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United States Agency for International Development
Greenhouse Gas Pollution Prevention Project
Climate Change Supplement
(GEP – CCS)

Fostering Climate Change Initiative for Sustainable Development

Task 1A

Training Needs Assessment Report for LBSNAA

By:

The Louis Berger Group, Inc.

USA: 1819 H Street, Suite 900
Washington, DC 2006
India : C – 6/7, Safdarjung Development Area
New Delhi 110 016

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THE Louis Berger Group, INC.
2300 N Street, NW
Washington, DC 20037 USA

The Louis Berger Group, Inc.
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Sandeep Tandon, CTO

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LIST OF ACRONYMS

GOI	Government of India
GEP-CCS	Greenhouse Gas Pollution Prevention Program-Climate Change Supplement
IAS	Indian Administrative Service
IIPA	Indian Institute of Public Administration
ISP	Internet Service Provider
IT	Information Technology
LBG	Louis Berger Group, Inc.
LBSNAA	Lal Bahadur Shastri National Academy of Administration
NGO	Non-Governmental Organizations
NICTU	National Informatics Center
NSDART	National Society for Promotion of Development Administration, Research and Training
OT	Officer Trainee
TNA	Training Needs Assessment
T-t-T	Train-the-Trainer
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

The USAID/India Mission's activities in energy and industry focus on the promotion of clean energy development, efficient energy use, and pollution reduction in key industries and municipalities. USAID seeks to strengthen the incentives and institutional capacity of key Indian stakeholders for the adoption of clean energy technology practices and certified environmental management systems that are climate-friendly, thereby reducing greenhouse gas emissions (GHG).

The Lal Bahadur Shastri National Academy of Administration (LBSNAA, hereafter known as the "Academy") is the premier training institution for the Indian Administrative Service (IAS). The Academy trains new IAS officers through its Foundation and Professional Course. The Academy also provides in-service training courses for middle to senior ranking members of the IAS and for officers promoted to the IAS from the state civil services. In view of the changing role of the Government executives in a restructuring environment, the Academy felt the need for inducting a new perspective to strengthen the entrants. In view of this, the Academy approached selected bilateral agencies prominently USAID, to explore the possibility of a technical assistance in the above. Through the *Greenhouse Gas Pollution Prevention (GEP)-Climate Change Supplement (CCS) Project*, USAID/India has offered to provide support to LBSNAA for the development of training for entry level and senior level GOI officials on Clean Energy Development.

USAID requested that a Training Needs Assessment (TNA) be conducted in cooperation with the Academy in order to evaluate how USAID's support can properly assist the Academy in the development course content. Following the evaluation, a training implementation framework and illustrative curricula were designed as an illustrative means of integrating these new topics into LBSNAA's thematic curriculum. This report contains the proposed plan, recommendations, and a list of external institutional resources that may be of interest to the Academy.

The LBG/GEP Team visited the Lal Bahadur Shastri National Academy of Administration (LBSNAA) on August 14, 2000 in order to learn how the Academy imparts training to it's clientele. Discussions with Academy staff and supplemental material assist the TNA mission team to understand the curriculum development and training activities at the Academy. This understanding formed the basis for recommendations on how clean energy can best be linked to the Academy's - Public Administration, Management, Economics, and Law subject streams.

This report presents an innovative variation of the classic Train-the-Trainer methodology. This adaptation conforms to the Academy's high standard of academic talent and faculty members' pedagogic professionalism. Synoptically, the training implementation framework has the following elements:

- Selected faculty members participate in a brief, intensive workshop on clean energy development.
- Faculty members subsequently use their new knowledge to test and ultimately institutionalize curriculum elements for the Academy.
- In collaboration with U.S. counterparts, Academy faculty will carry out two pilot training sessions during which bi-directional learning occurs between instructors and audiences. Faculty members and U.S. colleagues teach clean development issues while the audiences (whose members have field experience in the energy sector) share their own first hand experiences.

I. INTRODUCTION AND BACKGROUND

India is the world's sixth largest and second fastest growing energy consumer in the world. New fossil fuel supply facilities, urban transportation facilities, and electric power generation facilities are being added at a rapid rate in order to quench the existing energy deficit as well as the growing demand. Despite this effort, shortages persist in electric power supply (20% in base load and 35% during Peak period) and continue to exist and stand as the major inhibitor of rapid industrial and economic growth. India's greenhouse gas (GHG) emissions have increased by about 40% in the last five years, third fastest rate in the world and is well beyond that of most emerging markets in the world.

The single largest source of carbon dioxide emissions in India is coal-fired power plants, which comprise the majority (about 70%) of electricity supply resources. India's per-capita power consumption and associated carbon dioxide (a major GHG) emission is far below the world average and India is not under any international obligation to reduce its GHG emissions. Therefore, USAID has identified India as one of the key climate change countries. The Climate Change initiative operates under the proposition that cost effective technological approaches exist for increasing energy efficiency and thereby reducing GHG emissions. The Climate Change initiative is interested in power solutions that are profitable, clean, and practical. In other words, the Climate Change initiative promotes power solutions that are preferable. Some of these technologies are Indian, and others originate from beyond India. Nonetheless, India's (4.6% GHG compared to the world average of 2%) is one of the ten key climate change countries identified by USAID and hence it is a part of the central focus of the USAID Climate Change (CC) Initiative.

A. Greenhouse Gas Pollution Prevention (GEP) Project

The USAID/India *Greenhouse Gas Pollution Prevention (GEP) Project* was launched in 1995 to ameliorate the volume of emissions of GHGs by improving the energy efficiency in coal-fired power plants and by encouraging efficient biomass fuels in selected industries, such as sugar plants. The GEP project activities improved the efficiency in selected coal-fired power plant operations and successfully established the Center for Energy Efficiency and Pollution Prevention (CENPEEP), within the National Thermal Power Corporation (NTPC). This activity has reduced over the two million tons of GHG emissions since 1996 and has resulted in increased attention by other plants both within NTPC and also others. The CENPEEP has become a national resource center for optimizing power generation efficiency from existing thermal power stations.

Under the *Alternative Bagasse Conversion* (ABC) component of GEP, nine cogeneration facilities in the range of 10 to 30 MW were established. The Industrial Development Bank of India (IDBI) assisted the financing of several projects in year-round efficient power cogeneration using biomass as fuel in the sugar industry. Several of these cogeneration plants exhibit better efficiencies comparable to the World standards, resulting in substantial GHG emission reductions and cost savings to adapting companies.

The GEP program has been instrumental in transferring experience, knowledge and technology between India and the United States. These efforts have resulted in an increased dialogue between the two nations, and contributed to the March 2000 signing of the *Joint Statement on Clean Energy*.

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B. Climate Change Supplement (CCS)

The USAID/India Climate Change Supplement to the GEP Project (GEP-CCS) was launched in September 1999. The GEP - CCS retained the efficient power plant operation component and expanded the ongoing efficient coal utilization and conversion activities under a new component entitled the *Efficient Power Generation*. The two new components to the GEP Program, under the Climate Change Supplement are - *Climate Change Initiatives for Sustainable Development* and *Linking Urban Development and Climate Change*. In 2000, The Louis Berger Group, Inc. (LBG) was awarded the contract by USAID/India to implement these two project components.

C. Building Awareness and Capacity in Various Sectors

The GEP-CCS project will address climate change and sustainability issues in three major areas: electric power sector, industry, and urban transport and municipal waste management. These will be accomplished by providing assistance in the development of electric power, industrial, transportation and municipal waste management projects and by building the Climate Change awareness in several sectors such as Government, Financial, Industry associations (Confederation of Indian Industries (CII), Federation of Indian Chamber of Commerce and Industry (FICCI)), prominent research institutions and associated academics, and non-governmental organizations (NGOs). These activities will ultimately strengthen the institutional capacity and technical capabilities of these Indian stakeholders and will create opportunities for greater dialogue and cooperation between the respective U.S. and Indian counterparts in government, private, research and non-government organizations.

D. Changing Role of the Government in the Energy Sector

Rapid population and industrial growth in India has resulted in increasing need for energy resources, power generation and finances. Current projections are to more than double coal production and power generation in less than ten years. New power plants are being planned and added at an increasing rate but substantial shortages (20% base load and 35% peak load) still persist. Further, transportation needs and associated fuel requirements are increasing at an alarming rate. Deficits in revenue collection relative to expenditures continue at a mounting rate and the Government is limited in resources to meet new developments. Although the increasing growth in the energy sector results in economic growth and improved standard of living, it has placed increasing strains on the financial resources and the quality of the environment.

The increasing need for financial resources in the energy development sector compounded with inadequacy of resources has resulted in the Governmental role changes. Government's role from a command and control operations has gradually changed to the one of facilitator, planner and regulator. In view of the resource crunch and the low creditworthiness of the state owned utilities, investments in the power sector have dwindled. In order to attract private funds, the sectoral reforms are essential. Under the new regime, the prices are likely to reflect the true costs. This situation provides a unique opportunity for introducing an incentive system that would follow from power sector reform and restructuring. Major environmental benefits could also be derived with reform and restructuring, especially as the distribution is privatized and becomes more efficient, when compared with the existing "business-as-usual" practices of today.

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The energy and power sector reforms in India will have profound implications for fuel prices, power generation costs and environmental management. India is moving from a publicly owned, vertically integrated, monopolistic power system with highly distorted administered prices for fuels and electricity to a more liberal system with market prices, competition, a greater role for the private sector, and commercial incentives. These changes will affect every aspect of the energy production system from the demand for electricity to the financial viability for all the entities involved to the choice of fuel and technologies, pricing decisions, and the respective roles and relationships among the state, the power sector, regulators, and fuel suppliers. Further international developments in GHG emission reduction technologies and environmental improvement technologies may provide economic incentives. During this time of transition, it is especially critical to take advantage of the opportunities available in order to improve economics and societal needs and concurrently protect the environment and avert threats to public health.

E. Capacity Building in the Government Sector

The GEP-CCS and other climate friendly projects implemented by USAID provide opportunities to build the knowledge and capacity (on the issues addressed above) in all sectors of the economy, including the Government sector. These projects associated with the clean energy development and electric utility sector reforms have evolved over the last decade and half in consultation with the GOI and the corresponding ministries. The technical assistance available under these projects have been extended to a limited number of GOI officials. Also the backgrounds of the IAS entrants differ and would thus need different levels of input. Thus, many new IAS officers and other senior personnel may need to be familiarized with Climate Change issues, which are both complex and dynamic.

As the role of the IAS officers change with restructuring, it is necessary to build their capabilities to address relevant energy and Climate Change issues. USAID believes that LBSNAA constitutes an appropriate forum for addressing the capacity building.

Economics

- Reduced energy costs to households, businesses, organizations, and governments.
- [redacted]
- [redacted]
- [redacted]

Health

- [redacted]

Transport

- [redacted]
- Job creation through development and deployment of new transportation technologies

EPA Global Warming Division

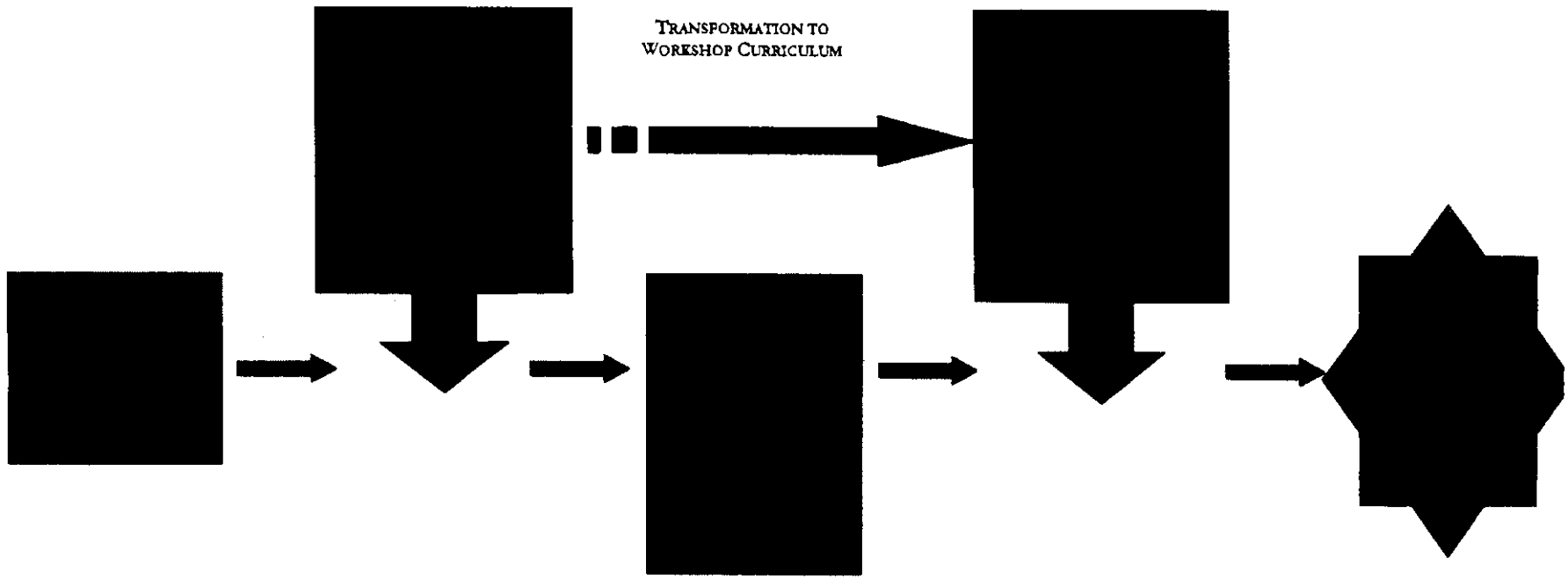
F. Knowledge Gap in Energy Issues

The mandate for the Lal Bahadur Shastri Academy is to promote an unimpeachable work ethic and provide training to ensure that the elite Indian Administrative Service (IAS) trainees become well-informed officers who can manage situations of any magnitude. The Academy currently provides training programs that encompass policy, economics, regulatory reform, and privatization issues. Energy sector development, as they relate to the power sector and infrastructure, are integrated in these courses. However, the discussion on the noted energy topics is limited as they are part of a broader curriculum. The extent of energy curriculum is minimal and is also focused on existing power sector and urban infrastructure programs. A gap therefore remains with respect to the current level of skills and curriculum in relation to creating informed decision-makers on clean energy development. The goal of adding clean energy development to the Academy curricula is to train IAS officers to understand and begin to link the current developments in the energy sector with sustainable energy and development issues in the context of the national, social, and economic development in their respective state and localities.

The first knowledge (See Table 1) is reflective of the changes necessary to make select Academy faculty member's effective providers on course content for clean energy development. We propose a modified "Train-the-Trainer" module to achieve this objective.

The second knowledge (See Table 1) gap is that between the faculty members and their clientele, IAS trainees and IAS officers. Faculty members need a forum and curriculum for transferring their knowledge and skills. Faculty members can develop a clean energy curriculum existing cases or fashions, the content into workshops, seminars and new courses.

GAP ANALYSIS MODEL



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II. OBJECTIVES

The objective of this activity is to strengthen the LBSNAA capacity on current developments in energy sector and sustainable energy development issues through curriculum development, training the trainers, and creating linkages with leading U.S. institutions.

The objectives of the TNA are three fold:

1. Assess the energy sector knowledge gap and training needs of the LBSNAA Faculty
2. Assess the clean energy development issues relevant for IAS officers and integrate these issues with global climate change and sustainable development issues
3. Assess the curriculum development and identify training program and schedule

The overall objective is to provide viable recommendations for training modules, methodology and schedule in regard to clean energy development issues.

III. METHODOLOGY FOR TNA DEVELOPMENT

The TNA mission team assembled to produce this TNA report utilized the following procedures:

- Conduct a site visit to the Lal Bahadur Shastri National Academy of Administration (LBSNAA) Mussoorie, India to interview Academy faculty and staff about current training programs, the systematic curriculum review process and future plans for integration of sustainable energy development in the context of national, social and economic policy objectives. Assess the LBSNAA's faculty capabilities with respect to the goals for the overall program.

- Review information concerning the structure of LBSNAA, including their website, printed brochures and program material, reference materials, training resources, training schedule and information provided by USAID/India.

- Conduct a detailed analysis of LBSNAA focusing on identifying its training needs, opportunities, impending changes and potential new directions with respect to integrating clean energy development, global climate change issues and sustainable energy development initiatives.

- Based on the gap analysis, develop a "Train-the-Trainer" methodology to include: 1. Implementation framework; 2.Illustrative training modules; 3. Training timeline. The schedule of activities for LBSNAA Faculty capacity building will focus on those actions, which will allow Academy to meet its goals quickly and cost-effectively.

- Provide a synopsis of relevant linkages for building future partnerships in technical curriculum with U.S. institutions and entities. These linkages will be resources for intellectual exchange and proper development growth. Generate ideas and a plan to build partnerships and linkages with organizations, programs, and institutions in the U.S. and other countries so that LBSNAA could learn from or leverage to meet its training needs, and increase its international network to those leading institutions in the energy development community.

IV. SCOPE OF TNA MISSION

The scope of work of the TNA mission consisted of:

1. Site Visit to LBSNAA
2. Review of LBSNAA Mandate and Training Activities
3. Energy Issues Gap Analysis and Purpose of TNA Mission
4. Review of Current Training Program and Facilities
5. Assessment and Findings
6. Training Program Development and Schedule
7. Identify suitable U.S./International linkages to sustain clean energy programs

The first three areas are described below in this section and the others follow in later sections.

Site Visit to LBSNAA

On Thursday, 10th of August 2000, the LBG/GEP Team had the opportunity to meet with Mr. S. Krishnan, Deputy Director of the Lal Bahadur Shastri National Academy of Administration at the USAID/India offices in New Delhi. Mr. Krishnan provided the team an initial background profile of the Academy and its interest in integrating sustainable energy development issues into the curriculum.

On Monday, 14th of August 2000 the LBG/GEP Team visited the Lal Bahadur Shastri National Academy of Administration in Mussoorie, India. At this meeting USAID/India was represented by Richard Edwards, Kavita Sinha and Srinivasan Padmanabhan. Members of the Academy present at the meeting included Binod Kumar (Joint Director), S. Krishnan (Dep. Director), L. C. Singhi (Dep. Director), Tarun Sridhar (Dep. Director), K.N. Kumar (Dep. Director), Uma Devi, A.K. Khan (Dep. Director), and Sadhna Malhotra of NSDART.

The main visit started with a short introductory meeting in the office of the Joint Director, Mr. Binod Kumar. This was followed by a visit to the Academy Library, which subscribes to 473 periodicals and has a permanent collection of about 140,000 books. The Library also has one of the three original copies of the Constitution of India.

The formal meeting started with an introductory presentation from Mr. Edwards of USAID/India after which LBSNAA academic staff provided information about their training structure and rationale. This was followed by a general discussion focusing on the relationship of emerging energy and climate change issues to the Academy training mandates and objectives.

Following the meetings at the Academy main campus, the TNA team visited the National Society for Promotion of Development Administration, Research and Training (NSDART, hereafter known as the Society), which also is located in Mussoorie. NSDART was established by LBSNAA to provide training to non-IAS officers, to conduct research, provide consultancy services and is

ultimately intended to be financially self-sustaining. The primary focus of the Society is to design, develop and impart training courses for IAS, and other interested GOI representatives. NSDART is thus well positioned to conduct training programs of relevance to the Academy's faculty without competing for critical staff resources.

Review of LBSNAA Mandate and Training Activities

In order for the Team to assess the viability of integrating emerging sustainable energy development policy issues into the LBSNAA curriculum, it was necessary to the Academy's current mandate and training initiatives. This was done in the following manner:

- Site visit to LBSNAA to discuss current and projected curricula initiatives
- Assessment of LBSNAA physical plant, reference materials and training resources
- Review of LBSNAA documentation provided through USAID/India Mission
- Review of LBSNAA curriculum and related information from Academy web site
- Review of LBSNAA training calendar/schedule for FY 2000
- Discussions with other selected in-country climate change stakeholders regarding institutional aspects of national policy development in relation to LBSNAA training programs
- Initial inventory of potential U.S.-based and key international counterpart institutions
- Post-mission discussions with USAID

The TNA mission team examined the Academy's attributes to establish a baseline from which a Train-the-Trainer methodology could be tailored. The assessment focused on identifying the Academy's institutional capabilities, and current training activities vis-à-vis energy development issues, and follow-up identification of potential areas of interest to expand the current curriculum.

Energy Issues Gap Analysis and Purpose of TNA Mission

Initial activities of the TNA Mission are to address the sustainable development in the energy sector so as to conduct a knowledge gap analysis leading to a training program. In its promotion of clean and sustainable energy practices, the USAID programs implement activities consistent with the goals of sustainable development defined by the Bruntland Commission as:

> ***"development which meets our current needs without compromising the capacity of future generations to meet theirs"*** – *Bruntland Commission*

Sustainable energy development involves the application of these same sustainable development principles to the energy field. It is critical that these principles be incorporated to respond to the dramatic changes envisioned for the Indian energy sector. In addition, to pricing reform and privatization, for example, India has established the goal to develop an additional 100,000 MW of power over the course of the next 10 years. To identify the finance requirements and supplying clean and efficient power, properly and adequately to the people of India, is a great challenge. To address this challenge, change in the role of the Government and private sector initiatives required are to be understood.

To bridge the gap in energy issues discussed above, training modules will need to be developed that reflect and emphasize the integral linkages between clean energy development, GHG issues, and

Library
The Gandhi Smriti Library of LBSNAA, houses a wide variety of books, and subscribes to over 429 periodicals, popular magazines and newspapers. Reference catalogs are computerized in the library.

Research Centers
For training to be relevant, it is important that it is supported and complemented by research. LBSNAA is also aware of its unique position in providing support to the Government of India for policy formulation through its research activities and by providing a forum for meaningful dialogue. It is with this in mind that a large number of research units have been established:

- Center for Cooperatives and Rural Development (CCRD)
- Center for Sustainable Development (CSD)
- Center for Development of Software for Training of Administrators (SOFTRAIN)
- National Center for Gender Training Planning and Research (NCGTPR)
- Land Reforms Unit (LRU)
- National Literacy Resource Center (NLRC)
- Training, Research and Development Cell (TRDC)
- Village Study Unit (VSU)
- Total Quality Management (TQM)

C. Training Facilities Outside of LBSNAA

NSDART - National Society for Promotion of Development Administration, Research and Training

The National Society for Promotion of Development Administration, Research and Training (NSDART) has evolved from the LBSNAA training structure to become a fully functional center for research and development that complements the current training structure of LBSNAA. The NSDART will work to convert research ideas into new training courses.

The activities of NSDART include research studies, development of training modules and preparation of case studies. NSDART is able to formulate research results and test new methodologies for the delivery of training modules. NSDART organizes seminars, workshops, and conferences on a regular basis.

NSDART is able to prepare, publish and circulate books, papers, periodicals, data, exhibits, films, slides, and engage in other literacy activities dealing with or having a bearing on the objectives of the

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Society. The NSDART has become a prominent appendage of LBSNAA and it has become the in-service training/support mechanism for the Academy.

NSDART programs complement the thematic arenas or subject streams of LBSNAA. The society undertakes research and consultancy in the four activity areas listed in the box:

NSDART Program Arenas

- [redacted] and Public
- [redacted] supervision
- [redacted]
- [redacted] Development

The Society facilities consist of a large facility with faculty/training rooms, office space for supporting staff, a library, computer lab, conference rooms and guesthouse.

The library houses a specialized collection of regional and primarily urban planning and environmental studies. The Society is also linked into the Gandhi Smiriti Library of LBSNAA.

IIPA : The Indian Institute of Public Administration

The mandate of IIPA is to stimulate the proper study of public administration and directly train a number of individuals in the administration. Significant contributions of this facility are research, training, advisory workshops/seminar. The institute currently aims in ensuring better and effective interaction between the members of the faculty members, improving academic output and consequent academic satisfaction at the following centers:

- Center for Pubic Policy, Planning and Environmental studies
- Center for Economic Analysis and Finance Management
- Center for Human Resource Development and Behavioural Studies
- Center for Managerial Studies, Public Enterprise and Computer Application
- Center for Rural Development Administration
- Center for Urban Studies
- Center for Social Welfare Administration and Administration of Justice
- National Center for Disaster Management

IIPA conducts an extensive amount of training that is driven by recommendations from the respective ministries, state, and local governments. The institute also designs and develops training courses upon specific request. The key areas of training are listed in the box.

IIPA Training Courses

- Indian Social, Political and Economic Systems,
- [redacted]
- Rural Development

Over the years, the institute has developed several key partnerships with universities, advanced research centers, training institutions

and government departments to enhance its technical capabilities. The overall activities of the institute are training, research, advisory service and dissemination of information. The institute undertakes research on substantive issues on its own initiative, as well as those sponsored and promoted by government and international organizations. This work has led the institute to provide consultancy issues on operational and policy development issues to the GOI..

VII. ASSESSMENT AND FINDINGS

The Academy's course offerings and curriculum development process were examined in the context of opportunities for incorporating curriculum aspects of clean energy development into the Academy's course offerings. These elements include energy efficiency, clean energy development and greenhouse gas emissions.

The initial assessment and findings of the TNA mission follow:

Curriculum Development

The Academy expressed a desire to upgrade their training materials, and skills on energy development issues. The team understood that the detailed structure of the Academy's training programs and course contents are decided well in advance. As a result it is a lengthy process to introduce new courses. There are eight thematic areas of emphasis at the Academy as noted earlier. The amount of time spent in teaching each of these areas varies depending on their applicability during the careers of IAS officers. The overall curriculum is set by the Ministry of Personnel and Training, but the Academy administration has considerable autonomy and flexibility in choosing contents and arranging topics to be included for training. Several hours of lecture sessions are set-aside in each thematic area to address topics of current interest. These lectures typically are conducted with the help of senior government officers who are in responsible positions in concerned ministries.

Areas of Interest

The team had an opportunity to meet with Mr. S. Krishnan upon the TNA mission to the Academy. Mr. Krishnan expressed interest for developing course materials and providing support on Energy Supply; Energy/Environment Interface and Sustainable Development; Regulation and Market Development and emerging issues related to international treaties.

Mr. Krishnan indicated that initially, the infrastructure related topics on power and energy would be of interest in the Professional course, and a maximum of two, 50-minute sessions consisting of basic energy development issues. These courses would provide an initial overview of the related topics on clean energy development. In addition, it was note that in-service courses and workshops could be considered as venues to introduce topics to a selective, interested audience.

Thematic Areas

The LBSNAA Academy training structure comprises four central course structures. These include the Foundation, Professional, In-Service Short Courses and Workshops and Seminars.

Although energy sector training is not the Academy's focus, power sector reform and infrastructure issues are indeed taught during the Public Administration, Economics and Law sections. The Power sector scenarios and issues are currently taught within a 1-2 session timeframe. The Team was told that topics on power and energy would be of interest at the Academy, but that availability would be limited. Initially, two 50-minute sessions could be offered to the officers attending the Professional level course. In-serve trainings and Workshops, because of their topical focus, have the most flexibility in introducing topics in a timely manner. Some of these topics can be selected from the list provided in Annex I.

An introduction to the policy aspects of clean energy development can be facilitated through in-service training on power sector and energy efficiency projects, promoting energy entrepreneurship and renewable energy development. Candidate thematic areas through which such contents could be introduced include, but are not limited to, Public Administration, Economics and Law.

Faculty Teaching Skills

The recommended method for building capacity of select Academy faculty members in clean energy development is through intensive faculty workshops, a U.S. study tour, and pilot training conducted in collaboration with U.S counterpart experts in the field.

Linkages Outside of LBSNAA

The Academy has developed linkages with several universities to broaden the network and training capacity of the Academy. NSDART was established by the Academy, to provide in-service training outside for non-IAS officers and to conduct research and studies that will support LBSNAA activities.

VIII. TRAINING PROGRAM AND SCHEDULE

A. *Train-the Trainer Methodology for Faculty Members*

The Academy maintains a high-level of excellence among its faculty members. The LBSNAA instructors are knowledgeable, intimate with innovative teaching techniques. The recommendations provided by the TNA team concerned with providing clean energy content to the existing LBSNAA curriculum on training techniques. The training modules listed in the following Section C can be integrated into the currently used models of the Academy curriculum or can be expanded to reflect new class developed initiatives that will be undertaken by the Academy.

Table 2 describes a Train-the Trainer process or methodology. The objective of the process is to first identify LBSNAA faculty members who are interested in climate change issues in the energy sector and provide them the tools and techniques to gain a thorough understanding of issues related to sustainable energy development. These new ideas can then be integrated appropriately into the respective course modules.

The recommended T-t-T program will use a wide variety of outreach and educational tools to ensure innovative techniques are incorporated into the strategic overview. These techniques will include, working group "Brain Trust" session, U.S. Study Tour and Case Studies.

The outcomes of a T-t-T model are three fold:

- Sustainable Course Providers on Sustainable Energy Development
- Sustainable Training Modules
- Sustainable Linkages to U.S/International Institutions

TABLE 2: TRAIN-THE-TRAINER PROGRAM OBJECTIVES AND TASKS

Objective: - Achieve Training partnership linkages between LBSNAA and USAID/India - Initiate capacity building of LBSNAA Faculties in Clean Energy Development education	Objective: - Create and institutionalize clean energy curricula - Deepen faculty knowledge on clean energy issues	Objective: - Sustainability of Clean Energy Development curriculum Complete Curriculum Institutionalization
• Identify LBSNAA Point of Contact • Provide an Illustrative Training Program of Interest to LBSNAA • Intensive Faculty Workshop on Clean Energy Curriculum Development. (Training #1: Train-the-Trainers) • LBSNAA U.S. Study Tour • Enrichment of Course Curriculum	• Pilot Training with NGO/Industry Personnel (Training #2: Train-the-Trainers@ NSDART) • In-Service Workshop for Senior IAS Officials (Training #3: Train-the-Trainers) • Establish a LBSNAA Clean Energy Group • Curriculum "Certification" Completed	• Official "Kick-Off" for Clean Energy at LBSNAA • Sustain U.S./International and Domestic Linkages for Clean Energy

B. Strategy for Integration and Implementation of a Training Program

The Train-the-Trainers program at the academy will begin the process of integrating energy development issues into the curriculum. The following short term, medium term and long term strategies have been outlined as milestones in developing a sustainable system.

Identify LBSNAA Point of Contact: - The first step in the process is for the Academy to identify a faculty member-liaison who will have vested interest in sustainable energy issues. The liaison will serve as the primary point of contact for the Academy and will identify and coordinate with those interested and suitable faculty members for the trainings sessions. The LBSNAA liaison will work with faculty to determine and prioritize the Academy's interest on Clean Energy Development. The LBG will serve as the "clearinghouse" for identifying U.S Experts and technical resources for the program and further modify and frame the respective training modules on energy issues. It is recommended that a LBSNAA Point of Contact is recommended by the end of December, 2000.

Illustrative Training Program of Interest to LBSNAA – LBG, USAID/India and the identified LBSNAA Point of Contact, will work the identified LBSNAA liaison to discuss the proposed Train-the-Trainer program and tailor interest of the Academy accordingly. It is

anticipated that the initial discussions and understanding of the approach will be concluded by January 31, 2001.

Intensive Faculty Workshop on Clean Energy Curriculum Development (Training #1: Train-the-Trainers) – The first training will allow the faculty an opportunity to initially absorb and gain a better understanding of the respective issues. Furthermore, the workshop will assist the faculty members to refine topical issues to be integrated into the various faculties of the academy. Based on the interest of the LBSNAA Participants, the TNA would anticipate 10-15 LBSNAA faculty in attendance. Three (3) U.S. experts will conduct the first intensive faculty workshop. The likely date for the intensive workshop would be held over a 3 day period in early March (est. March15-18, 2001).

U.S. Study Tour j LBG/GEP will design and develop a U.S. Study Tour for the LBSNAA identified faculty. The study tour will provide the selected (7-10) Academy faculty with an opportunity to gain a better understanding of issues related to sustainable energy development. The emphasis of the tour will be to provide exposure and build a practical background on international policy issues and solutions and various perspectives. In the US, training is employed on clean energy development issues, primarily by Research Institutions, NGOs and trade associations in the Private Sector. The study tour will provide a technical background for the faculty. Institutions such as the Federal Executive Training Institute will provide a model for training government/administration representatives. The result of the study tour will provide material to incorporate into curriculum elements. The tour will also provide the additional linkages with leading U.S. training and research institutions for the Academy and faculty. The U.S. Study tour will be held over a 10 day timeframe and is projected to be conducted in early July , 2001 (est. July 1-11, 2001)

Enrichment of Course Curriculum j Upon the conclusion of the U.S. Study Tour, the faculty will refine and enrich the clean energy modules, over a 3-week timeframe, in preparation of a pilot training course with a U.S. counterpart that they will complement their current training programs.

Pilot Training with NGO/Industry Personnel (2nd Training: Train-the-Trainer at NSDART) – The second training will be held several weeks after the U.S. Study tour, which will allow the faculty to develop case studies, and teaching aids. The second training will be co-taught by the respective (7-10) LBSNAA faculty and the two (2) U.S. counterparts. This training will be held under the auspices of National Society for Promotion of Development Administration, Research and Training (NSDART) and could take place in either of the two centers in Mussoorie or at IIPA in Delhi. The second training will allow the faculty members an opportunity to pilot the new training module or topics and further refine the course structure. The training will be provided to a broader audience, an estimated 20 participants, of interested NGO/Industry Personnel who work in the energy sector. The NGO/Industry audience will provide the faculty "real life" clean energy case studies that will be instrumental in enriching the Academy's clean energy curriculum. Furthermore, the training will broaden the Academy's linkages to in-country institutions and organizations that may be key resources in the in promotion of clean energy development. The pilot training will be held

three weeks after the completion of the U.S. Study tour. The probable pilot training would be conducted over a 5-day period from August 1-6, 2001.

In-Service Workshop for Senior IAS Officials (3rd Training: Train-the-Trainer) – The (7-10) Academy faculty members and two (2) U.S. Experts will co-teach the identified clean energy issues while the 10-15 Senior IAS Officials (who have field experience in the energy sector) share their own first hand experiences. These experiences will become the basis of case studies that can be used to enrich the standard teaching curriculum of the academy or that can become the bases for new workshops and short courses. The three participant groups at the workshop: faculty, US experts, and IAS Officials will create a dynamic discussion on global perspectives on clean energy. The faculty members and US Experts will contribute perspectives on clean energy technology, environmental impacts (learned during 1st Training) and private sector and NGO constraints (learned during 2nd Training). The IAS Officers will provide the latest perspectives from the India policy arena. The In-Service Workshop is likely to be held in late November, 2001 (est. November 28-December 4, 2001).

LBSNAA Clean Energy Curriculum development - By the time faculty members have participated in the first three training sessions, the Academy will possess a cadre of faculty committed to clean energy issues. At this time, the TNA team suggests that the Director of LBSNAA, in consultation with the Liaison Officer, develop an informal Clean Energy Group, to consist of 5 LBSNAA members, to provide guidance for curriculum development. It is recommended that the Clean Energy Group be assembled by the end of December 2001.

Curriculum pCertificationp Completed – The TNA Team envisions a process, wholly owned by the academy, where by selected faculty members are certified for clean energy instruction. The steps for the process will be determined by the Clean Energy Steering Committee, which will be authorized by the LBSNAA Governing Administration. The certification process will provide the framework of recognizing the LBSNAA faculty as efficient course providers on Clean Energy issues. The first batch of trainers will be jointly certified by the U.S. counterpart institution/individual at the conclusion of the In-service training.

Official oKick-Offp for Clean Energy at LBSNAA j The Official Kick-off meeting will formally introduce the designed and developed training modules on clean energy issues. The Kick-Off meeting could be held during the month of February, 2001.

Sustain US/International and Domestic Linkages for Clean Energy j The LBG/GEP team will continue to facilitate Academy relationships with US/International and Domestic institutions so that the trained faculty members can keep abreast of developments on clean energy issues.

C. Illustrative LBSNAA Training Modules for Promoting Clean Energy Development

- Rural renewable energy development

Energy-Efficient Transmission:
- Infrastructure maintenance
- Transmission technology
- Regulatory and market issues

Distribution:
- Revenue generation and its role in sustainable support of the grid
- Prevention of energy theft
- Consumer education

MODULE 2: ENERGY POLICY IMPLEMENTATION IN URBAN AND RURAL ENVIRONMENTS

As the Indian energy sector reforms and the Government of India role changes, IAS officers are called upon to serve new roles and to master issues previously outside its purview. This module provides faculty members with an introduction to the trend towards privatization of the energy sector and the regulatory and policy changes likely to affect this trend. The module will feature advantages of "leapfrog" technologies – those that allow the skipping of standard technologies in favor of economically and environmentally better technologies. The module will tie into (and may be partially incorporated within) existing courses in economics and management.

GOI officials in this area will be invited as guest lecturers to provide current perspectives on government policy. These guest lecturers will become points of contact for the academy to remain informed of new developments in India's evolving energy policy.

Objectives: LBSNAA faculty formalizes a clear vision with colleagues and guest experts on how IAS officers implement the GOI's energy policy. They will practice conveying this vision to trainees.

Output: Faculty members will create teaching materials and learn how to maintain an up-to-date knowledge of GOI's energy policy through linkages with key GOI [illegible]

Audiences: [illegible] can be adapted fo[illegible] be a proper [illegible] have responsib[illegible]

Overview: The role [illegible] will be explained [illegible] of the energy sect[illegible]

Issues/To[illegible]

- GOI [illegible]
- Mark[illegible]
- Role o[illegible]
- Regul[illegible]
- Ratio[illegible]
- Introd[illegible] leapfrog techno[illegible]
- IAS of[illegible] gy policy

Methodolo[illegible]
Lectures, g[illegible] sector representat[illegible]

Timefram[illegible]
Three-day [illegible] can subsequent[illegible] academy trainees as [illegible] academy courses by [illegible]

Skills to b[illegible]
Faculty me[illegible] topics and course[illegible] into the Academy's applied economics and policy curriculum.

Results:
Faculty members will improve their understanding of the GOI energy policy that IAS trainees will implement in the field.

MODULE 4: CLEAN ENERGY PROJECTS DEVELOPMENT

External resources exist for assisting the private sector and non-governmental organizations to promote clean sources of energy. The GOI's energy policy can be promoted through externally funded projects in energy efficiency and clean energy. The IAS officers would be introduced to various facets of Project Development with special emphasis on GHG mitigation projects. This module will help them particularly in their roles at regulatory bodies that accord approvals. They will also be able to understand the intricacies of making GHG mitigation projects bankable. The IAS officer can play a facilitating role in the matching of donors to potential recipients, thereby promoting efficient use of donor funding in places that might not otherwise produce successful project competitors. Particularly in rural areas, which receive modest attention from private sector power generators, IAS officer can identify local government and non-governmental entities that could be eligible for support by externally funded projects. By facilitating externally funded clean energy projects, the IAS officers encourage, cleaner and cheaper energy production, and reduce environmental costs.

Faculty members will receive and design training on project evaluation and monitoring, inasmuch as such government verification roles are anticipated in many such projects.

IAS personnel will become familiar with important industry associations in the energy sector and with non-governmental organizations concerned with rural energy development.

Objectives: LBSNAA faculty will learn about clean energy project opportunities and how IAS officers may help non-governmental entities and local governments to compete for such projects. Faculty will also learn to teach IAS officers about project monitoring and evaluation in the context of clean energy.

Output: Faculty members will complete a workshop on sources of funding for clean energy development projects. They will receive instruction in monitoring and evaluation of field projects. By the end of the workshop, faculty members will have developed a training curriculum and proposed [illegible] for placing the curriculum in existing [illegible]

Audience: [illegible] faculty-oriented workshop, the [illegible] officers who work with stakeholders [illegible] IAS trainees destined to do so.

Overview/Synopsis: [illegible] LBSNAA faculty [illegible] energy programs and their project [illegible] participate project monitoring and [illegible] IAS officers and respond with appropriate [illegible]

Issues/Topics to be [illegible]

- Government [illegible]
- Non-governmental [illegible] work
- Project funding [illegible] support
- Project financing [illegible]
- Project monitoring [illegible]

Methodology/Technique: [illegible] supplemental reading material, [illegible] exercises for project monitoring and evaluation.

Timeframe/Training: [illegible] workshop for LBSNAA faculty. [illegible] incorporated into the academy's existing [illegible] administration. Project monitoring and evaluation [illegible] taught as a special seminar for in-service training programs subsequently. Monitoring and evaluation could be added to the public administration curriculum.

Skills to be learned: concepts in project monitoring and evaluation

Results: IAS faculty members will be able to provide their trainees with relevant information on clean energy project funds and where to seek them. IAS field agents will, in turn, be able to share this information with their constituencies. Project monitoring and evaluation will be added to the academy curriculum as a valuable tool for future field agents with responsibilities for verification and project compliance.

IX. CONCLUSIONS AND RECOMMENDATIONS

The LBG/GEP Team has completed the TNA of LBSNAA and has developed the training program outline and the training schedule. An innovative variation of the classic Train - the - Trainer methodology was developed to confirm to the academy's high standard of talent members, i.e. IAS officers. The training involves a brief intensive workshop on clean energy projects development to the faculty followed by two pilot test-training sessions, after institutionalizing the curriculum elements. This will allow trainees to be participants in developing the case studies. The feed back from two sessions and the case studies will enrich future workshops and short courses.

The TNA Team has developed four illustrative training modules, which can be customized to complement existing curricula:

- **Sustainable Energy Supply in Rural and Urban Environments**
- **Energy Programs Implementation in Urban and Rural Environments**
- **The Economic/Environment Interface of the Energy Sector**
- **Clean Energy Projects Development.**

The training modules and training implementation framework can achieve the short, medium, and long-term training needs. Sustainable transfer of clean energy knowledge to current and future IAS officers can be accomplished with proper implementation of the training program.

The team recommends that the Academy Director appoint a Liaison Officer to serve as the main contact during the development and implementation of the training program. Further, the TNA team recommends that the selected participants from the first faculty's intensive workshop participate in a US study tour which will provide an opportunity for Academy's champions in this area to engage leading academics, NGOs and others working on clean energy and policy issues in the United States.

ANNEXURE

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ANNEX A: LIST OF ILLUSTRATIVE TOPICS

TOPICS FOR A CLEAN ENERGY DEVELOPMENT CURRICULUM

See the proposed training modules for an illustrative organization of these topics into training themes.

- Consumer education
- Cost of pollution: Hidden energy costs, monetization of emissions, and their environmental impact
- Economic development and emissions: local and global impacts
- Emissions issues in urban and rural environments
- GOI energy privatization policy
- Government partnership in the energy sector
- Introduction to urban (on-grid) and rural (off-grid) leapfrog technologies
- IAS agents as facilitators for implementation of GOI energy policy
- Market development
- Meeting demand for access to clean, inexpensive energy
- Minimizing environmental impact, maximizing efficiency, securing supply
- Non-governmental partner entities and how they work
- Project funding: local, national, and international support
- Project monitoring and evaluation
- Protecting investment and infrastructure through market-based tariffs
- Rational pricing
- Regulation and deregulation
- Role of private sector investment
- The energy sector and economic development in urban and rural environments
- Understanding Environmental Impact Assessment (EIA)

ANNEX B: U.S. AND INTERNATIONAL COUNTERPART INSTITUTIONS AND RESOURCES

Considerable institutional resources related to policy aspects of sustainable energy, including its relationship to greenhouse gas production, have been developed in the United States. In recent years, driven by relatively low energy prices, these programs have increasingly focused on the environmental and greenhouse gas elements of research. However, many of these organizations maintain an active interest in sustainable energy per se, and may offer considerable resources to LBSNAA. Programs of particular interest in formulating policy dialogue and related training program agendas for LBSNAA have been identified at the following institutions:

Princeton Center For Energy And Environmental Studies The Princeton University Energy Systems and Policy Analysis Group carries out science and engineering-based analysis aimed at establishing a technological basis for public and private-sector policy initiatives to encourage the development and deployment of energy technologies that contribute to the solutions of major societal problems, including global climate change, urban air pollution, over-dependence on energy from politically unstable regions, the risk of nuclear weapons proliferation, and the poverty of developing countries. The energy group explores energy strategies that are prospectively: *(i)* appropriate for a world where environmental and security objectives are prominent, *(ii)* compatible with societal economic goals, *(iii)* technologically innovative to be responsive to multiple societal concerns posed by conventional energy, and *(iv)* potentially achievable in 10 - 30 years' time. The group develops detailed energy systems studies for particular technologies and strategic energy analyses describing the prospects for clusters of promising technologies and their policy context. Activities over the last year include strategic analyses relating to fuels decarbonization/CO2 sequestration and energy innovation and systems studies relating to biomass energy and the use and production of hydrogen.

Contact Information:
Web site: http://www.princeton.edu/ ~cees/
Princeton Environmental Institute
25 Guyot Hall, Princeton University
Princeton, New Jersey 08544-1003
Tel: (609) 258-5985 Fax: (609) 258-1716

Center for Energy and the Global Environment (CEAGE) Located at the Alexandria Research Institute of Virginia Tech. This center was established in 1994 to provide faculty members from universities worldwide the opportunity to discuss clean energy development and issues related to environmental impacts. Seminars, workshops, post-graduate courses and research projects conducted by CEAGE take advantage of resources within the departments of Architecture, Civil and Environmental Engineering, Crop and Soil Environmental Sciences, Electrical and Computer Engineering, Fisheries and Wildlife Sciences, and Political Science.

CEAGE is a research and educational center that examines issues related to energy and its role in the global environment. CEAGE is charged with determining environmentally compatible methods of power generation and use in all parts of the world. The objective of the Center is to study and facilitate the implementation of cost-effective ways of generating and using various forms of energy (including electricity) such that their impact on the environment is minimized. The Center's personnel believe that challenges to energy development and environmental sustainability are global in nature. Consequently global solutions with mutual agreements are needed. However, meaningful

agreements can only be reached and sustained when steps are taken to address their long-term implications that include adequate transfer of technologies and appropriate operation and management practices.

CEAGE is particularly interested in working with the developing countries and the emerging economies in Europe. The Center's personnel offer seminars, workshops, training programs and joint research activities in collaboration with scientists and researchers from the U.S. and international institutions. The goal is to formulate regional and global solutions for energy development and environmental sustainability through mutual understanding. The Center is also able to conduct these services in the regional countries of Africa, Asia, Latin America and Europe in order to allow broader participation. Institutions in more than 30 countries on six continents have existing linkages with the Center. In addition, other universities and corporate and government research laboratories liaise with CEAGE. These relationships foster technical discussions that can help bring about energy development and use in conjunction with environmental protection.

Contact Information:
Professor Saifur Rahman
Alexandria Research Institute
Alexandria, VA 22314, USA
Telephone: 703-518-8080
Fax: 703-518-8085
Email: srahman@vt.edu
Web site: http://www.ee.vt.edu/ceage/

Federal Executive Institute. The United States Federal Executive Institute (FEI) is a development center for senior executives. FEI provides senior executives in the US federal government many of the team-building and team management skills that LBSNAA teaches in its Foundation program. FEI programs attend to issues in interagency cooperation and conflict and in management effectiveness. The Institute does not teach energy sector issues, but its mission has a parallel to LBSNAA's Foundation program. FEI does provide training on environmental issues, natural resources, and public policy to senior government administrators, and, therefore, may be a useful contact for sharing pedagogical methods.

1301 Emmet St.
Charlottesville, Virginia 22903-4899 USA
telephone: 804-980-6200
fax 804-979-3387
Email: fei@opm.gov:
http://www.leadership.opm.gov/lc80.html

Electric Power Research Institute (EPRI) EPRI is a nonprofit organization committed to providing science and technology-based solutions to its global energy customers. To carry out this mission, EPRI manages an extensive program of scientific research, technology development, and product implementation.
Located in California in the heart of the Silicon Valley, EPRI offers science and technology capabilities across all segments of the world's energy industry. From power generation and delivery to energy use, they are recognized as the global resource for energy and related environmental solutions. EPRI currently serves more than 1000 energy-related organizations in 40 countries. With expertise in a wide spectrum of scientific research, technology development, and product

application, they are able to offer solutions that cut across traditional boundaries, taking advantage of the latest advances in many fields.

Web site: http://www.epri.com

Contact Information
EPRI
3412 Hillview Avenue
Palo Alto, California 94304
USA

Center for Integrated Study of the Human Dimensions of Global Change Located at Carnegie Mellon University, the Center is a coordinated research program by 38 principal investigators interested in interactions of society and the environment.
Contact Information:
Center for Integrated Study of the Human Dimensions of Global Change
Carnegie-Mellon University
Web site: http://hdgc.epp.cmu.edu

Contact Information
Terri Jones, Coordinator
Center for Integrated Study of the Human Dimensions of Global Change
Department of Engineering & Public Policy
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213 USA
Phone: (412) 268-1087
Fax: (412) 268-3757
E-mail: tjones@andrew.cmu.edu

Center for International Earth Science Information Network (CIESIN) CIESIN provides data for the serious researcher in the scientific and policy fields related to global change studies. This site has interactive applications, including one where users can become involved in the IPCC process to develop new emissions scenarios for the 21st century. CIESIN is part of the Columbia Earth Institute at Columbia University in Palisades, New York. CIESIN was established in 1989 as a non-profit, non-governmental organization to provide information that would help scientists, decision-makers, and the public better understand their changing world. CIESIN specializes in global and regional network development, science data management, decision support, and training, education and technical consultation services. CIESIN is the World Data Center A (WDC-A) for Human Interactions in the Environment.

Contact Information
Center for International Earth Science Information Network
Columbia University
Web site: http://www.gcrio.org
61 Route 9W
PO Box 1000
Palisades, NY 10964
Phone: 1-(845) 365-8988
FAX: 1-(845) 365-8922

E-Mail Contacts:
Roberta Balstad Miller, Director
roberta@ciesin.columbia.edu

Robert Chen, Deputy Director
bob.chen@ciesin.columbia.edu

General E-mail
ciesin.info@ciesin.columbia.edu

Harvard University Global Environmental Assessment (GEA) The Global Environmental Assessment (GEA) project seeks to promote better understanding of the actual relationships among science, assessment, policy and management in societies' efforts to grapple with global environmental change. The project is a multiyear, interdisciplinary effort based at Harvard University but drawing on faculty and students from the natural sciences and social sciences as well as practitioners and professional school scholars from around the world. The project has focused on assessment experience in global climate change, ozone depletion, transboundary air pollution, and biosafety with special attention to North America, Europe and India.

The Global Environmental Assessment project is supported by a core grant from the National Science Foundation (Award No. SBR-9521910) for the "Global Environmental Assessment Team." Supplemental support to the GEA Team is provided by the National Oceanic and Atmospheric Administration, the Department of Energy, the National Aeronautics and Space Administration, the National Science Foundation, and the National Institute for Global Environmental Change. Additional support has been provided by the Department of Energy (Award No. DE-FG02-95ER62122) for the project, "Assessment Strategies for Global Environmental Change," the National Institute for Global Environmental Change (Awards No. 901214-HAR, LWT 62-123-06518) for the project "Towards Useful Integrated Assessments," the Center for Integrated Study of the Human Dimensions of Global Integrated Assessment at Carnegie Mellon University (NSF Award No. SBR-9521914) for the project "The Use of Global Environmental Assessments," the Belfer Center for Science and International Affairs at Harvard University's Kennedy School of Government, the International Human Dimensions Programme on Global Environmental Change, Harvard's Weatherhead Center for International Affairs, Harvard's Environmental Information Center, the International Institute for Applied Systems Analysis, the German Academic Exchange Service, the Heinrich Böll Foundation in Germany, the Massachusetts Institute of Technology's Center for Environmental Initiatives, the Heinz Family Foundation, the Heinz Center for Science, Economics and the Environment, and the National Center for Environmental Decisionmaking Research.

Contact Information:
Harvard University Global Environmental Assessment (GEA)
Web site: http://environment.harvard.edu/gea

For information please contact:
William C. Clark (Director, Principal Investigator)
Harvey Brooks Professor of International Science, Public Policy and Human Development,
Kennedy School of Government
Harvard University;
Director, Global Environmental Assessment Project

Mailing address: Belfer Center for Science and International Affairs
Kennedy School of Government
Harvard University
79 JFK Street
Cambridge, MA 02138
Phone: (617) 495-3981
Fax: (617) 495-8963
Email: william_clark@harvard.edu

The MIT Joint Program on the Science and Policy of Global Change is an interdisciplinary organization for research, independent policy analysis, and public education in global environmental change. Established in January 1991, the Global Change Joint Program seeks to provide leadership in understanding scientific, economic, and ecological aspects of climate change, and to combine these considerations into policy assessments that serve the needs of ongoing national and international discussions. To this end, the Program brings together an interactive group of experts from two complementary research centers at MIT: the Center for Global Change Science (CGCS) and the Center for Energy and Environmental Policy Research (CEEPR). The resources of the two parent centers are strengthened by links to the Ecosystems Center at the Marine Biological Laboratory (MBL) in Woods Hole, Massachusetts, to other departments at MIT, and to industry groups. The Program involves active participation by a supporting partnership of U.S. government organizations and international industrial sponsors. In addition, the Program is engaged in collaborations with leading research institutions and non-profit organizations worldwide.
Through the CGCS and the Alliance for Global Sustainability, the Program is involved in formal cooperation with the climate modeling efforts at the Max Planck Institute (for Meteorology) in Hamburg, the University of Tokyo, and the Swiss Federal Institutes of Technology (ETH) in Switzerland. The Program also maintains significant ties with climate researchers at both national and international research organizations.

Contact Information
The MIT Joint Program on the Science and Policy of Global Change
Web site: http://web.mit.edu/globalchange/www/
Tel: 617-253-7492
Fax: 617-253-9845
E-mail: globalchange@mit.edu
Postal Address:
77 Massachusetts Avenue
MIT Bldg. E40-271
Cambridge MA 02139 USA

Resources for the Future (RFF) RFF is a nonprofit and nonpartisan think tank located in Washington, DC that conducts independent research - rooted primarily in economics and other social sciences - on energy, environmental and natural resource issues. RFF also provides "Weathervane" — a digital forum on global climate policy discussed by invited guests.

Contact Information:
Resources for the Future
Web site: http://www.rff.org

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1616 P Street NW
Washington, DC 20036
phone (202) 328-5000
fax (202) 939-3460

World Resources Institute (WRI) WRI is a tax-exempt, publicly supported, educational organization. WRI's current areas of work include energy, economics, forests, biodiversity, climate change, sustainable agriculture, resource and environmental information, trade, technology, national strategies for environmental and resource management, business liaison, and human health.

Contact Information:
World Resources Institute
Web site: http://www.wri.org
10 G Street, NE (Suite 800), Washington, DC 20002 USA
Phone: 1-202/729-7600
Fax: 1-202/729-7610).
For more information contact ctyrpak@wri.org

Additional Organizations and Institutions Although the above organizations and institutions have well-recognized programs related to sustainable energy and climate change, other initiatives of interest to the Government of India also have been identified. Following is a list of other organizations (University, Governmental, trade association, institutional and NGO) that offer resources and/or information of possible interest to LBSNAA. These are based primarily in the US, but also include selected key international sites.

University-Affiliated Resources

International Research Institute for Climate Prediction (IRI) The International Research Institute for climate prediction has recently been established through a cooperative agreement between NOAA/Office of Global Programs and Columbia University/Lamont-Doherty Earth Observatory. The mission of the IRI is to continually assess and develop seasonal-to-inter-annual climate forecasts, and to foster the application of such climate forecasts to the explicit benefit of societies. The IRI will address all aspects of end-to-end prediction, including model and forecast system development, experimental prediction, climate monitoring and dissemination, applications research, and training, in coordination and collaboration with the international climate research and applications community. The Institute will eventually assume multi-national governance, and will coordinate with meteorological and hydrological services and other agencies in the delivery of forecast products and the establishment of climate applications activities on a worldwide basis

Asia-Pacific Network for Global Change Research (APN) APN is an intergovernmental network that promotes global environmental change research and links between science and policy-making in the Asia-Pacific Region, increases developing country research participation, and strengthens ties between scientists and policy makers. Funded by the Environmental Agency of Japan, the U.S. Global Change Research Program, and matching support from participating countries, the network supports research activities on global climate change and related physical and social processes.

Aspen Global Change Institute(AGCI) The Aspen Global Change Institute is a Colorado non-profit organization dedicated to enhancing understanding of global scale environmental change and the role of human beings in that change. AGCI also helps to educate decision-makers, students, and the public about the science of global change and its ramifications. To these ends, AGCI convenes

interdisciplinary meetings of the world's leading scientists, enabling them to work together at the cutting edge of a variety of topics of critical importance in the global change arena. The goal of these meetings is not only to further scientific understanding across disciplines, but also to serve as a catalyst for researchers to collaborate on new work

Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) CSIRO is Australia's largest scientific research agency. CSIRO's Atmospheric Research Division addresses issues such as urban and regional air pollution, acid deposition, the enhanced greenhouse effect, ozone depletion, climatic variability and severe weather. The Climate and Atmosphere Sector covers the economic, social and environmental impact of weather and climate, as well as the effect of economic and social activities on climate and atmosphere.

Center for Global Environmental Research (CGER) CGER is a governmental organization sponsored by the National Institute for Environmental Studies, Environment Agency of Japan. It promotes the integration of global environmental research from interdisciplinary, multi-agency, and international perspectives to improve scientific understanding of human impacts on climate. It also provides a basis for developing mitigation and adaptation policies by supporting research, monitoring, and disseminating data.

Climate Action Network (CAN) The CAN Directory provides a list of non-profit organizations worldwide working on different aspects of the climate change issue. The CAN Newsletter provides commentary on international negotiations taking place under the U.N. Framework Convention on Climate Change.

Climate Change Secretariat The Climate Change Secretariat administers the proceedings under the U.N. Framework Convention on Climate Change. All official documents under the UNFCCC can be obtained here, including the full text of both the original UNFCCC and the Kyoto Protocol.

Climate Change Training Program (Climate Change:TRAIN) The United Nations Institute for Training and Research developed the Climate Change:TRAIN to help developing countries implement the UNFCCC. Climate Change:TRAIN offers training to researchers and officials from developing countries and provides technical support and guidance on climate change.

The Climate Institute, which has become the leading international NGO of scientists and policy leaders concerned with climate change and protection of the stratospheric ozone layer, has organized conferences, symposia, and ministerial briefings in thirty nations. It coordinated a team of sixty experts that developed national studies of vulnerability to climate change and potential response options in eight Asian countries - Bangladesh, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka and Viet Nam. These studies provided the focus for a 1995 Manila Asia Pacific Leaders Conference on Climate Change hosted by Philippine President Fidel Ramos. Working through the US Country Studies Program the Institute has worked with the Egyptian Environmental Affairs Agency in developing a climate change country study of Egypt and convening a national workshop on climate change which was held in March 1996 in Cairo.

U.S. Department of Energy (DOE) DOE is a leading science and technology agency whose research supports the US energy security, national security, environmental quality, and contributes to a better quality of life for all Americans.

Energy Information Administration's (EIA) Voluntary Reporting of Greenhouse Gases Program This voluntary reporting program, created under Section 1605(b) of the Energy Policy Act of 1992,

allows any organization or individual to establish a public record of greenhouse gas emissions, reductions, or sequestration achievements in a national database. Reporters gain recognition for environmental stewardship, demonstrate support for voluntary approaches, support information exchange, and inform the public debate over greenhouse gas emissions.

European Network for Research in Global Change (ENRICH) ENRICH, sponsored by the European Commission, is a network of climate scientists and research programs designed to promote cooperation on global change research. ENRICH's objectives are to foster collaboration and promote support for global change research in Western Europe, Central and Eastern Europe, NIS, Africa, and other developing countries; to promote a pan-European contribution to the international global change research programs; and to improve information exchange between researchers.

Global Change Data and Information System (GCDIS) GCDIS is a collection of distributed information systems operated by government agencies involved in global change research.

Greenhouse Gas Technology Verification Center The Greenhouse Gas Technology Verification Center is an independent testing organization (sponsored in part by USEPA) with a mission to provide a credible third-party verification capability to vendors, buyers, and other stakeholders that need reliable GHG technology performance data.

Intergovernmental Panel on Climate Change (IPCC) The IPCC was created jointly by the World Meteorological Organization and the United Nations Environment Programme in 1988. The IPCC is responsible for compiling and synthesizing the growing body of scientific literature on climate change. The comprehensive assessments of IPCC form the scientific basis for climate change policies.

International Energy Agency (IEA) Greenhouse Gas Research and Development Programme IEA is a private organization funded by a number of governments and industries. IEA provides general information about climate change and its causes, as well as papers on reducing greenhouse gas emissions and newsletter updates.

The National Institute for Global Environmental Change (NIGEC) is a funded activity of the U.S. Department of Energy. Since the Institute's inception in 1990, its mission has been to assist the US in its response to human-induced influence on the environment by pursuing high quality research in the field of global climate change. The primary goal of NIGEC is research directed toward: improving scientific understanding of the mechanisms of global environmental and climate change; reducing uncertainties surrounding key scientific environmental and climate change issues; creating innovative experimental or observation programs to enhance the understanding of regional scale, or ecosystem scale, processes contributing to global change; improving decision-making tools that are appropriate for the global environmental and climate change issues; building education and training opportunities to increase the flow of talented young people into global environmental change research areas; and focusing contributions to the public education on the subject of global climate change

The Oak Ridge National Laboratory (ORNL) Center for Global Environmental Studies The ORNL Center provides a base for exploring global issues beyond the boundaries of traditional research disciplines. Since the early 1960s, ORNL has integrated basic science and applied crosscutting science and technology expertise to develop interdisciplinary approaches to understand global systems sciences. The Center encourages collaborations between scientists and engineers, and

works in cooperation with other research institutions worldwide to advance the understanding of global environmental processes--in air, on land, and in water, anticipate how human actions will affect and be affected by the global environment, and identify and assess technology and policy options that can address global environmental concerns.

Worldwatch Institute Worldwatch is a nonprofit public policy research organization dedicated to informing policymakers and the public about emerging global problems and trends and the complex links between the world economy and its environmental support systems.

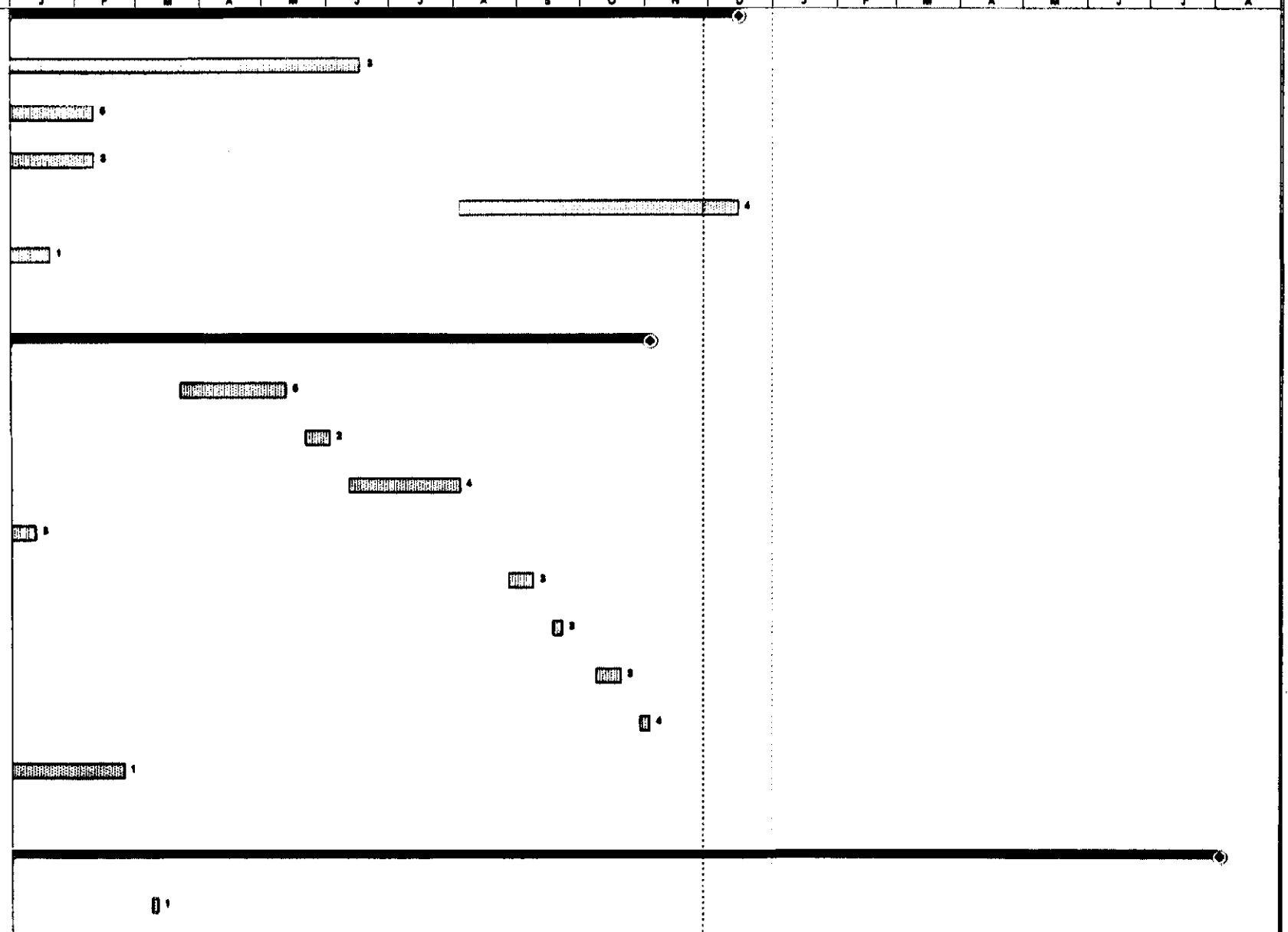
TRAINING PROGRAMS	Duration of Course	No. of Instructors
PROGRAM FOR OFFICERS TRAINEES	***252 days***	***16***
IAS Professional Course Phase-1 (1999-2001 Batch)	24.4 wks	3
67th Foundation Course (Main)	6 wks	5
IAS Professional Course Phase - II (1998-2000 Batch)	6 wks	3
68th Foundation Course (Main)	19.2 wks	4
IAS professional Course Phase-1 (2000-2002 Batch)	3 wks	1
PROGRAM FOR OFFICERS TRAINEES	***222 days***	***28***
83rd Induction Trg. Prog. For IAS Officers	7.6 wks	5
Trg. Program. For IAS Officers of 6-9 years of Service	2 wks	2
84th Induction Trg. Program for IAS Officers (IB)	8 wks	4
21st Trg. Program for IAS Officers of 10-16 years service (Main)	2 wks	3
10th Trg. Prog. For IAS Officers of 10-16 years Service (IB)	2 wks	3
Ethical Issues in Today's Administration (Main)	1 wk	3
11 th Trg. Prog. For IAS Officers of 10-16 years service (IB)	2 wks	3
Ethical Issues in Today's Administration (Main)	1 wk	4
85th Induction Trg. Prog. For IAS Officers (IB)	8 wks	1
WORKSHOP AND SEMINARS	***417 days***	***27***
4th SAARC Consultation on Cooperative (Main)	3 days	1

Project: Project2
Date: Wed 11/29/00

Task
Split
Progress

LBSNAA Training Schedule

TRAINING PROGRAMS	Duration of Course	No. of Instructors
PROGRAM FOR OFFICERS TRAINEES	***252 days***	***16***
IAS Professional Course Phase-1 (1999-2001 Batch)	24 4 wks	3
67th Foundation Course (Main)	6 wks	5
IAS Professional Course Phase - II (1998-2000 Batch)	6 wks	3
68th Foundation Course (Main)	19 2 wks	4
IAS professional Course Phase-1 (2000-2002 Batch)	3 wks	1
PROGRAM FOR OFFICERS TRAINEES	***222 days***	***20***
83rd Induction Trg. Prog. For IAS Officers	7 6 wks	5
Trg. Program. For IAS Officers of 8-9 years of Service	2 wks	2
84th Induction Trg. Program for IAS Officers (IB)	8 wks	4
21st Trg. Program for IAS Officers of 10-16 years service (Main)	2 wks	3
10th Trg. Prog. For IAS Officers of 10-16 years Service (IB)	2 wks	3
Ethical Issues in Today's Administration (Main)	1 wk	3
11 th Trg. Prog. For IAS Officers of 10-16 years service (IB)	2 wks	3
Ethical Issues in Today's Administration (Main)	1 wk	4
85th Induction Trg. Prog. For IAS Officers (IB)	8 wks	1
WORKSHOP AND SEMINARS	***417 days***	27
4th SAARC Consultation on Cooperative (Main)	3 days	1



Project: Project2
Date: Wed 11/29/00

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary | External Milestone | Deadline

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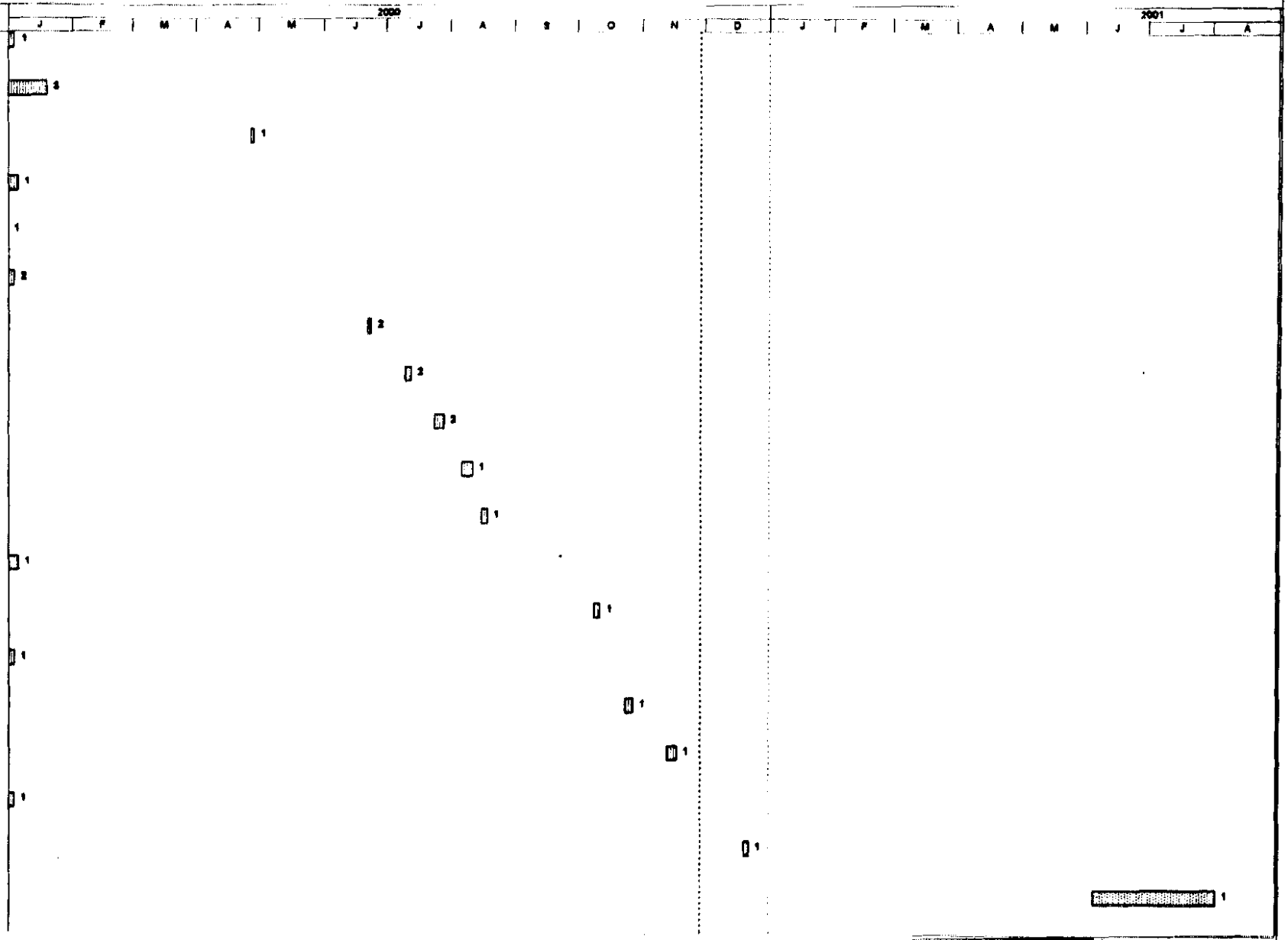
LBSNAA Training Schedule

TRAINING PROGRAMS	Duration of Course	No. of Instructors
Workshop for Additional Register of Co-operative Societies	3 days	1
Public Mgmt. & Poverty Reduction in a Market Economy	3 wks	3
Workshop for Relief Comm. (Main)	2 days	1
Thematic Workshop on Literacy and Continuing Education	5 days	1
Workshop for Directors of ATI & Faculties of Disaster	2 days	1
Workshop on Population, Dev. & Reprod. Health Issues	3 days	2
Retreat of the 1950 Batch (Main)	2 days	2
Orientation Program for the Members of National Commission	3 days	2
DTS Course (National Level) for DoPT (Main)	5 days	2
Training of Trainers Module on Human Rights (Main)	5 days	1
Management of Rural Employment Program	3 days	1
TOT Program on TQM (Main)	5 days	1
Workshop on Population (UNFPA Workshop) (NSDART)	3 days	1
Thematic Workshop on Literacy and Continuing Education	3 days	1
Seminar on Good Governance	4 days	1
Training of Trainer Module on Human Rights	5 days	1
SAARC Social Sector Program	3 days	1
Thematic Workshop on Literacy and Continuing Education	3 days	1
IAS Professional Course Phase-II (1999-2001 Batch)	43 days	1



Project Planned
Date: Wed 11/29/00

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary | External Milestone | Deadline

ANNEX D: LETTER TO MR. S. KRISHNAN