. Quadir	Chief Scientific Officer Bangladesh Space Research and Remote Sensing Organisation (SPARRSO) Dhaka, Bangladesh Email: dquadir@yahoo.com
4	Dr. S.N. de Sousa	Central Pollution Board, Goa, INDIA Ph: 0832- 2438550 Email: simaodesousa@yahoo.com

5	Prof. A Jayaraman	Space and Atmospheric Sciences Division Physical Research Laboratory Ahmedabad 380 009, INDIA Tel(O): +91 79 2631 4658 Tel(H): +91 79 2675 4803 Fax(O): +91 79 2630 1502 E mail: jraman@prl.res.in
6	Dr. Munir Sheikh	GCISC, Islamabad, Pakistan Email: munir.sheikh@gcisc.org.pk
7	Dr. K L Shrestha	President Institute for Development and Innovation 21/85 Pimbahal, Lalitpur, NEPAL Tel: 977-1-5533028, 5537059 Email: klshrestha@wlink.com.np
8	Dr. M L Shrestha	Director General Permanent Representative of Nepal with WMO Department of Hydrology and Meteorology P.O.Box 406, Kathmandu, NEPAL Tel: 977-1-4262411,4262374 Fax: 977-1-4262348 E-mail: madanls@hotmail.com dg@dhm.gov.com
9	Dr. Palitha Nalin Wikramanayake	85/7E, 13, Senanayake Mawatha, Nawala, Sri Lanka Dept. of Civil Engineering, Open University of Sri Lanka, Nawala, Nugegoda Email: tomwiks@yahoo.com
10	Dr. S D Attri	Director Environmental Monitoring and Research Centre India Meteorological Department Lodi Road, New Delhi - 110003. Ph. : 91-11-24620701, Fax : 91-11-24699216, 24623220 Email : sdattri@yahoo.com
11	Dr. V Joshi	G.B. Pant Institute of Himalayan Environment and Development P.Box. 24, PO Gangtok Sikkim 737101 India Tel:+91-3592-237189 (Extn:204), 237328 ,Fax: +91-3592-237415 09434629995 (M) Email: varunj63@yahoo.com , vjoshi1963@hotmail.com
12	Dr.Sumana Bhattacharya	Expert Consultant NATCOM Project Management Cell Ministry of Environment & Forests Address: Winrock International India S 212, IInd Floor, Panchsheel Park New Delhi 110017, INDIA Telefax: 91-11-26013876

Email: sumana@winrockindia.org

13	Dr. C Sharma	Expert Consultant NATCOM Project Management Cell Ministry of Environment & Forests
		Address: Winrock International India S 212, IInd Floor, Panchsheel Park New Delhi 110017, INDIA Telefax: 91-11-26013876 Email: chhemendra@winrockindia.org
14	Dr. G Beig	Scientist-E Indian Institute of Tropical Meteorology Dr. Homi Bhabha Road, Pashan PUNE-411008, INDIA e-mail: beig@tropmet.res.in Phone: +91-20-25893600 (x 261) Fax: +91-20-25893825

Based on the feedback received from the participants during the workshop, it can be concluded that the workshop has been very successful in providing a platform for meaningful interactions and networking on global change issues which is also evident from the consensus on key areas for priorities in global change research in South Asia. The participants also explored the possibilities of development of various research proposals focussing on the identified areas for global change research utilizing the networking opportunities provided by the workshop for submission to appropriate international and national funding agencies.

4.0 Conclusions

The APN sponsored Scoping Workshop has been greatly successful in achieving its stated objectives and has contributed to the global change research in South Asia by providing a vibrant platform for interaction among the global change research community of South Asia. The workshop deliberations have led to identification of key capacity building issues in global change research in South Asia.

Appendix

|| Agenda of the workshop ||

APN – CAPaBLE

Scoping Workshop on South Asia Rapid Assessment Project's (SARAP) Results
for
Designing Future Research Agenda and Capacity Building Requirements
October 8 – 11, 2006
Bose Institute – Darjeeling Campus
West Bengal, INDIA

October 8, 2006: Inaugural Session

1800-1830	Registration with Tea/Coffee
1830-2000	Welcome
	[S Raha]
	Remarks – by SASCOM Group
	[Janak Ratnasiri and K L Shrestha]
	MAIRS Overview – F W T Penning de Vries (MAIRS IPO)
	Global Environmental Changes in South Asia: A regional perspective
	[A P Mitra]
2000-2200	Reception Dinner

October 9, 2006: SA RAP Synthesis

Chair: A P Mitra

0930-1000	Underlying Drivers and Responses to Environmental Change
	[Joyashree Roy, C Sharma]
1000-1030	Climate Change and Variability
	[D Quadir, M Sheikh]
1030-1100	Land Transformation and its Consequences
	[V K Dadhwal]
1100-1130	Tea/Coffee
1130-1200	Atmospheric Composition Change and Air Quality
	[A Jayaraman]
1200-1300	Discussions
1300-1430	Lunch

Chair: Ai Likun

1430-1500	Alterations to Hydrology and Regional Hydrological Cycles
	[M L Shrestha]
1500-1530	Changes in Coastal and Marine Environments
	[Simon deSousa]
1530-1600	Tea/Coffee
1600-1630	Key Vulnerabilities of human society in South Asia to Global Environmental Change and Adaptation/Coping Mechanisms
	[Sumana Bhattacharya]
1630-1730	Discussions

1930-2100	Dinner
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October 10, 2006: Inputs of Other Regional Projects

Chair: F W T Penning de Vries

0930-1000	Key Issues emerging out of APN Coastal Zone Project [Janaka Ratnasiri / Nalin Wikramanayake]
1000-1030	Key Issues emerging out of APN Mountain Project [K L Shrestha]
1030-1100	Key Issues emerging out of APN Water Resources Project [Amir Muhammed, C Sharma]
1100-1130	Tea/Coffee
1130-1200	Key Issues emerging out of APN Health Project [C Sharma]

New Regional Initiatives

Chair: A.P. Mitra

1200-1230	MAIRS [F W T Penning de Vries]
1230-1300	Proposal on Monsoon Stability to IGBP [G Beig]
1300-1330	High Mountain Research in SA [V Joshi]
1330-1430	Lunch

Chair: J. Ratnasiri

1430-1500	EMRC Program of IMD [S Attri]
1500-1530	Global Carbon Project and available opportunities for South Asia [S Dhakal]

Chair: K.L. Shrestha

1530-1600	Tea/Coffee
1600-1630	Indo-Gangetic Plains Research Initiatives in SA [S C Garg, V K Dadhwal]
1630-1700	Coastal Area Research Initiative in SA [Nalin Wikramanayake]
1700-1830	Discussions on Integration of SA Research Initiatives with MAIRS Issues [Moderators: A P Mitra & de Vries]
1930-2100	Dinner

October 11, 2006: Refinement and Workshop recommendations

Chair: S. Raha

900-930	Research Facilities at Darjeeling Campus of Bose Institute [S Raha]
930-1100	Refinement of SA RAP Synthesis
1100-1130	Tea/Coffee
1130-1330	Concluding Session – Workshop Recommendations
1330-1430	Lunch

1430-1730	Lab/Field Visit
1930-2100	Dinner

|| **List of Participants** ||

**APN – CAPaBLE Scoping Workshop on South Asia Rapid Assessment Project's (SA RAP) Results for Designing Future Research Agenda and Capacity Building Requirements
October 8 – 11, 2006
Bose Institute – Darjeeling Campus**

S.No.	Name	Address
1	Dr. A. P. Mitra, FRS	Honorary Scientist of Eminence National Physical Laboratory Dr. K. S. Krishnan Marg New Delhi - 110012, INDIA Phone : +91-11-25745298 / +91-11-25731792 Fax : +91-11-25726938 Email : apmitra@mail.nplindia.ernet.in apmitra@ernet.in apmitra@ndf.vsnl.net.in
2	Dr. J. Ratnasiri	c/o National Science Foundation 47/5 Vidya Mawatha Colombo 00700 Sri Lanka Tel: +94-11-286 3597 Fax: +94-11-269 1681 Mobile: 94-777-259 616 Email: jratna@itmin.com
3	Dr. D.A. Quadir	<u>Chief Scientific Officer</u> <u>Bangladesh Space Research and Remote Sensing Organisation (SPARRSO)</u> <u>Dhaka, Bangladesh</u> Email: dquadir@yahoo.com
4	Dr. S.N. de Sousa	Central Pollution Board, Goa, INDIA Ph: 0832- 2438550 Email: simaodesousa@yahoo.com
5	Prof. A Jayaraman	Space and Atmospheric Sciences Division Physical Research Laboratory Ahmedabad 380 009, INDIA Tel(O): +91 79 2631 4658 Tel(H): +91 79 2675 4803 Fax(O): +91 79 2630 1502 E mail: jraman@prl.res.in
6	Dr. Munir Sheikh	GCISC, Islamabad, Pakistan Email: munir.sheikh@gcisc.org.pk
7	Dr. K L Shrestha	President Institute for Development and Innovation 21/85 Pimbahal, Lalitpur, NEPAL Tel: 977-1-5533028, 5537059 Email: klshrestha@wlink.com.np
8	Dr. M L Shrestha	Director General Permanent Representative of Nepal with WMO

Department of Hydrology and Meteorology
P.O.Box 406, Kathmandu, NEPAL
Tel: 977-1-4262411,4262374
Fax: 977-1-4262348
E-mail: madanls@hotmail.com
dg@dhm.gov.com

9	Dr. Palitha Wikramanayake	Nalin	85/7E, 13, Senanayake Mawatha, Nawala, Sri Lanka
			Dept. of Civil Engineering, Open University of Sri Lanka, Nawala, Nugegoda Email: tomwiks@yahoo.com
10	Dr. Frits Penning de Vries		Executive Director International Project Office (IPO) Monsoon Asia Integrated Regional Study MAIRS) Institute of Atmospheric Physics (IAP) Chinese Academy of Sciences (CAS) Qijiahuozi Huayanli 40 PO Box 9804, Beijing, 100029 PR China tel +86-10-62019536 fax +86-10-62036133 Email: fritspdv@mairs-essp.org
11	Dr. Ai Likun		Deputy officer International Project Office (IPO) Monsoon Asia Integrated Regional Study (MAIRS), Institute of Atmospheric Physics(IAP), Chinese Academy of Sciences(CAS), Qijiahuozi Huayanli 40#, P.O.Box 9804, Beijing 100029,China Tel:86-10-62040679 Fax:86-10-62036133 <u>E-mail:aili@mairs-essp.org .or. aili@tea.ac.cn</u>
12	Dr. V. K. Dadhwal		Dean, IIRS No. 4, Kalidas Road Dehradun , INDIA, PIN -248001 Ph : (+91)0135-2744583 Fax : (+91)0135-2741987 Email: dean@iirs.gov.in ; dadhwalvk@hotmail.com
13	Dr. S. Dhakal		Executive Director Global Carbon Project - Tsukuba International Office c/o National Institute for Environmental Studies 16-2 Onogawa, Tsukuba, Japan 305 8506 Tel: +81 29 850 2672, Fax: +81 29 850 2960 E-mail: shobhakar.dhakal@nies.go.jp
14	Dr. S C Garg		Emeritus Scientist

		Dr. K. S. Krishnan Marg New Delhi - 110012, INDIA Email: scgarg@mail.nplindia.ernet.in
15	Dr. S D Attri	Director Environmental Monitoring and Research Centre India Meteorological Department Lodi Road, New Delhi - 110003. Ph. : 91-11-24620701, Fax : 91-11-24699216, 24623220 Email : sdattri@yahoo.com
16	Dr. V Joshi	G.B. Pant Institute of Himalayan Environment and Development P.Box. 24, PO Gangtok Sikkim 737101 India Tel:+91-3592-237189 (Extn:204), 237328 ,Fax: +91-3592-237415 09434629995 (M) Email: varunj63@yahoo.com , vjoshi1963@hotmail.com
17	Prof. S Raha	Director, BOSE INSTITUTE P-1/12 C.I.T. SCHEME, VII-M, KANKURGACHI KOLKATA-700 054. INDIA Email: sibaji@bosemain.boseinst.ac.in
18	Dr. Sumana Bhattacharya	Expert Consultant NATCOM Project Management Cell Ministry of Environment & Forests Address: Winrock International India S 212, IInd Floor, Panchsheel Park New Delhi 110017, INDIA Telefax: 91-11-26013876 Email: sumana@winrockindia.org
19	Dr. C Sharma	Expert Consultant NATCOM Project Management Cell Ministry of Environment & Forests Address: Winrock International India S 212, IInd Floor, Panchsheel Park New Delhi 110017, INDIA Telefax: 91-11-26013876 Email: chhemendra@winrockindia.org
20	Dr. G Beig	Scientist-E Indian Institute of Tropical Meteorology Dr. Homi Bhabha Road, Pashan PUNE-411008, INDIA e-mail: beig@tropmet.res.in Phone: +91-20-25893600 (x 261)

Fax: +91-20-25893825

21	Mr. R K Bhasin	National Physical Laboratory Dr. K. S. Krishnan Marg New Delhi - 110012, INDIA Phone : +91-11-25745298 / +91-11-25731792 Fax : +91-11-25726938 Email : apmitra@mail.nplindia.ernet.in
22	Mr. A Adak	BOSE INSTITUTE P-1/12 C.I.T. SCHEME, VII-M, KANKURGACHI KOLKATA-700 054. INDIA Email: adak_bi@yahoo.com
23	Mr. A Chatterji	BOSE INSTITUTE P-1/12 C.I.T. SCHEME, VII-M, KANKURGACHI KOLKATA-700 054. INDIA
24	Mr. Soumendra Singh	BOSE INSTITUTE P-1/12 C.I.T. SCHEME, VII-M, KANKURGACHI KOLKATA-700 054. INDIA
25	Mr. T K Ghorui	Registrar, BOSE INSTITUTE P-1/12 C.I.T. SCHEME, VII-M, KANKURGACHI KOLKATA-700 054. INDIA Email: tkg8284@bic.boseinst.ernet.in
26	Mr. Deo Kumar Roy	Center for Astroparticle Physics and Space Science Bose Institute (Darjeeling Campus) 16, A J C Bose Road Darjeeling - 734101, INDIA
27	Ms. Y Yadav	Center for Astroparticle Physics and Space Science Bose Institute (Darjeeling Campus) 16, A J C Bose Road Darjeeling - 734101, INDIA
28	Dr. A K Singh	Center for Astroparticle Physics and Space Science Bose Institute (Darjeeling Campus) 16, A J C Bose Road Darjeeling - 734101, INDIA, Email: aks1208@yahoo.com
29	Dr. M K Srivastava	Center for Astroparticle Physics and Space Science Bose Institute (Darjeeling Campus) 16, A J C Bose Road Darjeeling - 734101, INDIA, Email: mksriv@gmail.com

Funding sources outside the APN

Bose Institute provided the financial support for travel to its researchers of Kolkata Campus for their participation in Darjeeling Workshop.

The South Asian START Regional Centre (SAS RC) located at National Physical Laboratory, New Delhi, India provided the accommodation and transport to some of the workshop participants at Delhi during their transit.

The MAIRS Programme Office borne the air travel costs of the Dr. Frits Penning de Vries and Dr. Ai Likun.

The Global Carbon Project Office borne the travel cost of Dr S. Dhakal.

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Minutes of the Meeting

The APN sponsored 'Scoping Workshop on South Asia Rapid Assessment Project's (SARAP) Results for Designing Future Research Agenda and Capacity Building Requirements' started in the evening of 8th October 2006 itself after all the delegates reached Darjeeling in the afternoon on the same day. During the inaugural session, Prof. Sibaji Raha, Director, Bose Institute welcomed all the delegates which was followed by remarks of Dr K.L. Shrestha and Dr Janaka Ratnasiri on behalf of the SASCOM.

The two main presentations during the inaugural session was made by Dr F.W.T. Penning de Vries who provided an overview of MAIRS and Dr A.P. Mitra who covered the regional perspective of global environmental change in South Asia. The inaugural session was followed by reception dinner.

The proceedings of the next day of the workshop was devoted to the issues related to different chapters of the South Asia Rapid Assessment Project book volume, the draft version of which was provided to the workshop participants as workshop material. The lead authors of different chapters, who were present (namely Dr. A. Jayaraman, Dr. Simon de Sousa & Dr. S. Bhattacharya) made presentations of salient features of their respective chapters and brought out the issues which need attention for building capacity in South Asian region. The lead authors, who could not participate (namely Dr. J. Roy & Dr. A. Singhvi), provided their inputs on these issues which were put on the floor for discussions and consideration. The issues related to 'Land Transformation' were covered by Dr. V. K. Dadhwal and 'Hydrological cycle' by Dr M.L. Shrestha.

The forenoon session on the following day was devoted to capacity building issues which have emerged out so far from other APN sponsored project like coastal zones, mountain, water and human health which have been carried out/being carried out in the region so far. The lead for discussions on these issues was taken by Dr J. Ratnasiri/Dr Nalin Wikramanayake, Dr. K.L. Shrestha, and Dr. C. Sharma respectively.

From the post tea session, the workshop took stock of new regional initiatives which are being taken in the region. For this purpose, Dr. de Vries first made elaborate presentation on MAIRS activities, which was followed by presentations by Dr. G. Beig on 'Proposal on Monsoon Stability to IGBP'; Dr V. Joshi on 'High Mountain Research in South Asia'; by Dr. S. Attri on 'EMRC Programme of IMD'; by Dr. S. Dhakal on 'Global Carbon Project and available opportunities for South Asia'; by Dr. S.C. Garg and Dr. V.K. Dadhwal on 'Indo-Gangetic Plains Research Initiatives in South Asia'; and by Dr. Nalin Wikramanayake on 'Coastal Area Research Initiatives in South Asia'. The evening session, moderated by Dr. A.P. Mitra and Dr. de Vries, was devoted to the discussions on the 'integration of South Asian research Initiatives with MAIRS Issues'.

The forenoon session on the last day of the workshop was initiated with the presentation of Prof. Raha on Bose Institute and available opportunities for collaborative research programmes at its Darjeeling Campus. This was followed by discussions on the requirement of refinement in the SARAP synthesis which is as

follows:

S.No.	SA-RAP Chapter	Suggestions/ Action Item
1	Introduction: Global Environmental Changes in South Asia: A regional perspective (Dr. A.P. Mitra)	<ul style="list-style-type: none"> To include 'Upper atmosphere'
2	Underlying Drivers and responses to environmental change (Joyashree Roy et al)	<ul style="list-style-type: none"> Correction of flow diagram Inclusion of environmental costs Inclusion of Composite Indicators Socio-economic hotspots vis-à-vis climate hotspots
3	Climate Change and Variability (Singhvi et al)	<ul style="list-style-type: none"> Dr Sheikh to provide refined write-up on Pakistan studies
4	Land Transformation and its Consequences	<ul style="list-style-type: none"> Dr Dadhwal to lead Draft version by Dec End Dr Shrestha to provide inputs on Himalayan area Other contributing authors are to be identified/recommended
5	Atmospheric Composition Change and Air Quality (Jayaraman et al)	<ul style="list-style-type: none"> Inclusion of new diagram presented during meeting Sumana to provide input about GHGs
6	Alterations to Hydrology and Regional Hydrological Cycles (Mirza et al)	<ul style="list-style-type: none"> Check about Pakistan data (Page 3 para 3) Author list issue – refined version will be provided by Dr Sheikh Check IMD model description Inclusion of Box on Glaciers & deposition of aerosols – check with Dr Hasnain / M.L. Shrestha As in coastal region – Nalin to refine Moti's paper on water quality Paper need to be synthesized as per Colombo decision
7	Changes in Coastal and Marine Environments (de Sousa et al)	<ul style="list-style-type: none"> Nalin to provide inputs for land-coast interaction based on outputs of Basins Workshop References to be put in combined Dr Nalin to include Dr K/P Sharma's work in his inputs include him as co-author Workout some section to capture fishery – de Susa and Nalin to formulate idea

8	Key Vulnerabilities of human society in South Asia to Global Environmental Change and Adaptation/Coping Mechanisms (Sumana, Shrestha, and et al)	<ul style="list-style-type: none"> • Inputs from Dr Ratnasiri and Dr Shrestha • Inclusion of vulnerability in health sector (heat stresses and malaria – pulmonary to remain in Chapter 5) • Dr Quadir to provide inputs on malaria etc for BD • Dr Ratnasiri for SL inputs • Nepal – check NC of Nepal for malaria data • Dr Quadir to provide Box on El Nino and Cholera
9	9. Conclusions including Cross-Cutting Issues and Way Forward (To be distilled from each chapter; Mitra et. Al.)	<ul style="list-style-type: none"> • Synthesis of all the chapter • Inclusion of capacity building requirements (both institutional and individual) • Inclusion of constraints – data needs etc.

Finally the workshop participants adopted the following recommendations:

7. Three major priority research themes for South Asia have been identified:
 - a. Himalaya and Indo-Gangetic Plain (HIGP) region spanning from Indus to Brahamputra basins and include Arid, Semi Arid and flood plain zones. This covers the three MAIRS priority areas namely:
 - i. Urbanization
 - ii. Semi arid zones
 - iii. Mountains
 - b. Coastal Zones
 - c. Monsoon Stability
8. The Capacity Building requirements at both institutional as well as individual levels are required in various areas of global change in the South Asia and the Inter-Intra regional collaboration should be encouraged to bring parity in the scientific capacity of the different countries of South Asia in the area of Global Change.
9. There is need for proper mechanism for Data Archival and Dissemination strategies as this has been identified as major constrain for present SARAP synthesis efforts. This needs to be developed with consultations of users and software/hardware experts. The publications should also be treated as data and need to be archived. The multi-mode data archival system with integration of other regional networks and meta-data availability could be one possible mode which needs to be explored through specialized and focused discussions.

The workshop ended with a visit to Darjeeling Campus of Bose Institute. The workshop was elaborately covered by the local newspaper and raised awareness among local stakeholders on key issues related to Global Change in South Asian Perspectives.