Annual Report 2013-2014

Integrated Research and
IRADe Action for Development

ANNUAL REPORT 2013-2014
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OVERVIEW

Background

IRADe is an autonomous advanced research institute, which aims to conduct research and policy analysis to connect disparate stakeholders such as government, non-governmental organizations, corporations, academia and financial institutions. Since sustainability, climate change, renewable energy, energy efficiency, urban development, poverty, gender equity, agriculture and food security, are considered challenges for the twenty-first century, its research covers these, as well as policies that affect them. Its focus is effective action through multi-disciplinary and multi-stakeholder research to arrive at implementable solutions for sustainable development; and policy research that accounts for the effective governance of techno-economic and socio-cultural issues.

IRADe was established under the Society's Act, in 2002 at New Delhi. It is certified as a Research and Development organization by the Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology (MoST). It has also been selected as a Centre of Excellence by the Ministry of Urban Development (MoUD) for Cities and Climate Adaptation. In addition, it provides expertise to other ministries and institutions from time to time.

Thematic areas

- Energy and Power System (EPS)
- Urban Infrastructure and Services (UIS)
- Climate Change and Environment (CCE)
- Poverty Alleviation and Gender (PAG)
- Agriculture and Food Security (AFS)

Key activities

- Research and Analysis for Decision Support (RAD)
- Research in Action, Monitoring and Evaluation projects (AME)
- Training and Capacity Building (TCB)
- Policy Advocacy and Dissemination (PAD)

IRADe's objectives

- To develop an understanding that integrates multi-stakeholder perspectives concerning issues of development.
- To promote wider consensus, through research and analysis, on effective policies among stakeholders and policy makers.
- To build capacities among professionals for multi-disciplinary, multi-stakeholder policy analysis.
- To promote ideas and initiatives for inclusive development at local and global levels.
- To promote research support to developing countries for development and also to negotiate international agreements better.

Current Governing Council

Dr. Kirit S. Parikh (Chairman)	Economist and Engineer
Prof. Jyoti K. Parikh (Member Secretary)	Specialist, Energy and Environment
Ms. Ela Bhatt	Founder, SEWA
Dr. R.A. Mashelkar	Former Director General, CSIR
Mr. Keshub Mahindra	Industrialist
Prof. Deepak Nayyar	Former Vice Chancellor, University of Delhi
Ms. Meera Shankar	Former Ambassador, Govt. Of India

+ Appointed in 2013 after the resignation of Dr. Rakesh Mohan, former Deputy Governor, Reserve Bank of India

Founding Members

Dr. Kirit S. Parikh (Chairman)	Economist and Engineer
Dr. Manmohan Singh	Member, Rajya Sabha +
Ms. Ela Bhatt	Founder, SEWA
Mr. Adi Godrej	Industrialist #
Mr. Keshub Mahindra	Industrialist
Dr. R.A. Mashelkar	Director General, CSIR
Mr. Shirish Patel	Consulting Engineer
Prof. Jyoti K. Parikh (Member Secretary)	Specialist: Energy and Environment

Resigned after the first term
+ At the time of IRADe registration in 2002

International Advisory Board

Mr. Nitin Desai	Former Under Secretary General, United Nations
Prof. Amartya Sen	Harvard University
Prof. Gustav Speth	Yale University
Sir Nicolas Stern	UK Treasury
Prof. Joseph Stiglitz	Columbia University

PREFACE

It is my great pleasure to present the 2013-2014 Annual Report of the activities of IRADe. This Annual Report provides an opportunity to reflect on the significance of research and development that makes an impact on economic growth and sustainable development.

We completed several influential projects such as "CDMP Review of Six Cities", "Climate Resilient Urban Development: Vulnerability Profiles of 20 Indian Cities" and various other projects. Detailed overviews of projects are mentioned in this report. The organization has taken up several new research projects such as Environmentally Sustainable and Integrated Energy Strategy for Gujarat State and many other during the year, which are sponsored by national and international agencies and government organizations. We also provided research support to various institutions and government bodies. We will continue to build on this to raise the level of our achievements.

We have reached several other milestones that have been achieved this year. We completed the study titled, "Low Carbon Development Pathways for Sustainable India", which was supported by the *World Wildlife Fund (WWF)*. *Sir Dorabji Tata Trust (SDTT)* awarded the project titled "Analysis of Factors Affecting Agricultural Productivity in the Flood Plains of Eastern Uttar Pradesh to Synergize SDTT Investments in the Region" to IRADe. Under this project, IRADe will analyze factors affecting productivity in the operational districts. The project would take a comprehensive multi-disciplinary approach in improving livelihoods in the areas where economic productivity is low but has high potential.

I take this opportunity to express my sincere thanks to all our sponsors, well-wishers and Governing Council of IRADe for their continued support and encouragement. I express my sincere appreciation to the IRADe team and thank them for their cooperation and devotion to work.

Jyoti K. Parikh

Professor Jyoti Parikh
Executive Director

1 CLIMATE CHANGE AND THE ENVIRONMENT

1.1 Vulnerability of Coastal Cities on rivers to Climate Change: Case Study of Surat to Develop Adaptation Framework

The objectives of the study are to develop an integrated analytical framework for urban areas in the background of a specific case study of Surat city; to assess the vulnerability of the city and its people to climate change, and to develop a procedure to incorporate climate change concerns in the existing framework for decision support system. It will decide on adaptation actions that can make a city resilient to climate change induced vulnerability.

The study measures the physical, economic and social impacts of selected extreme weather events of flooding; identifies the public and private responses in the short to medium-term and explores their policy implications for long-term adaptation capacity, city resilience and development plans. This study is based on the analysis of primary and secondary data pertaining to the selected events of flooding and their resultant physical, economic and social impacts. The case study of Surat also identifies the immediate to medium-term post disaster responses of the civic administrations, concerned authorities as well as the citizens to cope with future floods.

To understand the vulnerability of the socio-economic sectors like schools, hospital, slums and industry, vulnerability index for each sector is constructed. IRADe has developed flood vulnerability index map based on the data collected using primary survey from the selected samples for the specific parameters pertaining to each sectors.

To do the quantitative assessment of vulnerability, an index based approach is adopted. An index is constructed based on several set of indicators that result in vulnerability of the sector. It produces a single number index, which can be used for vulnerability analysis for different units located at different areas in the city. This index can be used for fixing priorities for the vulnerable areas, identification of adaptation interventions in policy and planning process.

Significance of Flooding and Inundation to Surat city

City of Surat, located on River Tapi, lies in the flood plain and in an estuarial region. City has a number of creeks in south-west part. Surat has been historically susceptible to flooding-both risk exposure and vulnerability have increased over the past few decades. Surat has witnessed three major floods in the 20th century (1968, 1994 and 1998) and recently in 2006. The 2006 flood was the biggest in the last 34 years after the construction of the Ukai Dam in 1971. 2006 devastating flood covered almost the entire city and more than 75% population was affected.

Surat city has a distinctive characteristic of being close to the sea at the western side and an intruding river which shapes the whole city. Sea-level rise is another major risk that the city faces. Being located at <13m AMSL and 15km from the coast, even a 1m sea-level rise can impact western parts of the city, the area under high tide zone.

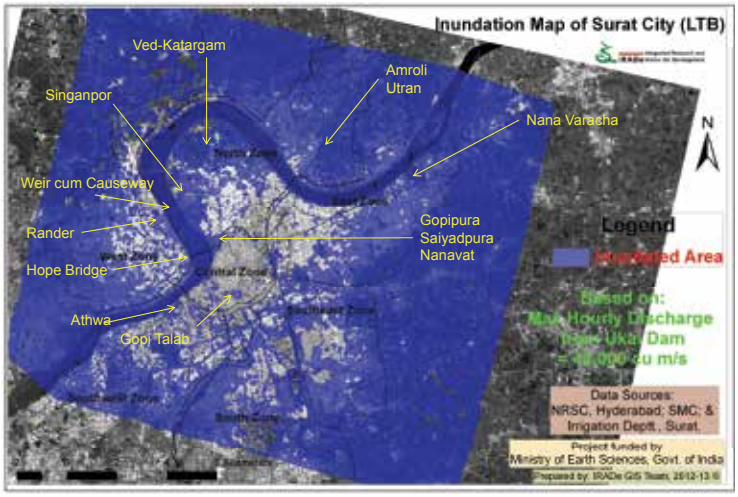
The spatial extension of the assessment of the project is limited to city of Surat. The study area is determined based on the population and infrastructure threat perception due to the floods. Flood plain mapping is performed using the water surface elevations on the cross-section cut lines, within the limits of the bounding polygon. The process of floodplain mapping is based on the hydraulic calculations of water surface elevations extracted from the CARTOSAT Imagery of the region of 2.5m resolution. Meteorological input is used with the hydrologic model of the lower Tapi basin mainly comprising of Surat city to generate flow input data for hydraulic modeling. Three water discharge scenarios are selected to represent the range of potential impacts that varying discharge will have on the basin.

Some highlights:

o Submerged regions are:

- Low lying areas like Ved Road, Katargam, Singhanpore, Kadar Shah naal, etc.
- Adjoining regions of Weir-cum-Causeway due to overflow.
- Adjoining regions of Nehru Bridge at Chowk Bazaar.
- Areas along the bridges and the river ghats are always at a threat of rising water level due to discharge from UKAI dam.
- Creeks like Kakra, Bhedwad, Mithi, Bhatena and Simada overflow due to excessive water discharge from Ukai dam and heavy rainfall in the catchment areas.

There is a likelihood of increased frequency of urban flooding, both fluvial (river induced) and pluvial (local rain induced) flooding due to increase in extreme rainfall events. Moreover, heavy rainfall in other places might cause flooding downstream as a result of water release from water reservoirs upstream, as experienced in Surat in 2006. This flooding is exacerbated in almost all the cities because of the pattern of development - riverfront development projects where land was reclaimed land and river channels reduced (as experienced in Ahmedabad), construction on small creeks and rivulets (as experienced in Surat), severe loss of tree cover, and also increase in area of hard paving.



The existing infrastructure available in the cities are unable to cope up with the growing population pressure and are becoming more stretched and untenable with the expansion of the city limit areas. The local bodies like municipal corporations today are under tremendous pressure with the growth of industries and service sectors. For example, Surat has expanded its city limit areas in 2006 from 112 sq km to 326 sq km putting Surat Municipal Corporation (SMC) under tremendous pressure. The expanded city limits too have to heavily depend on the city heartland to meet its basic infrastructure needs.

This project is supported by the Ministry of Earth Sciences (MoES), Government of India, New Delhi.

1.2 Study on Economy-wide Model for Low Carbon Strategy

This study has been funded by the Planning Commission to support the work of low carbon expert group. The Expert Group on Low Carbon Strategies for Inclusive Growth (2011) appointed by Planning Commission in its interim report provides low carbon technology alternatives for key energy intensive sectors in India. But the assessment of these technologies at macroeconomic level is not done. Study of cost considerations, impact on growth rate, and impact on carbon emissions, energy intensity and emissions intensity are required to be done to make a careful choice among the available alternatives for India.

IRADe used its energy economy model to present two scenarios

1) The Baseline inclusive growth scenario (BIG)
2) Low carbon inclusive growth scenario (LCIG)

The BIG scenario had inclusive development policies along with baseline technological assumptions. The inclusive development policies include cash transfers to 60% of rural population and 50% of urban population. The cash transfers are used to finance minimum access of electricity and LPG consumption of poor households. It also includes government providing housing facilities to all through Indira Awas Yojana and Rajiv Awas Yojana. The cost of the inclusive policies is assumed to be borne by the government from its resources by sacrificing investment.

The low carbon inclusive development scenario incorporates low carbon policies directed at reducing CO_2 emissions over and above the BIG scenario. The scenario showed an 18% share of renewable in power generation and 33% of power generation coming from non fossil sources. The scenario also envisioned the share of railways in freight transport reaching 50% by reducing the share of road transport in it and a shift from oil based road transportation to electricity and gas based road transportation. In addition, higher efficiency was assumed on the demand side to reduce energy consumption. Higher efficiency was assumed for household consumptions of petroleum products and electricity. Higher efficiency was also assumed through Autonomous Energy Efficiency Increment (AEEI) for different production sectors. However it was assumed that such higher efficiency won't be costless and that every rupee of energy saved would require equal amount of investment with a 5 year payback period.

The results showed that attaining low carbon path has economic costs other than direct impact of higher energy system cost. The GDP growth rate decreased from 7.03% to 6.87%. The higher investment in energy sector, in a resource constrained economy like India, would result in reducing investible resources for the non energy sectors and hence would result in lower trajectory of economic growth. The CO_2 intensity fell by 22% from 2007 to 2030 in the BIG scenario. This fall in CO_2 intensity was 42% in the LCIG scenario. The emissions of CO_2 gases reduced from 5.2 billion tonnes in BIG scenario to 3.8 billion tonnes in the LCIG scenario. The per capita CO_2 emissions reduce from 3.6 to 2.6 tonnes per person in LCIG scenario compared to BIG scenario. The IRADe model put the cost of pursuing a low carbon pathway at 8.37 billion US$ (2011 prices) from 2011 to 2030. However if the discounted value of GDP losses is also added to the cost then the total cost to the economy would be about 1 trillion US$ at 2011 prices.

IRADe also separately conducted a study to project the growth in the appliance possession by households up to 2030 and the amount of energy savings that would be achieved. The result of the study was used in the report of the low carbon expert group.

This project is supported by the Planning Commission, Government of India, New Delhi.

1.3 Socio Economic Vulnerability of Himachal Pradesh to Climate Change

The state of Himachal Pradesh is particularly vulnerable to climate change due to its geo-ecological fragility and its potential for rapid economic development. The study is targeted at producing a consolidated report containing, local socio-economic and ecological conditions, climate variability and trends, perceived changes and impacts especially in terms of livelihood of the local people. The study will also explore the coping mechanisms and strategies including a climate change adaptation plan.

This study employs a mixed method (both qualitative and quantitative) to explore multiple aspects of the issue

covered in the study. The study will be carried out using both primary and secondary data sources using different methods including structured questionnaire, interviews, literature review and field observations.

This project is supported by the Ministry of Science and Technology, Government of India, New Delhi.

1.4 Critical Evaluation of the 12th Five-Year Plan from a Climatic Perspective

The Twelfth Plan (GOI 2012) focuses on faster, more inclusive and sustainable growth. It emphasizes the need for reversing the currently observed deceleration through investment in major sectors. The Plan states that 'No development process can afford to neglect the environmental consequences of economic activity, or allow unsustainable depletion and deterioration of natural resources'.

IRADe critically evaluated the Twelfth Plan documents to answer the following:

- What are the essential features of the five-year plan?
- What climate aspects are there related to various sectors?
- How does a plan evolve and where are the entry points for introducing climate at each step?
- What are the other policies and programmes that plan relies on?
- What is the role of the state government?
- How to evaluate a climate centred plan in future?

This project is supported by ICRIER "The New Climate Economy Project".

1.5 Assessing Socio Economic Vulnerability to Climate Change: A Case Study of Assam

Assam is situated in the sub-tropical zone lying between 24^0 8^l N and 27^0 9^l N latitude and 89^0 42^lE and 96^0 10^lE longitude. Assam is surrounded by six of the seven sister north eastern states of India and it also shares international border with Bhutan and Bangladesh. A narrow strip of about 25 km links the State with West Bengal. This study aims to assess vulnerability to climate change for the state of Assam and its socio-economic implications on the sectors such as agriculture, water and forestry in the state.

Key Findings

Regional survey reveals that Nagaon and Sonitpur are the worst floods affected districts of Assam. IRADe conducted a primary survey and focus group discussions with the help of local NGO that covered 100 households in 3 villages of Nagaon and 3 villages of Sonitpur district.

The study depicts the adverse impacts of climate change due to high dependence of the majority of people on climate-sensitive sectors, such as agriculture, water, forestry and fisheries. Assam being an agrarian economy, flood leads to huge losses in agricultural production and income of the poor farmer's.

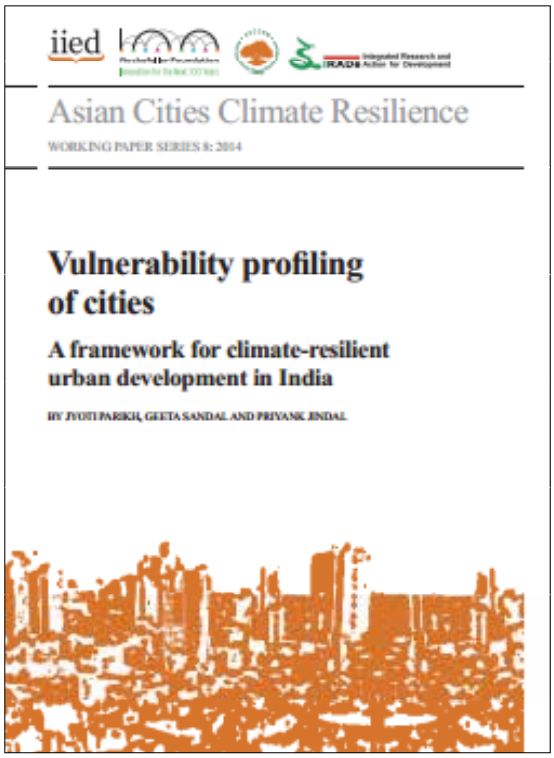
Women in Assam are more vulnerable to climate change because change because of their role, responsibilities and socio-economic status in the society. Women have to go out to collect fuel wood and also engage in agriculture activities which inflicts an extra suffering to them.

The study is supported by the Indian Council of Social Science Research, (Ministry of Human Resource Development), New Delhi.

2 URBAN INFRASTRUCTURE AND SERVICES

2.1 Vulnerability Profiling of Cities – A Framework for Climate Resilient Urban Development in India

IRADe developed a working paper on the Hazards – Infrastructure - Governance – Socio-economics (HIGS) framework for Rapid Vulnerability Analysis (RVA) of cities, in order to inculcate the methodology into the public domain. The working paper will help policy makers, urban planners, city administrators, experts, academicians, students and aid agencies to appreciate issues regarding urban climate vulnerability and help them to deal with climate related impacts and formulate adaptation strategies. The aim of this study was to present HIGS framework as a customized and holistic approach that can be used for rapid assessment of climate vulnerability and sustainability of cities.



Objectives of the study:

- To highlight the links between climate change and cities.
- To discuss concerns focusing on issues pertaining to cities and their approaches to climate resilience.
- To develop climate informed urban development interventions while understanding the urban systems at risk.
- To scale-up climate informed development interventions for customized and coherent framework, which is needed for climate resilient urbanization.
- To provide planners, decision makers and other relevant stakeholders with a theoretically as well as methodologically well- grounded framework to use for other cities.

The work has been published as a working paper. The framework prepared will facilitate an understanding of likely future climate impacts while assessing the resilience of the current socio-economical system in the face of numerous stresses that are partly related to climate impacts and partly due to fragilities in the system itself.

The project is supported by International Institute for Environment and Development (IIED)

2.2 A Policy Brief on Emerging Mechanisms and Responses of Cities to Climate-ACCCRN

IRADe prepared a policy brief to explore various aspects influencing the vulnerability of the cities based on IRADe framework and approaches. The policy brief highlights IRADe's approach that is rooted in the observation that similar climate events can produce very different levels of socio-economic impacts, depending not only on the location and timing of the occurrence, but also the resources and agility of the societies to respond to climate impacts. The working paper was presented at National Conference on Emerging Mechanisms and Responses of Cities to Climate Change held in New Delhi on December 10th 2013.

Objectives:

- To reorient urban development programmes to address convergence points and facilitate climate resilience at city levels
- Dissemination of knowledge and lessons learnt from the cities to the national level, thereby, informing city governments of opportunities available at that level
- Highlight the policy structure and decision-making needed at the national, state and city level.

The policy brief provides evidence that cities can use a combination of key institutions, enabling policies and financing options to allow sustainable and climate resilient urbanization of India's growing cities. It also provides recommendations for prioritizing climate resilience measures in urban development programmes and policies.

The project is supported by TARU Leading Edge Pvt. Ltd.

2.3 City Disaster Management Plan: A Review of Six Cities

IRADe reviewed the City Disaster Management Plan (CDMP) of the 6 cities (Bhubaneswar, Gangtok, Madurai, Trivandrum, Shimla, and Vijayawada) with a view to assess the clarity, comprehensiveness, efficiency, appropriateness, and dissemination of disaster management measures as part of city disaster management plan. This also includes the integration of climate risk management measures in the CDMP planning process and plan document. IRADe has made specific recommendations and presented strategies to each city administration on addressing gaps established during the review process to update the existing CDMP. Two sets of questionnaires were developed by the IRADe team, to review the CDMP document. A field visit was also conducted by an expert to gather the views of various stakeholders involved in CDMP preparation process and otherwise as well.

These six cities have made progress in disaster risk management while making efforts to prepare city disaster management plan.

The objective was to review the city disaster management plans and provide a guidebook that would facilitate the administration at city level and the concerned stakeholders for preparedness, planning and prevention of disasters along with the relief, rehabilitation and reconstruction.

This also includes the integration of climate risk management measures in the CDMP planning process and plan document to understand the institutional systems and process of preparing a productive CDMP.

The project was completed after visiting six cities and consulting relevant stakeholders in each city. Analytical

report for CDMP review of six city disaster management plans was prepared. It was suggested that the process of making CDMP should be consultative involving many stakeholders, local bodies etc., whose list should be prepared beforehand. A list of issues was also given. After preparing draft plan, ward representatives should be also called to discuss individual wards problems, if any.

The project is supported by United Nations Development Programme (UNDP)

2.4 Sustainable and Disaster Resilient Urban Development

IRADe is conducting a study with the Ministry of Urban Development for providing capacity building support for sustainable and disaster resilient urban development. As part of this project, 10 cities will be covered from different regions of the country which are as follows:

a. East India- Shillong, Bhubaneswar, Guwahati
b. West India- Pune, Ahmedabad
c. South India- Vishakhapatnam, Hyderabad
d. Central India- Bhopal
e. North India- Dehradun, Srinagar

Objectives of the study:

- To address hazards and risks effectively.
- To get the insights on decision support at city levels and coordination with administrative bodies such as municipal corporations, urban development authorities; and other parastatal agencies and think tanks.
- To sequence activities in the context of the city's financial capacities in term of JnNURM investments and also reflect the priority investment area towards achieving sustainable and disaster resilient urban development.
- To highlight the technical capacities, and planning cycles and political/cultural environments at the cities to build disaster resilience.

Progress made so far:

Six cities viz Shillong, Guwahati, Dehradun, Bhopal, Pune and Ahmedabad have been covered so far through city visits and stakeholder consultations. The research study is done based on the literature review and data collected from the cities' ULBs like Municipal Corporation, Ministry of Urban Development, Disaster Management cell and institutions working in the concerned field. The existing planning instruments like city development plans, state/national disaster policies and disaster management plans were reviewed as well.

Four regional workshops will be conducted for city specific capacity building, knowledge dissemination as well as stakeholder engagement.

The project is supported by the Ministry of Urban Development, Government of India

3 ENERGY AND POWER SYSTEM

3.1 Environmentally Sustainable and Integrated Energy Strategy for Gujarat State

IRADe has been awarded the work of preparing an "Environmentally Sustainable and Integrated Energy Strategy policy document for Gujarat State" by the Government of Gujarat.

Background

Gujarat state economy has been developing at a rapid pace since last two decades. This growth has been sustained by planned development of power and energy sector to meet the emerging demand in each development sector. Gujarat also has multiple ports with required facilities to import energy resources to serve the local and national demand. Gujarat government has created institutions and organizations that can develop energy resource harnessing infrastructure, power generation, transmission and distribution system to serve the end users and consumers.

These facilities though meet our current and near term requirements, long term options need to be analysed and developed.

An integrated long term planning for power and energy to sustain reliable supply is essential for sustainable planned socio-economic growth. The new energy policy will address various challenges envisaged for sustainable development. While formulating these policies an integrated approach with positive linkages between energy and environment will be worked out.

Major challenges concerning Gujarat

Enhanced pace of industrialization all over the state, rapid urbanization and buoyant agriculture has been possible by providing electricity/energy for development needs. Further growth of industries, transport, infrastructure and agro-sector performance, development of large infrastructure projects like SEZ's, DMIC, are some of the major projects and sectors that would challenge and demand energy needs going forward.

The energy needs will depend upon social structure, geographical features, State GDP, percapita income, availability of fuel mix, fuel pricing, fuel imports, etc., based on these, sectoral distribution of energy demand will change over the coming decades. The present study would account for this dynamic development process for the state of Gujarat and present various scenarios for an optimized energy planning process for coming two decades.

Project Outline and Outcomes

The project will basically address various issues pertaining to development such as: Socio-economic scene of the state, Energy and environmental profile of the state, Challenges faced in both these sectors, Opportunities at a glance in energy efficiency, Energy imports through ports, energy conservation, uninterrupted power & energy supply to consumers at affordable cost, carbon emissions, infrastructure needed to sustain power supply, export potential of surplus energy. Current energy scene and demand projections for next two decades would also be worked out.

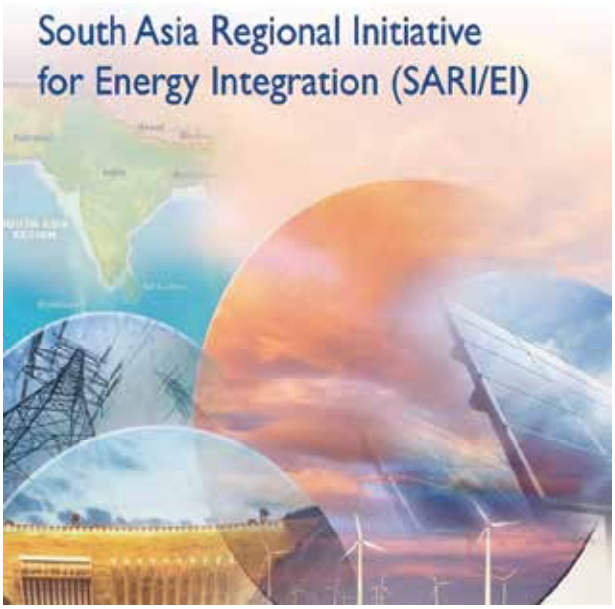
Based on the above analysis, suitable policy options and initiatives for Energy Security for the state would be prepared.

Project Progress

Analysis of electricity (conventional and renewable) and fossil fuel sectors have been completed, rest of the deliverables are under completion, building up of energy demand scenarios is in progress. BAU, high growth, low growth, energy efficiency and other scenarios are being developed to get an optimized scenario for the state.

3.2 South Asian Regional Initiative for Energy Integration (SARI/ EI)

Over the last two decades South Asia has been one of the fastest growing regions in the world, with an average annual growth rate of 6% as measured by GDP per capita. Yet despite this impressive macroeconomic growth, the energy sector in the region has not been able to keep pace, and continues to experience chronic problems of shortage of electricity supply and poor quality of service. South Asia's energy security dilemma is one of the signals of energy development challenges of the 21st century critical to the economic future of almost 1.5 billion people and the political future of one of the world's most volatile regions. Given this dilemma the only long-term solution is the sustained increase in regional energy cooperation among South Asian nations. South Asia Regional Initiative/Energy's (SARI/E) role over the past decade in advocating energy cooperation in South Asia has transited to the next phase of advancing regional energy integration and Cross-Border Energy Trade in eight South Asian Countries (Afghanistan, Bangladesh, Bhutan, India, Pakistan, Nepal, Sri Lanka & Maldives). This fourth and the final phase titled South Asia Regional Initiative for Energy Integration (SARI/EI) is designed to build upon SARI/Energy's successful initiatives of the past to move South Asian countries towards increased regional energy security.



Integrated Research and Action for Development (IRADe) has been selected by U.S. Agency for International Development for the implementation of the South Asia Regional Initiative for Energy Integration (SARI/EI) program. During this five year program (2012-2017), IRADe & USAID will work together to promote integration of energy systems and enhance Cross-Border Energy Trade (CBET) among the participating South Asian countries.

The main objective of the SARI/EI program is to "Promote integration of Energy Systems and enhance Cross-Border Electricity Trade (CBET) among the South Asian countries by focusing on the following three development outcomes for overall socio-economic development of the region through three Task Forces:

3.2.1 Task Force 1 on "Coordination of Policy, Legal and Regulatory Framework"

The key result of the coordination of policy, legal and regulatory framework component is to create the enabling systemic conditions for a sustainable market for investment and implementation of Cross-Border Electricity Trade.

The 1st Meeting of Task Force - 1 on "Coordination of Policy, Legal and Regulatory Framework" of SARI/EI Program was held from 24th - 25th July, 2013 at Dhaka, Bangladesh. 'The members deliberated on the policy, legal and regulatory issues with respect to Cross-Border Electricity Trade. The Task Force Working methodology and Terms of Reference were discussed and accepted.

The primary focus of the meeting was on the issues relating to investments as well as on creating a conducive policy and regulatory environment to address the infrastructural aspects of Cross-Border Electricity Trade. It was proposed to identify and analyse the various aspects/provisions contained in the country laws, policies & regulations and to suggest recommendations for the harmonization/coordination of policy, legal & regulatory issues to facilitate Cross-Border Electricity Trade in the region.

The 2nd Meeting of Task Force 1 on "Coordination of Policy, Legal and Regulatory framework" of SARI/EI was organized on 19th-20th February, 2014 at Colombo, Sri Lanka.

Summary of the 2nd meeting of Task Force 1 are as follows:

- Currently, focus is on bilateral as well as on case to case basis. Specific provisions in electricity laws in the long term are extremely important and will provide a conducive environment to advance energy integration in the South Asian region.
- Trading Licenses are required for smooth and legally tenable CBET. However, generation may be de-licensed to promote capacity addition vis-à-vis CBET.
- Non-Discriminatory open access is extremely important for enhancing private sector participation. It is important for creating regulatory regime to grant open access.
- For long term sustainability, overall tariff must reflect true cost of generation and tariff must be fixed by independent regulators.
- If subsidies are required for customers it must be supported by adequate funding from the Government.
- For sustainability of Power sector, Sector reform is important to bring viability, transparency and accountability.
- Need to have independent dispute resolution body at regional level for the settlement of disputes.

During the meeting, a visit to the South Asia Regional Centre for Lighting (RCL) of Ceylon Electricity Board was organized on invitation by Honourable Mr. Upali Daranagama, Additional Secretary (Planning and Development), Ministry of Power and Energy, Government of Sri Lanka. In view of the widespread benefits expected through the introduction of efficient lighting, Regional Centre for Lighting (RCL) has been established within the Sri Lanka Sustainable Energy Authority (SLSEA) with the assistance from the South Asia Regional Initiative for Energy, funded by USAID.

3.2.2 Task Force 2 on "Advancement of Transmission Systems Interconnections"

The key result of the Advancement of Transmission Systems Interconnections component is to create enabling, systemic conditions for a sustainable market for investment and implementation of sub-regional bilateral transmission interconnections beginning with the eastern sub-region of South Asia.

Key Deliverables as per Terms of Reference of Task Force 2:

- Review the supply-demand scenario up to 2035.
- Review of Power Generation Capacity Addition Plan for infrastructure, availability and readiness of enabling institutions required to achieve planned outcomes in capacity addition up to the year 2035.
- Assess CBET opportunities in 25 – 30 years' time frame.
- Prepare Regional Electricity plan in 25-30 years' time frame in periods of 5 years based on National plans.
- Develop Standard Technical specifications of different voltage levels with parameters and list of codes to be prescribed for cross border requirements.
- Review open access and congestion management policies.
- Evolve transmission cost and loss sharing guidelines.
- Develop coordinated system operating procedures to be adopted for import export tie lines.

3.2.3 Task Force 3 on "South Asia Regional Electricity Markets"

The key result of this component on South Asia Regional Electricity Markets (SAEM) is to create the enabling and systemic conditions for a sustainable market for energy trading and exchange among the South Asian countries.

A regional energy trading market in the South Asia region is a key development challenge to advancing energy integration. Various analysis recognize the value of developments of power exchanges and related market mechanisms to enhance the bilateral and multilateral arrangements that are at the core of any cross-border electricity trading program. Such market mechanisms can also provide for more efficient exchanges of increments of power to better manage schedule deviations and take advantage of diversity of the hourly load profile of each trading nation. Market arrangement and prices should provide a level playing field and a useful benchmark for investors, generators and purchasers in the entire region.

3.2.4 South Asia Regional Inaugural Conference of SARI/EI on 'Cross-Border Electricity Trade'(October 4th-5th, 2013 | New Delhi, India)

The South Asia Regional Inaugural Conference of SARI/EI on 'Cross-Border Electricity Trade' was held on October 4th-5th, 2013 in New Delhi, India.

The conference launched the SARI/EI program to gain acceptance for its goals among the South Asian Countries. It also showcased the 'win-win' benefits offered by bilateral and multilateral electricity trade and to initiate a concrete and constructive discussion on the vision and road map for the South Asia Electricity Market. It also discussed the opportunities and challenges to increase Regional Electricity Cooperation in South Asia through Cross-Border Electricity Trade and to identify potential steps towards integration of power systems in South Asia. The workshop also deliberated on the development of coordination procedures from the perspective of the legal, policy and technical aspects of regional Cross-Border Electricity Trade (CBET) and to discuss on the role and strategic engagement of private sector in CBET.

Key Outcomes:

Policy and Regulations:

- Electricity to be recognized as trading commodity and policies related to pricing and subsidies need to be aligned in the context of CBET.
- Different countries follow different regulatory practices, which leads to difference is in electricity pricing in the region. This calls for need for harmonization and coordination.
- Review of respective electricity import and export policies by the participating nations for facilitating CBET.
- Distorted prices due to subsidies to sizable population of poor in the South Asia region can be a constraint for investments in power sector which impacts the scope of CBET, therefore needs to be reviewed.

- Need for advancing policy reforms at national level with special focus on taxation and duties.
- To establish guidelines for trade and dispute resolution mechanism as pre requisite for establishing energy market.

Regional power Grid and development of power exchanges:

- The grid codes and technical standards need to be coordinated to ensure reliable regional power system operation.
- Requirement of South Asia regional power grid and establishments of power exchange.
- Learning from the best practices from established international energy markets for establishment of SAEM.
- Formulating market rules for cross-country power transmission.

4 AGRICULTURE AND FOOD SECURITY

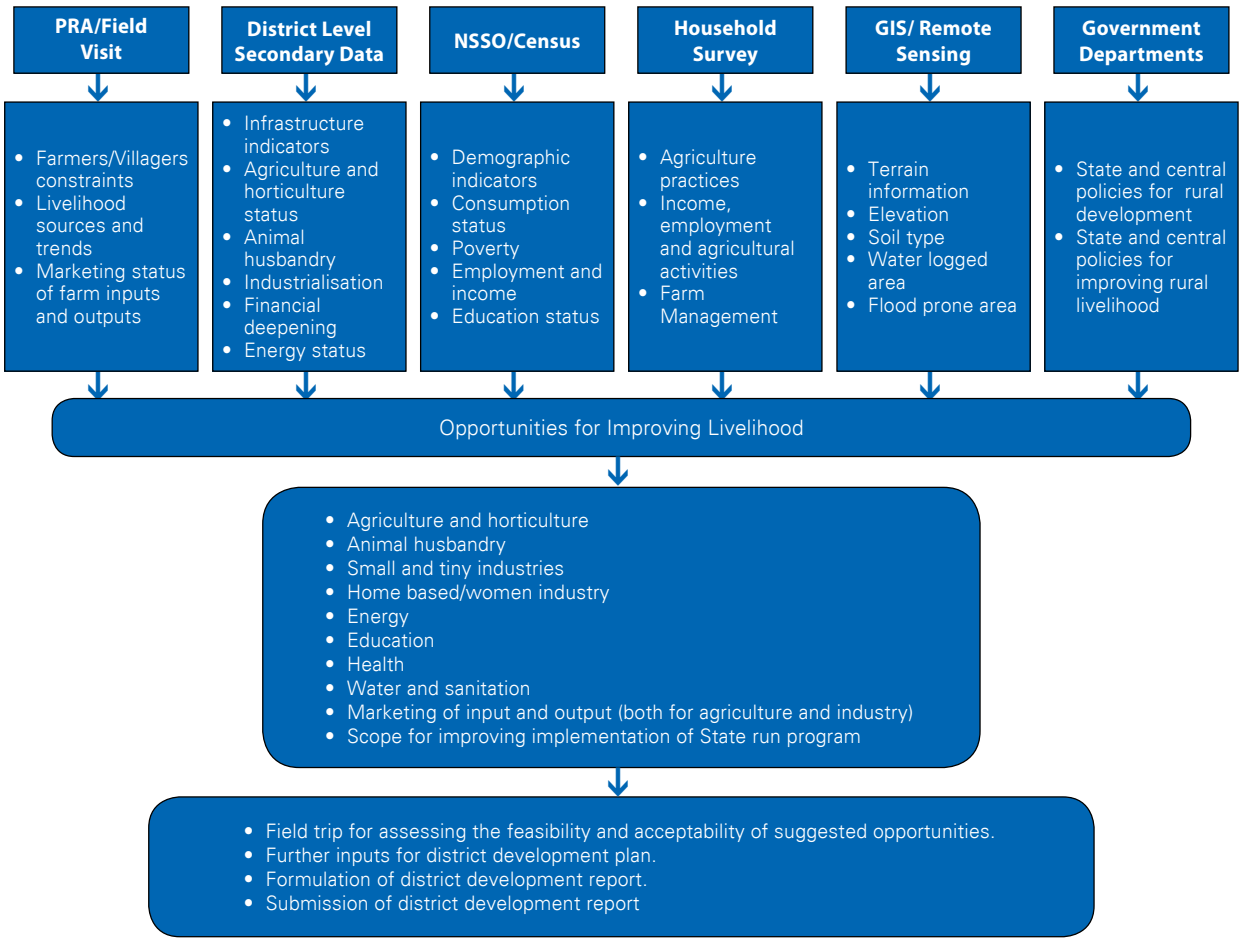
4.1 Analysis of Factors Affecting Agricultural Productivity in the Flood Plains of Eastern Uttar Pradesh to Synergize SDTT Investments in the Region

IRADe is carrying out an in-depth research and analysis to understand the constraints and opportunities for improving the agricultural productivity and rural livelihoods in districts where SDTT is operating. This will be done in the macroeconomic context at the district level. The outcome of this study will enable in identifying the required action for improving the agricultural productivity and rural livelihood as well as prioritization of these action. Given the resource availability of a particular district, IRADe will work out strategies in consultations with Government agencies, participating NGOs, farmers and other stakeholders for bringing convergence between various available Government schemes/programs and SDTT initiatives to improve the rural livelihoods.

Methodology:

A detailed methodology was planned to undertake district level data collection through various research tools like PRA, RRA, Schedules, Meetings, FGD's, etc. and the methodology frame work was prepared as presented in chart-A.

Chart A:↓



Progress of the Project:

In the first year of this project, IRADe had submitted "Bahraich District Plan for Improving Livelihood and Human Development". Brief observations from primary and secondary data for Bahraich district are as follows:

- The agricultural yields are by and large below their potential.
- The major constraint faced by farmers in the district are low access to scientific extension services, non-availability of timely and adequate supply of quality inputs such as seeds, fertilizers and fair price for agricultural produce due to low accessibility to markets.
- Non-availability of formal credit for small and marginal farmers is another area of concern.
- Irrigation with diesel driven pumps is expensive and farmers pay lot of money to their neighbours for irrigation service.
- Access to veterinary services like artificial insemination (AI) is also far from satisfactory in Bahraich district.
- Availability of off-farm employment is scarce in the district due to lack of industrialization. Health and sanitation situation is also poor in the district.
- When valued at average district level prices, the value added in agriculture per hectare was more or less similar in all blocks. They did not seem to be correlated with the proportion of flood prone area in the block. Farmers seem to have adapted their cropping pattern and practices to flooding.
- Some of the interventions of the SDTT seem effective but their widespread adoption has not yet taken place.
- Lack of access of proper water and sanitation facilities, access to energy, health facilities also play a major role in the overall livelihood scenario of these districts.

The project is supported by the Sir Dorabji Tata Trust (SDTT).

5 EVENTS – WORKSHOPS, MEETINGS AND LECTURES

5.1 Roundtable Discussion on "India's Energy Transition till 2050 in the Global Context"

IRADe organized a roundtable discussion on "India's Transition till 2050 in the Global Context", wherein the report "Indian Perspectives on Global Energy Scenarios Till 2050" was released on 8th February 2014 at India Habitat Center, New Delhi.

This report is an outcome of the analysis done in collaboration with International Institute for Applied Systems Analysis (IIASA) and sponsored by Technology, Information, Forecasting and Assessment Council (TIFAC), Department of Science and Technology, Government of India. The event was held to discuss key findings and debate some of the critical messages concerning road-map for transition in the energy mix in India.

Dr. K. Kasturirangan, Member, Planning Commission, was the Chief Guest, and released the report, which was followed by a Round Table Discussion chaired by Dr. Pavel Kabat; CEO & Director General, IIASA, Austria.

5.2 Interactive Session on "Accelerating India's Growth: What is Needed?"

As a part of the 10th anniversary celebration of IRADe, an interactive session was organized on "Accelerating India's Growth: What is needed?" on 14th January 2014 at India International Center, New Delhi. The session was chaired by the Nobel Laureate, Prof. Joseph Stiglitz, Columbia University.

5.3 Second Meeting of the Project Steering Committee of SARI/EI

The 2nd meeting of Project Steering Committee (PSC) of SARI/EI was organized on 8th January, 2014 at New Delhi, India. Members of the Project Steering Committee from various South Asian countries along with representatives from IRADe, USAID and USEA attended the meeting.

2nd Project Steering Committee Meeting, SARI/EI (8th January, 2014 | New Delhi, India)

5.4 South Asia Regional Inaugural Conference of SARI/EI

The South Asia Regional Inaugural Conference of SARI/EI on 'Cross-Border Electricity Trade' was held from October 4th – 5th 2013 at New Delhi, India. The conference was inaugurated by Dr. Montek Singh Ahluwalia, Deputy Chairman, Planning Commission, Government of India (GoI). Conference witnessed active participation from the high level representatives/delegations from the governments of all the eight participating nations of the region namely Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka. Speakers and delegates were from both the public and private sector, multilateral development banks like the Asian Development Bank (ADB), World Bank and regional SAARC Energy Centre etc.

5.5 Task Force 1 on "Coordination of Policy, Legal and Regulatory Framework"

The 1st Meeting of Task Force - 1 on "Coordination of Policy, Legal and Regulatory Framework" of SARI/EI Program was held from 24th - 25th July, 2013 at Dhaka, Bangladesh. 'The members deliberated on the policy, legal and regulatory issues with respect to Cross-Border Electricity Trade. The Task Force Working methodology and Terms of Reference were discussed and accepted.

2nd Meeting of Task Force 1 on "Coordination of Policy, Legal and Regulatory Framework", SARI/EI (19th-20th February, 2014 | Colombo, Sri Lanka)

The 2nd Meeting of Task Force 1 on "Coordination of Policy, Legal and Regulatory framework" of SARI/EI was organized on 19th-20th February, 2014 at Colombo, Sri Lanka.

Task Force Members from various South Asian countries along with representatives from IRADe and USAID attended the meeting. IRADe presented the progress of the SARI/EI program, review of activities for the year 2012-2013, outcomes of South Asia regional Inaugural conference on "Cross-Border Electricity Trade", progress and plan for the year 2013-2014, overall strategy, activities and the key deliverables for Task Force 1.

5.6 Task Force 2 on "Advancement of Transmission Systems Interconnections"

The 1st Meeting of Task Force - 2 on "Advancement of Transmission Systems Interconnection" of SARI/EI Program was organized from 21st - 22nd August, 2013 at Thimphu, Bhutan. The members discussed and deliberated in detail the various technical and operational aspects of power transmission and power systems integration in South Asia.

1st Meeting of Task Force - 2 on "Advancement of Transmission Systems Interconnection" of SARI/EI Program (21st - 22nd August, 2013 | Thimphu, Bhutan)

5.7 Task Force 3 on "South Asia Regional Electricity Markets"

The overarching objective of the South Asia Regional Initiative for Energy Integration (SARI/EI) program is to develop a common template for technical and commercial aspects of power exchange among the South Asian countries. It intends to create the right enabling environment to support the establishment of a South Asian electricity market, gain consensus and support from the key decision makers and stakeholders in the South Asia region.

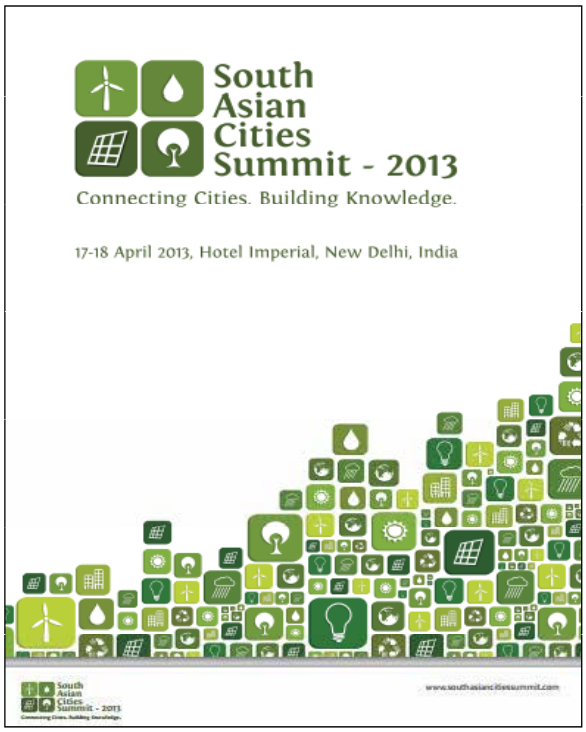
South Asia Regional Inaugural Conference of SARI/EI on 'Cross-Border Electricity Trade' (October 4th-5th, 2013 | New Delhi, India)

The conference was inaugurated by Dr. Montek Singh Ahluwalia, Deputy Chairman, Planning Commission, Government of India (GOI). Conference witnessed active participation from the high level representatives/

delegations from the governments of all the eight participating nations of the region namely Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka. The 2nd day of the two-day conference witnessed live telecast of the inauguration of 500MW India-Bangladesh link by the Prime Minister of India, Dr. Manmohan Singh and Ms. Sheikh Hasina Wajed, Prime Minister of Bangladesh which is a major milestone towards the establishment of CBET in the region.

5.8 South Asian Cities Summit 2013

The summit was organised by the Cities Network Campaign during 17-18th April 2013, in association with, the Department of Environment (Delhi Government), the All India Institute of Local Self Government (AIILSG), the World Resources Institute (WRI) – India, The Green Mantra and UNESCO. More than 200 delegates attended the South Asian Cities Summit 2013; IRADe coordinated the session on "Governing climate change in cities through policy interventions". The main agenda of this session was to discuss issues governing climate change in cities through policy interventions, and find out the adaptive and mitigation strategies to reduce the impacts of climate change in South Asian cities.



Speakers for the session include:

1. Mr S.K Nanda, Home Secretary, Government of Gujarat
2. Dr. Jyoti Parikh, Executive Director, IRADe, New Delhi
3. Mr.Srinivasan Iyer, Assistant Country Director, UNDP
4. Mr Russel Rollason, First Secretary of AusAID, Australian High Commission
5. Ms Himani Jain, Team Leader, Shakti Sustainable Energy Foundation
6. Ms Aude Flogny, Regional Director For South Asia, French Development Agency (AFD)

6 PROFESSIONAL ACTIVITIES

6.1 Dr. Jyoti K Parikh, Executive Director, IRADe

Selected list of events attended by Dr. Jyoti K. Parikh (2013-14)

- Attended as a Speaker at Talk about Climate/Environment in relation to poverty and especially genders at Conference/Hearing in European Parliament on 10th April, 2013, Brussels
- Attended an Inaugural Session of South Asian Cities Summit on 17th April, 2013, New Delhi.
- Attended Governing Council Meeting of National Institute of Urban Affairs (NIUA) on 26th April, 2013, New Delhi
- Attended Round Table Discussion "Thinking Financing & Building Climate Resilient Cities", Organised by French Development Agency(AFD) on 3rd May, 2013, New Delhi
- Attended Think Tank Forum Meeting of GIZ on 28th June, 2013, New Delhi
- Attended WG III, Fourth Lead Author Meeting of IPCC on 1st July, 2013, Addis Ababa, Ethiopia
- Attended Round Table meeting on "Energy Security of India". Organised by NIRMA University on 6th August, 2013, Ahmedabad
- Attended Round Table of Experts on "Achieving 12th Plan Target for Green Energy – The Road Ahead" on 23rd August, 2013, New Delhi organized by India Energy Forum (IEF).
- Attended Conference on Innovations in Urban Governance. Organised by Ministry of Urban Development on 26th August, 2013, New Delhi
- Attended 1st Annual Energy Conclave 2013, organised by MINT on 30th August, 2013, New Delhi
- Attended Conference on Climate Asia findings for India, organised by BBC Media Action, India on 19th September, 2013, New Delhi
- Attended National Conference on "Accelerating Technology Innovation for Inclusive and Sustainable Growth", organised by DSIR on 7th November, 2013, New Delhi
- Panelist in Session 5 on "Regional Cooperation for Energy Security", organised by ESCAP on 29th November, 2013, New Delhi
- Guest of Honour at the Inaugural Function of 6th International Seminar on "Energy for Sustainable Development in Asia Pacific". Organised by Guru Arjun Dev Institute of Development Studies on 30th November, 2013, Amritsar

- Attended Press Brief Event on Responses of cities to Climate Change, organised by ACCCRN & TARU on 9th December, 2013, New Delhi

- Panelist in Session "Mainstreaming Climate Resilience into Urban Development" at National Conference on Emerging Mechanism & Responses of Cities to Climate Change, organised by ACCCRN & TARU on 10th December, 2013, New Delhi

- Speaker at Special Session on "Green Energy". Organised by India Japan Global Partnership Summit on 18th December, 2013, NOIDA

- Attended Interactive Session on "Accelerating India's Growth" Chaired by Prof. Joseph Stiglitz on 14th January, 2014, New Delhi

- Attended CEOs/Directors/Top Management Conclave on "Some Issues Energy & Climate Change: Oil & Gas. Organised by PetroFed on 21st February, 2014, New Delhi

- Attended Workshop on "Climate Change Adaptation", organised by ICIMOD on 25th February, 2014, Guwahati, Assam

- Attended Exploring Options to take forward UK-India Collaboration on sustaining Water Resources for Food, Energy & Ecosystem Services on 27th March, 2014, New Delhi

Mr. Rohit Magotra

- Participated as Discussant in the session titled "Smart and Inclusive Cities in 6th Euro India Summit on Greening Cities" held at Hyderabad, India on 21st -22nd October, 2013.

Mr. Sharad Verma

- Participated in the meeting of India Energy Scenario 2030, Report release and discussion on 26th February 2014 at New Delhi organized by Brookings India-McKinsey.

- Participated in the conference on Accelerating Technology innovation for inclusive and sustainable growth on 7th November, 2013 at Vigyan Bhawan organized by DSIR-NMCC.

- Participated in the conference on India Clean Cookstove Forum on 25th – 26th November 2013 at Le Meredian, New Delhi, organized by MNRE, GIZ, INSPIRE.

Dr. Probal Ghosh

- Participated in SAARC Seminar on Role of Private Sector in Regional Power Trade on 26th – 27th September, 2013 in India

- Participated in SARI EI conference on "Cross border Electricity Trade" 4th – 5th October 2013 in New Delhi

- Participated in WWF report launch conference: 'Roadmaps for a sustainable India', 5 February, IIC, New Delhi

- Participated in CEE report launch workshop: Roundtable Discussion on Energy Transition in India? Exploring the German Energiewende, on 7th March 2014 at India Habitat Centre.

Dr. Ashutosh Sharma & Mr. Chandrashekhar

- Participated in the symposium on "Leapfrogging Methodology & Technology in Household Survey Research: Lessons from the US and India" organized by NCAER in partnership with the Survey Research Center & the Population Studies Center, University of Michigan on Wednesday, November 13, 2013 at NCAER Conference Room

Mr. Mohit Gupta

- Participated in the workshop on "Changing Demography, Migration and Urbanization" organized by GIZ & Observer Research Foundation on 25th September, 2013 at Observer Research Foundation, 20, Rouse Avenue Institutional Area, New Delhi

7 LIST OF PROJECTS (2013-14)

S.No.	Title	Funding Agency	Status
1	Study on "Economy-Wide Model for Low Carbon Strategy	Planning Commission	Ongoing
2	Assessing Socio-Economic Vulnerability to Climate Change: A Case Study of Assam	ICSSR	Completed
3	CDMP Review of Six Cities	UNDP	Completed
4	South Asian Regional Initiative for Energy Integration (SARI/EI)	USAID	Ongoing
5	Analysis of Factors Affecting Agricultural Productivity in the Flood Plains of Eastern Uttar Pradesh to Synergize SDTT Investments in the Region	Sir Dorabji Tata Trust (SDTT)	Ongoing
6	Sustainable and Disaster Resilient Urban Development	Ministry of Urban Development	Ongoing
7	Environmentally Sustainable and Integrated Energy Strategy for Gujarat State	Gujarat Power Corporation Ltd. (GPCL)	Ongoing
8	Vulnerability of Coastal Cities on Rivers to Climate Change: Case Study of Surat to Develop Adaptation Framework	Ministry of Earth Science (MoES)	Ongoing
9	Socio Economic Vulnerability of Himachal Pradesh to Climate Change	Ministry of Science and Technology	Ongoing
10	Vulnerability Profiling of Cities – A Framework for Climate Resilient Urban Development in India	IIED	Ongoing
11	Critical Evaluation of the 12th Five-Year Plan from a Climatic Perspective	ICRIER	Ongoing
12	A policy Brief on Emerging Mechanisms and responses of Cities to Climate-ACCCRN	TARU Leading Edge Pvt. Ltd.	Completed

IRADe Annual Report 2013-2014

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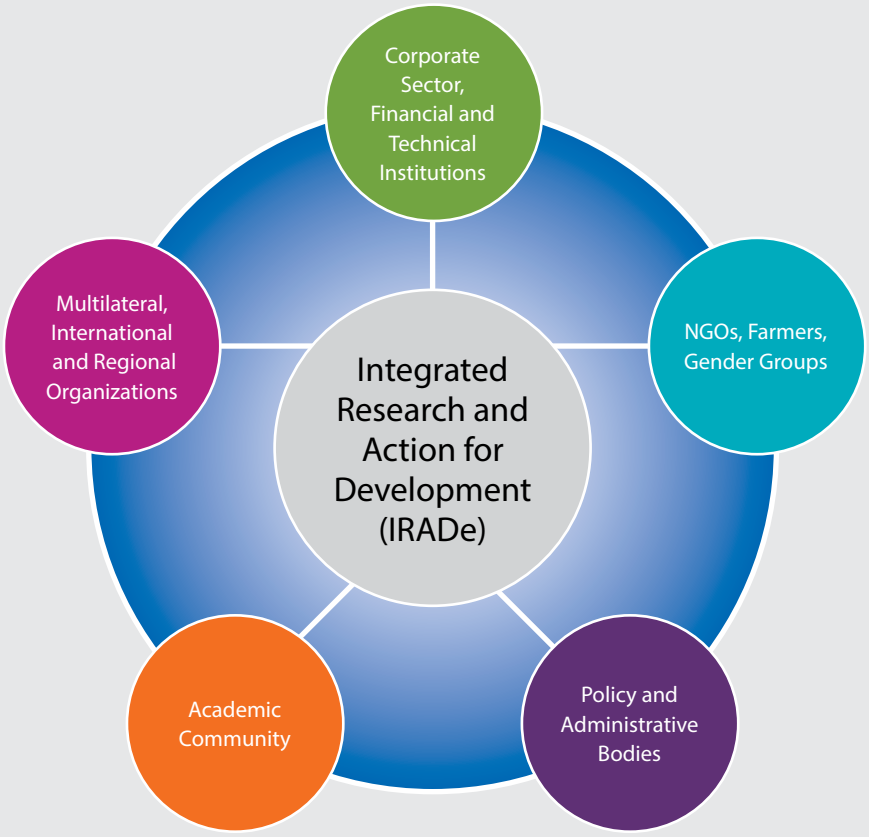
IRADe Integrated Research and Action for Development

IRADe networks with the government, ministries/ departments, international organizations, public and private sectors, academic experts, NGOs, and consultants to work on projects awarded by them. The ministries include Ministry of Environment and Forests, Ministry of New and Renewable Energy, the Planning Commission, Ministry of Power, Ministry of External Affairs, Ministry of Earth Sciences, Department of Science and Technology, Central Statistical Organization under Ministry of Statistics and Programme Implementation, Technology Information, Forecasting and Assessment Council (TIFAC), etc. for many national level projects.

At the international level, IRADe has worked with Stanford university, California and United States Environmental Protection Agency (USEPA), Wuppertal Institute for Climate, Environment and Energy, WISION-Germany, Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ), Germany; ENERGIA-International Network for Gender and Sustainable Energy, Netherlands; British High Commission; International Institute for Applied Systems Analysis (IIASA), Austria, U.S. Agency for International Development (USAID) etc. IRADe has collaborated with private sector and multinational organizations and NGOs such as Sir Dorabji Tata Trust (SDTT), SEWA, Petroleum Federation of India, Pricewater House Coopers, ICF International, Rockefeller Foundation, Institute for Social and Environmental Transition (ISET), Center for Clean Air Policy (CCAP) and Shakti Foundation, among others.

IRADe carried out monitoring and evaluation work for Rajiv Gandhi Grameen Vidyut Yojana (RGGVY) for rural electrification. It has done pioneering work in the area of Natural Resource Accounting (NRA) in general, and for Goa and Andhra Pradesh specifically; climate adaptation for Ministry of Earth Sciences; and low carbon strategy for inclusive growth for the British High Commission.

Our Partners in Development



Planning Commission
Government of India

Ministry of New and Renewable Energy
Government of India

MINISTRY OF FINANCE
GOVERNMENT OF INDIA

iisd International Institute for Sustainable Development / Institut international du développement durable

USAID
FROM THE AMERICAN PEOPLE

DFID Department for International Development

Rockefeller Foundation
Innovation for the Next 100 Years

ACCCRN Asian Cities Climate Change Resilience Network

giz

SHAKTI
SUSTAINABLE ENERGY FOUNDATION

iied

Indian Council of Social Science Research

WWF

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