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FOUNDATION



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APRIL 23

OTTAWA, ON

APRIL 24-25

SHANGRI-LA HOTEL,
TORONTO, ON

Canada India

Infrastructure Forum

in partnership with Canada India Centre, Carleton University

2014

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Canada India Infrastructure Forum, 2014 Ottawa and Toronto, April 23-25, 2014

Canada India Foundation (CIF), one of Canada's most prominent Indo-Canadian organizations, was formed as a non-profit public policy organization for the express purpose of promoting stronger relations between Canada and India. During the past 5 years, CIF has been working towards this objective. CIF has been actively engaged with Cabinet Ministers, Members of Parliament, Senators, including the Canada India Interparliamentary Friendship Group, as well as Indian business and political leaders. Our Charter members have, either individually or collectively, made substantial contributions to the creation and operation of Canada India centres on public policy in Canadian universities, such as Waterloo and Carleton.

The current Executive Team of CIF is Chaired by Dr. V.I. "Lucky" Lakshmanan, an internationally renowned scientist, as well as an educator, entrepreneur and philanthropist. He is joined in the Executive Committee by Mr. Laj Prasher as National Convenor, who heads a successful Tier 2 telecommunications company, and like Dr. Lakshmanan, also passionate in his belief in the need for stronger Canada India ties. This passion is shared by other members of the national executive, such as Co-Chair, Mr. Jay Minhas, Co-Chair, Dr. Atul Tolia, Ms. Anita Dalakoti, Mr. Vasu Chanchlani, Mr. Deepak Ruparell, Mr. Pankaj Dave, Mr. Ramesh Chotai, Mr. Sachin Mahajan, and Mr. Barj Dhahan. As an intentionally small membership organization, CIF depends on its members for the influential network that it has successfully developed, substantially raising the profile of the Indo-Canadian community.

CIF's most significant initiative has been the organization of thematic Canada India Public Policy Forums, focusing on selected opportunity sectors. CIF has organized three such forums, on Energy (2009), Mining and Metals (2010), Agriculture and Food Processing (2012).

CIF's Canada-India Forums: CIF Executives recognized that one of the best avenues for highlighting and promoting opportunities for greater trade between Canada and India was through public policy focused thematic forums. CIF believes that, with a comprehensive approach to addressing the top 5 areas of partnership reflecting both Canada's strength and India's need, i.e. Energy, Agriculture, Education, Mining and Infrastructure (including water), the current target of \$15 billion in bilateral trade should be easily achievable. CIF invited senior leaders of government and government agencies, CEO's and other leaders of private sector, independent industry experts, academicians to take part in panel sessions on a full range of sub-topics, with each panel, balanced and consisting of 5-6 stakeholders engaging in a discussion on the sub-topic, and culminating in a Go-Forward session, where the main discussion points were consolidated in to prioritized recommendations for action.

The Canada India Energy Forum 2009, conceived and organized by CIF in Toronto, was the first forum of its kind and scope, that discussed opportunities, challenges and policy imperatives in the areas of Renewable Energy (including Solar and Wind), Fossil Fuels, Nuclear and Investment in high-level panels, concluding with a policy recommendation panel session. Plenary speakers at the Forum included Canada's Energy Minister, Lisa Raitt and India's Deputy Chairman of the Planning Commission, Montek Singh Ahluwalia. Other speakers included Gerald Grandey, CEO of Cameco, Duncan Hawthorne, CEO of Bruce Power and Tulsi Tanti, Chairman, Suzlon Energy, India. Primary sponsor for the Forum was the Government of Ontario. Other sponsors included Ontario Power Generation (OPG), DFAIT, EDC, NRC, State Bank of India, Canaccord Genuity, Borden Ladner Gervais, Process Research ORTECH and Bio Auto Council. The top policy recommendation made at the Forum was the initiation of the civil nuclear agreement between Canada and India. CIF had earlier, in 2008, been part of a meeting between the Prime Minister of Canada, the Right Honourable Stephen Harper and former President of India, Dr. Abdul Kalam, when the suggestion of a civil nuclear partnership between the two countries was first made. It was heartening to see this suggestion become a reality subsequently.

Feedback from the Energy Forum encouraged CIF to organize the next thematic forum, Canada India Mining and Metals Forum 2010, also on Toronto. The successful formula from the Energy Forum was maintained. Key speakers included Dr. Abdul Kalam, former President of India, David Anderson, MP and Vijay Kumar, Secretary, Ministry of Mines, Government of India. Sponsors included Teck, TSX, Ontario Chamber of Commerce, Deloitte, BLG, Canaccord Genuity and others. Panel topics covered included Iron & Steel, Non-Ferrous and Light Metals, Coal, Uranium, Gold & Diamond, Metal Trading & Recycling, Capital Markets, Sustainable Development and Public Policy.

The third and most ambitious Forum to-date, Canada India Agriculture and Food Processing Forum 2012, was held sequentially in Vancouver and Saskatoon over 4 days. Generous support was provided by the Province of British Columbia as well as Government of Saskatchewan, Agriculture and AgriFood Canada and University of Saskatchewan. Other sponsors included RBC Royal Bank, Farm Credit Canada, Nature's Path Foods, University of British Columbia and others. Key speakers included Minister of Western Economic Diversification, Lynne Yelich, several Ministers from the BC Government, led by Premier Christie Clark, Minister Manmeet Bhullar from Province of Alberta, Senator Asha Seth, Yuen Pau Woo, CEO, Asia Pacific Foundation Canada and Saumitra Chaudhury, Member of Planning Commission, India. The wide range of topics covered by panelists included Food Security, Export of Agri/Seafood to India, Family Farms & Cooperatives, Food Processing, Grain Storage & Supply Chain, Cash Crops, Land Resource Management, Plants & Animals, Technology Enablers and Market Access. The Forum not only met the objectives of making policy recommendations in the Agriculture sector, but also opened the eyes of the attendees, and CIF as well, through site visits, as to the tremendous research work being done in Canada, which would directly support food security for the Indian citizen.

Canada India Infrastructure Forum 2014: The theme that Canada India Foundation has chosen for its next Canada India forum is Infrastructure. Investment in India's infrastructure is projected by FICCI (Federation of Indian Chambers of Commerce and Industry) to double from its current value to \$1 trillion in the twelfth five-year plan ending 2017. Much of this amount will have to be marked for roads, railways and ports, areas neglected in the previous plan. A few facts about India are pertinent, when considering the need and prospects for infrastructure investment. The average Indian in 2015 will be less than 29 years old, relatively more affluent and much more mobile than previous generations of Indians. Collectively, the 400+ million strong Indian middle class represents a purchasing power that requires an efficient infrastructure to take advantage of it. In terms of demographic distribution, India's urban population is expected to increase to 700 million by 2020. The urban sprawl will be led by six megacities with a population of 10 million or more – more than in the whole of Europe.

The infrastructure conjures up images of bricks and mortar, of roadways, bridges and buildings. Infrastructure, however, goes beyond just bricks and mortar. Efficient infrastructure connectivity is the backbone of national GDP growth. Connectivity through air, surface and water is essential for India's growing population, particularly with its youth-heavy demography and middle class. Water is the essential ingredient for quality living. India experiences both the exuberant abundance of water, evidenced by the monsoon floods, and the acute scarcity of water, evidenced by droughts. An infrastructure project linking the regional waterways of India will address the problems of both floods and droughts. It is a project, near and dear to the former President of India, Dr. Abdul Kalam, a champion of Canada-India relations and a frequent guest of Canada India Foundation. The relationship between water safety and civil infrastructure improvement is also recognized by the India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Community Transformation and Sustainability (IC-IMPACTS), the \$30 million government funded partnership between University of British Columbia, University of Alberta and University of Toronto and a participant in the Infrastructure Forum.

CIF's Canada India Infrastructure Forum is scheduled to take place in Ottawa at Carleton University's Canada India Centre on April 23, 2014, followed by 2 days in Toronto on April 24 and 25, 2014 at Shangri La Hotel. The Forum will be structured along panels with topics to include transport infrastructure, public transit, hospitality, energy infrastructure, water resources, distribution, social infrastructure, sustainable infrastructure and others. As with previous forums, we will be seeking participation of top levels of government (both federal/central and provincial/state), industry leaders, academics and independent industry analysts. Keynote addresses by high level representatives from both countries would set the stage for the dialogues to follow and for the go-forward policy recommendations that would form the essence of the Forum. Most importantly, the Forum will again provide the opportunity for networking of people involved in the infrastructure lane of the Canada India corridor.

The high level of interest both federal and provincial governments have shown is indicated by the number of ministers who will be speaking at the Forum. Federal Minister of multiculturalism, Hon. Tim Uppal will open the Forum in Ottawa, along with India's High Commissioner in Canada, Admiral (Retd.) Nirmal Verma. Ontario's Minister for Community Safety, Hon. Yasir Naqvi, will also speak in Ottawa. The Toronto session will feature at least 3 provincial ministers, Ontario's Hon. Glen Murray, Minister of Infrastructure and Hon. Eric Hoskins, Minister of Economic Development and Trade, as well as Hon. Teresa Wat, British Columbia's Minister of International Trade. They will be joined by Canadian private sector luminaries, such as Pierre Pyun, from Bombardier, a major Canadian player in India's Infrastructure scene, John Beck, Chairman of Aecon, one of Ontario's 's leading infrastructure companies, Bruce McCuaig, CEO of Metrolinx, Ontario's transit solution provider and others. They are joined by a powerful delegation from India's private sector. Delegates will also hear about the Narmada canal solar project, the first of its kind in the world, and an equally innovative and ambitious program to link waterways of India.

As India begins to revamp and enhance its infrastructure to reflect the needs and aspirations of its billion plus people, it will need the support and partnership of nations like Canada. From Canadian perspective, it is important that not only is Canada willing to be that supporting partner, but that it engages both the Indian (central and state) government as well as the Indian people to demonstrate its proven abilities as an infrastructure solutions provider, and as a nation that truly cares for the well-being of India. The role played by influential indo-Canadian organizations in civil society, exemplified by Canada India Foundation, in bringing together government leaders, business leaders, as well as academic and social leaders to identify opportunities and overcome challenges, will be crucial.



Dr. V.I. "Lucky" Lakshmanan



Marc Kealey

Co-Chairs
Canada India Infrastructure Forum - 2014



PRIME MINISTER · PREMIER MINISTRE

I am pleased to extend my warmest greetings to everyone attending the Canada India Infrastructure Forum 2014.

Canada and India have longstanding bilateral relations, built upon shared traditions of democracy, pluralism, and strong interpersonal connections based on an Indian Diaspora of more than one million. Our hardworking Indo-Canadian community has played an important part in realizing Canada's success and prosperity and in promoting commercial and cultural ties between Canada and India.

India's dynamic and fast-growing economy is a priority market for Canadian firms, and with negotiations on a free trade agreement ongoing, our two-way trade is expected to continue to expand in the coming years. I am sure that this forum will provide an ideal setting for networking with fellow entrepreneurs and exploring exciting new investment opportunities.

On behalf of the Government of Canada, I offer my best wishes for a productive gathering.

The Rt. Hon. Stephen Harper, P.C., M.P.

OTTAWA
2014



भारत का उच्चायुक्त, ओटवा
HIGH COMMISSIONER FOR INDIA
OTTAWA

April 08, 2014

MESSAGE

I have great pleasure in sending my greetings and best wishes to the organizers and members of the Canada India Foundation (CIF) on the occasion of the Canada India Infrastructure Forum in Ottawa (April 23) and Toronto (April 24-25).

The CIF since its inception in 2007 has done commendably well in fostering support for stronger relations between Canada and India through regular dialogues and India-focused initiatives.

The current initiative of the 4th theme forum, the 'Canada India Infrastructure Forum 2014' in partnership with Carleton University is indeed exemplary. With our rapidly growing economy, development in the infrastructure sector is the need of the hour and a Forum on this is apt and timely.

I take this opportunity to convey my best wishes to the CIF for the successful culmination of the event and also in all their future endeavours.

Admiral (Retd) Nirmal Verma
High Commissioner

10 Springfield Road, Ottawa, Ontario, K1M 1C9
Tel: +1-613-744-2406 & 744-0909 Fax: +1-613-744-0913
Email: hc@hciottawa.ca Website: <http://www.hciottawa.ca>



Premier of Ontario - Première ministre de l'Ontario

April 23 – 25, 2014

A PERSONAL MESSAGE FROM THE PREMIER

On behalf of the Government of Ontario, I am delighted to welcome everyone to the Canada India Infrastructure Forum 2014.

This forum is a great opportunity to identify trade and partnership opportunities in the infrastructure sector between our two countries. As Premier, I understand that infrastructure is the foundation of strong communities and of a strong Ontario. By building schools, hospitals, roads, subways and telecommunications lines, we are creating jobs for today, attracting investment and keeping us competitive for the future.

I want to thank the Canada India Foundation for organizing this infrastructure forum in co-operation with Carleton University Ottawa. Events like this are important because they lay the foundation for future strategic partnerships and increased bilateral trade.

Please accept my best wishes for an informative and enjoyable forum.

Kathleen Wynne
Premier

**Ministry of Economic
Development, Trade
and Employment**

Office of the Minister

8th Floor, Hearst Block
900 Bay Street
Toronto ON M7A 2E1
Telephone: (416) 325-6900
Facsimile: (416) 325-6918

**Ministère du Développement
économique, du Commerce
et de l'Emploi**

Bureau du ministre

Édifice Hearst, 8e étage
900, rue Bay
Toronto ON M7A 2E1
Téléphone: (416) 325-6900
Télécopieur: (416) 325-6918



April 24 – 25, 2014

A Message from the Honourable Dr. Eric Hoskins Minister of Economic Development, Trade and Employment

Welcome to the Canada-India Infrastructure Forum, 2014. Congratulations to the Canada India Foundation for making this important event possible.

International trade and collaboration with countries like India is what helps make Canada strong. This forum brings together business leaders from both nations who share a commitment to growing their respective economies by building new and innovative partnerships and strengthening current relations.

Our government understands the importance of a strong bilateral relationship between Ontario and India. In fact, India is a priority market for Ontario's international economic and innovation agenda. That is why we have adopted a multi-pronged approach to the Indian market with the objective of attracting investment, promoting exports and nurturing science and technology collaborations. Growing our presence in these markets offers the greatest potential for strengthening Ontario's export-based economy.

Ontario and India have a long-standing relationship that covers many areas, including investment, trade, research collaboration and educational exchange. There have been six major Premier- or minister-led business missions to India since 2006 and my ministry will spearhead another three sector-specific missions to India this fiscal year. India is a key focus of our Going Global Trade Strategy, and we look forward to building new investment opportunities for both our jurisdictions, now and in the future.

I encourage you to take advantage of the wealth of expertise in the room today as you work toward strengthening our cultural and economic ties. Please accept my best wishes for a successful event.

Sincerely,

A handwritten signature in black ink that reads "Eric Hoskins".

Dr. Eric Hoskins
Minister



A Message from the Premier

On behalf of the Province of British Columbia, I am pleased to congratulate the Canada India Foundation for organizing and hosting the 4th Canada India Forum.

The Government of British Columbia is committed to growing the economy, and that means expanding trade with priority markets like India, and diversifying our markets. Our proximity to Asia is one of our many competitive advantages and makes us Canada's gateway to the Pacific.

British Columbia has expanded its trade and investment network in India to connect BC organizations and companies with new opportunities. We have the expertise to help meet the future needs of India's growing population and emerging middle class. BC also offers significant investment opportunities for Indian companies through our developing liquefied natural gas (LNG) industry and transportation infrastructure.

By attending this forum you will have the opportunity to meet with government representatives, industry leaders, academics and investors from both Canada and India. You will explore ideas that may be instrumental in developing new opportunities for greater trade between our two countries.

Enjoy your time at this inspiring event. I look forward to hearing more about how Canada can play a role in developing opportunities for both jurisdictions and help India address its future infrastructure needs.

Sincerely,

Christy Clark
Premier

Hill Office
Room 260 West Block
House of Commons
Ottawa ON K1A 0A6
Tel: (613) 992-3394
Fax: (613) 996-7923
Email: brownpa@parl.gc.ca



Riding Office
302-299 Lakeshore Drive
Barrie, ON, L4N 7Y9
Tel: (705) 726-5959
Fax: (705) 726-3340
Email: barrie@servingbarrie.com

Patrick Brown
Member of Parliament
Barrie

Greetings,

As the Member of Parliament for Barrie and Co-Chair of the Canada-India Parliamentary Friendship Group, I would like to extend my best wishes to the Canada India Foundation for a successful Infrastructure Forum 2014.

This forum is an important occasion that honours the flourishing business opportunities between Canada and India and also highlights the rich cultural heritage of the Indo-Canadian community.

Recent years have proved a very active time for the Canada-India Partnership. The CIF has played an instrumental in advancing this growing relationship through annual forums to help develop and grow the ambitious Canada-India economic partnership. I express my sincere appreciation to the CIF for their dedication to strengthening the bilateral ties between Canada and India.

I would like to congratulate all participants and attendees of this year's forum. Please accept my best wishes for a successful event.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Patrick Brown', is placed over a light pink rectangular background.

Patrick Brown
Member of Parliament for Barrie
Co-Chair of the Canada-India Parliamentary Friendship Group



April 23, 2014, Ottawa
Canada India Centre of Excellence, Carleton University

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|-----------------------|--|---|
| 8:00-9:00 am | Registration, Breakfast, Networking | |
| 9:00-10:00 am | Welcome | Dr. V.I. Lakshmanan Chair, Canada India Foundation Vice-Chairman and CEO, Process Research ORTECH, Canada Dr. Roseann Runte President, Carleton University |
| | Opening Address | His Excellency Nirmal Verma High Commissioner of India in Canada Hon. Tim Uppal Minister of State (Multiculturalism), Government of Canada |
| 10:00-10:30 am | Health Break | |
| 10:30-12:00 am | Plenary Session | Mr. Pierre Pyun, VP. Govt Affairs, Bombardier Dr. V. Raghunathan, Chairman, GMR Foundation Mr. Todd Winterhalt, Group VP, International Business, EDC Mr. Randy Zadra, Director, Carleton University Dr. Amit Kapoor, Institute of Competitiveness, India |
| 12:00-1:00 pm | Lunch | |
| | Keynote Address | Hon. Yasir Naqvi Minister of Community Safety & Correc. Services, Govt. of Ontario |
| 1:00-2:30 pm | Panel Introduction | Ms. Jaswinder Kaur, Director, Canada India Centre, Carleton Univ. |
| | Panel Session | ICT |
| | Moderator: | Mr. John Reid, President and CEO, CATA Alliance |
| | Speakers: | Mr. Raj Narula, Preident and Co-Founder, TaraSpan Dr. Anand Srinivasan, Vice-President, EION Wireless Mr. Jim Ghadbane, CEO, Canarie Dr. Veena Rawat, Advisor, GSM Association |
| 2:30-4:00 pm | Panel Session | CLEAN TECHNOLOGY |
| | Moderator: | Mr. Niraj Bhargava, CEO, New Energy Group |
| | Speakers: | Mr. Kevin Loiselle, President, CEO, Mr. Zoltan Tompa, Director Partnerships, SDTC Mr. Geoff Murphy, Director, Natural Resources Canada Mr. Raju Rajagopalan, Head, Quality, SunEdison India Dr. Ram Sahi, Adj. Prof. Department of Economics, Carleton U. |
| 4:00-5:00 pm | Vote of Thanks | Dr. Pradeep Merchant, Co-Chair, Board of Directors Canada India Centre, Carleton University |
| | Networking | |

April 24, 2014, Toronto

Shangri-La Hotel, Toronto

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|----------------|--|--|
| 7:30-8:30 am | Registration, Breakfast, Networking | |
| 8:30-9:30 am | Welcome | Mr. Marc Kealey Co-Chair, Canada India Infrastructure Forum |
| | Opening Address | Hon. Glen Murray, M.P.P. Minister of Infrastructure, Government of Ontario Mr. Akhilesh Mishra Consul General, Consulate of India, Toronto |
| 9:30-10:30 pm | Panel Session | CONSTRUCTION (1) |
| | Keynote Speaker: | Mr. John M. Beck, Chairman/CEO, Aecon |
| | Speakers | Mr. David Tsubouchi, CEO, Ontario College of Trades Mr. Patrick Dillon, Business Mgr. Building Constr.Trade Ont |
| 10:30-11:00 am | Health Break | |
| 11:00-12:15 am | Panel Session | TRANSPORTATION |
| | Keynote Speaker: | Mr. Bruce McCuaig, President and CEO, Metrolinx |
| | | Dr. V. Raghunathan, Chair, GMR Foundation Prof. A.C. Kamaraj, Chair, National Waterways Dev Council Prof. Nemkumar Banthia, CEO, IC-IMPACTS |
| 12:30 pm | | Lunch |
| 1:00-1:30 pm | Keynote Address | Hon. Eric Hoskins, MPP Minister of Economic Development and Trade, Govt. of Ontario |
| 2:00-3:30 pm | Panel Session | WATER MANAGEMENT |
| | Speakers: | Dr. Raman Venkatesh, Sr. VP, R&D, Eureka Forbes, India Dr. Stephen Katz, GE Water Mr. Vinod Munshi, Country Manager, Kirloskar Group Dr. Senthil Nathan, Senior Advisor, Process Research ORTECH Mr. V. Ponraj, Advisor, Dr. Kalam, former President of India Dr. Lee Wilson, Advisory Board Member, Nanostruck |
| 3:30-3:45 pm | Health Break | |
| 3:45-5:00 pm | Panel Session | FINANCING/PPP |
| | Moderator: | Mr. Prashant Pathak, Reichmann Capital Partners |
| | Speakers: | Mr. Joseph Mancinelli, Vice-President, LIUNA/Fengate Capital Mr. Alan O'Dette, Chair, Ontario Chamber of Commerce Mr. Sachin Mahajan, MD M&A, Canaccord Genuity Mr. Rudra Dalmia, Saxo India Mr. Bundeep Rangar, Chair, Nanostruck Mr. Sunil Tandon, MD, Ariston Group of Companies |
| 6:00-7:00 pm | Evening Reception | |
| 7:00-7:30 pm | Dinner | |
| 7:30 pm | Keynote Address | Hon. Teresa Wat Minister of International Trade, Government of British Columbia |



April 25, 2014, Toronto

Shangri-La Hotel, Toronto

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|---------------------------------|--|---|
| 7:45-8:30 am 8:30 am | Networking, Breakfast Opening Remarks | Mr. Patrick Brown, Member of Parliament Co-Chair, Canada India Interparliamentary Friendship Group |
| 8:30-9:45 am | Panel Session Moderator: Speakers: | POWER Mr. Naval Bajaj, President, Indo-Canada Chamber of Commerce Mr. Lewis Staats, Grand River Green Power Mr. John Brace, CEO, Northland Power Mr. Raju Rajagopalan, Head, Quality, SunEdison Mr. Howard Shearer, Chairman and CEO, Hitachi Canada Mr. Alex Bettencourt, President, SmartGrid Canada |
| 9:45-10:00 am 10:00-11:00 am | Health Break Panel Session Keynote Speaker: | CONSTRUCTION (2) Mr. G.R.K. Reddy, Chairman, MARG, India |
| 11:00-12:00 pm | Panel Session Speakers: | SOCIETAL IMPACT Dr. Kevin Stolarick, The Martin Prosperity Institute Dr. Amit Kapoor, Institute for Competitiveness, India Mr. Doug Chambers, Director, Senes Prof. Nemy Banthia, CEO, IC-IMPACTS |
| 12:30 pm | Lunch Keynote Speaker | Hon. Dr. Asha Seth Member of the Senate of Canada |
| 2:00-3:00 pm | Panel Session Speakers: | POLICY Mr. Don Stephenson, Chief Negotiator, DFAIT Dr. Amit Kapoor, Institute for Competitiveness, India Mr. Peter Sutherland, Canada-India Business Council |
| 3:00-3:15 pm 3:15-4:30 pm | Health Break Panel Session Speakers: | GOING FORWARD Mr. Douglas Goold, Director, Asia Pacific Foundation Canada Hon. Frank Scarpitti, Mayor, City of Markham Mr. Sunil Tandon, MD, Ariston Group of Companies Prof. James McKellar, Schulich School of Business |
| 5:00 pm | Closing Remarks | Dr. V.I. Lakshmanan Co-Chair, Canada India Infrastructure Forum Chair, Canada India Foundation |
| 5:15 pm | Vote of Thanks | Mr. Jay Minhas Co-Chair, Canada India Foundation |

“Evolution of National SMART Waterways GRID leading to sustainable prosperity of the nation”

By - Dr APJ Abdul Kalam (apj@abdulkalam.com) & V. Ponraj (vponraj@abdulkalam.com)

Introduction

For economic development India has adopted multiple route since the inception of the 5 years plans. India has adopted two fundamental routes for promoting agriculture and water management which is the foundation for various phases of economic development. The first route for the 3 decades after independence is to build major Hydro DAMs, Reservoirs, tanks, lakes for better water management and hydro power generation to accelerate the 3 sectors of the economy. This initiative has resulted into building 84 major Dams and reservoirs which can store only 150 BCM of water every year. The next route was initiated by Dr KVL Rao and Captain D.J. Dastur on Interlinking of Rivers and Contour Canal. Subsequent to the national discussion, various studies have brought out the fact that it has lot of technological, environmental, financial and political leadership challenges, which has not taken a shape so far for realizing its implementation, even though it is a vital and important project for the nation. With the experience of these two routes and its challenges known to the nation, we the authors of this paper were searching for a new and innovative solution.

We have studied the India's water management problems with reference to the present capacity and its water balance. India gets approximately 4000 Billion Cubic Meters (BCM) of water every year from all natural sources. Out of this 700 BCM are lost in evaporation and another 700 BCM are lost during the flow on ground. Also, the large part of water namely 1500 BCM flow into the sea due to floods every year. Thus, the remaining available water is only 1100 BCM. Out of this ground water recharge accounts for 430 BCM per year and the present utilized surface water is 370 BCM. The balance unutilized water which can be harnessed is 300 BCM. We have also studied the “Interlinking of Rivers” programme and visited many countries to study the way they manage the water, rivers, and flood & drought conditions successfully. We have studied the USA's Mississippi, Ohio Rivers systems and its networking of waterways; we witnessed how Canada and USA had an experience in the creating waterways through the Welland Canal which bypasses the Niagara River and Niagara Falls between Lake Ontario and Lake Erie; Also we studied how the waterways and water management is done in Northern Ireland and Netherlands.

In India, a new thought is emerging, as a third solution called “National Waterways”. After studying all these options, we have come to the conclusion that the right solution for India is to establish the “National Smart Waterways Grid Mission”, which will connect the rivers, Dams, Reservoirs and catchment areas at a particular height to use the flood water and to issue the flood water on demand at any deficient region in the country. Our paper on “Smart Waterways for India” gives possible solution for generations of India on Water management in all conditions.

Let us explore the three routes now.

- **First route – DAMS and Reservoirs**
- **Second Route – Interlinking of Rivers**
- **Third route – National Smart Waterways**

Harnessing the Water

Hence our aim should be to channelize the 1500 BCM of flood water, so that it can be made use of for providing water to drought affected areas and make sufficient water available to the whole country during non-monsoon months through proper linking, storage and distribution.

Ohio Smart Water Ways

In April 2010, we were in USA, primarily to take a course titled “Evolution of Happy, prosperous and peaceful societies” at Gatton College of Business and Economics at University of Kentucky. Apart from teaching assignment, I was interested to know, how Ohio and Mississippi river basins have managed for flood control and smart navigation. In this context, we studied how the Corps of Engineers of the US Army has responded to changing Defense requirement and played an integral part in the development of the country’s infrastructure, from the time it was established by the decree of order by First President of the United States, George Washington in 1775.

Waterways in Canada and USA

A large proportion of goods carried in Canada, in both domestic and international trade, uses water facilities for some part of its journey. The inland shipping routes are dominated by the 2,342-mile (3,769 km) St. Lawrence-Great Lakes waterway, which provides navigation for vessels of 26-foot (8-metre) draft to the head of Lake Superior. It includes the major canals of Canada.

Indian Inland Waterways Authority

India is also having an Inland waterways for about 4,332 km and it have been declared as National Waterways (Ganga 2597km). About 70 000 000 tons/year. Water transport is one of the oldest means of transport in India but not very popular in the country. This is mainly due to seasonal concentration of rainfall and many times it is dry since it is often due to the flow of the river whenever there is a rain or flood, except Kerala waterways which is blessed with backwaters and inland water resources.

The Possible Solution: National Smart Waterways GRID

Implementation of National Smart Waterways GRID across India with the following characteristics to harness the 1500 BCM of Flood water. This National Smart Waterways Grid will become a National Reservoir and will use at least 600 BCM out of 1500 BCM of flood water which goes to sea every year. It will act as a National Reservoir for 15000 KM length. It may provide drinking Water – 600 Million people. Irrigation to 150 Million acres of land. 60,000 MW Power Generation. Due to ground water recharge it will save 4000 MW power. All India navigation for waterways transportation – which more than 10 to 20% fuel saving compared to Road Transportation.

Smart Waterways Project is a major economic accelerator

During our visit to Canada between 25-30 Sep 2010, we had detailed discussion with the leaders of Canadian Government and expert group on Water management and Infrastructure development, finance and economic development for Indo Canadian joint Venture Missions. The whole initiative was spearheaded by Canada India Foundation (CIF).

Conclusion

Ultimately, the National Smart Waterways GRID will harness the 1500 BCM flood water which goes to sea every year. The 84 major reservoirs in 5 regions of India is having only 150 BCM holding capacity. If we account for doubling the holding capacity then it can feed all of its river basins so that it may come around

300 BCM. Hence it is enough if we are able to harness 600 BCM from the flood and store it in the National Reservoir called “National Smart Waterways GRID” over the 15000 KM length. It will not only connect the rivers, dams, reservoirs and catchments at the ~ 250 Meter MSL, this will help increase the irrigation potential, navigation, power generation, tourism, fishing and also make the entire route of “National Smart Waterways GRID” an economic channel HUB which will eventually empower and enrich the 3 sectors of the economy and bring sustainable development of the nation.

The country has been blessed with great natural resources, abundant water and unlimited sunshine. We have failed to use these natural resources, abundant water and unlimited sunshine in a productive way. Hence we have made the nation dependent on foreign products for safe drinking water availability, dependent on coal, petroleum products and iron ore imports, and dependent on Solar power panels import from foreign countries. We have allowed exporting of our natural resource such as granites and minerals for value addition abroad, and importing it back to India instead of encouraging the Indian industries for value addition on these resources with proactive and inclusive policies. What had happened after the British invasions are happening now. We have liberalized our economy without empowering Indian core competent sectors with proactive inclusive policies for growth and not provided them the level playing field. Hence, majority of our native industries couldn't upgrade to the state of the art technological adoption, fiscal support and non-availability of skilled resources have seen the downfall and natural closure among the global competition. If we have adopted the inclusive policies which will promote the core competence of our country using our natural resources, then we might have prepared our industries to compete globally. For attaining sustainable prosperity, we need sustainable water, energy, infrastructure and agriculture. Let us focus on water first. Let us assure our people that we are for sustainable development and we will implement this mission. Let the creative leaders of this nation and states takes an oath that we keep the nation is bigger than individuals and hence we will give priority and implement “National/Statewide Smart Waterway GRID Mission. Yes. Evolution of National Smart Waterways GRID will lead to sustainable prosperity of the nation.

Reference Material

For more information on the above, please refer to the “Evolution of National Smart Waterways GRID leading to sustainable prosperity of the nation” paper written by Dr. APJ Abdul Kalam and V. Ponraj (1 Feb 2014).

Canada-India Collaboration in the Lucrative Infrastructure Sector

India's rapid economic growth over the last decade has placed tremendous stress on its limited infrastructure. The sector has received growing attention from the government and the public, bringing the shortage of infrastructure to the fore. Fulfilling India's aggressive economic growth aspirations would be seriously challenged due to this shortage. The country needs to urgently accelerate the conceptualisation and implementation of all its infrastructure development to enable planned growth. India needs US\$ 1 trillion investment in the infrastructure space (including roads, highways, power, utilities, airports, ports, urban infrastructure). 50% of this investment is expected to come from the private sector.

With the increasing need for accelerating infrastructure development to fuel India's economic growth, there can be no doubt that the EPC sector is in an advantageous position. Sectors including roads, oil and gas, and power have relatively higher construction opportunities since these segments have reached a relatively mature stage. On the other hand, sectors such as urban infrastructure, particularly water supply, waste management and urban transport system, are gradually gathering steam.

Recognizing the need for growth and development in this sector, the Indo-Canadian Business Chamber has taken steps to ensure appropriate engagement between India and Canada. There is a huge opportunity to collaborate in areas of infrastructure development and energy. India and Canada enjoy tremendous goodwill and have a flourishing bilateral relationship. As such, Canada is the "right partner" for India in developing and nurturing its energy and infrastructure requirements. There is a huge potential for growth as Canadian funds are keen to explore potential investments in India.

The challenges that India faces is how to create an environment to assure and protect foreign investors, to mitigate risks, provide de-risked projects to long term investors, to have stable and sustainable policy making, transparency and prompt implementation of regulations.

From India's point of view, policy initiatives are been taken – A Cabinet Committee on Investments and introduction of Infrastructure debt funds has been set up to expedite project development and encourage foreign investments. The Central Government has also committed to enacting a certain set of policy reforms that it hopes will speed up the infrastructure development process and improve the overall quality of infrastructure. These reforms find a place in the documents of the Planning Commission and in various acts. Some of these reforms are:

Decentralization: One of the bottlenecks to creating infrastructure in the past has been the high amount of centralization in government agencies. As a result, most decisions by high-level officials, who are heavily overloaded and are unable to take decisions on time. By decentralizing and devolving responsibilities to lower levels, the government hopes to improve the response time on infrastructure projects.

Increasing Accountability, Transparency: The government has initiated procedures to improve the transparency and accountability of departments and processes that influence the development of infrastructure. The aim is once again to enable the development of infrastructure by removing delays and bottlenecks.

India can therefore leverage Canada's superior technological expertise and project development and implementation experience. Both countries can be creative and initiate new methods of engagement.

I applaud Canada India Foundation on its continuous focus on Canada India relations from a policy perspective, through its Canada India Forums, the latest being the Canada India Infrastructure Forum.

Nadira Hamid

Chief Operating Officer
Indo-Canadian Business Chamber

INFRASTRUCTURE DEVELOPMENT IN INDIA: BACK TO BASICS

Infrastructure development is one of the crucial pillars of Indian government's strategy for economic growth. The Planning Commission treats ten sectors viz. electricity, oil & gas, roads & bridges, railways, ports, airport, telecommunications, irrigation, water supply & sanitation, and storage as part of infrastructure. The total investment in infrastructure as percentage of GDP has increased from 5.02 in the Tenth Plan (2001-2006) to 7.22 in the Seventh Plan (2006-2011) period. A target of US \$ One Trillion has been set for investment in infrastructure for the 12th Five Year Plan (2012-2017), being 9.14 per cent of GDP.

Given the diversity in the nature of different sectors, a generic treatment of policies and strategies for infrastructure development is difficult. It is for this reason that there is no formal infrastructure policy, and the efforts are focussed on managing key issues like financing, technology, project execution capabilities including public private partnerships (PPPs) etc. Policy makers do, however, face certain dilemmas across sectors like growth vs. environment/sustainability, State vs. market and economics vs. politics.

High priority has been accorded and efforts made across public & private sectors, professionals and experts, have applied themselves to find solutions for the major challenges in infrastructure development, focussing mostly on the macro picture and the complexities associated with big projects. Notwithstanding this, the actual pace of infrastructure development has been less than satisfactory. A different approach and a different focus appears necessary to supplement and reinforce the macro level measures already in hand. A "back to basics" approach, founded on three basic postulates, is suggested for this purpose. Institutional Infrastructure & Governance Reforms

The first basic postulate is that existence of appropriate 'institutional infrastructure' is a prerequisite for fast tracking of physical infrastructure development. This includes institutional arrangements for meeting key requirements like financing (through suitably designed and empowered financing institutions and instruments), technology acquisitions, project execution capabilities etc. The symbiotic linkage between governance and infrastructure has to be consciously recognized and necessary governance reforms undertaken. Administrative restructuring like having a single Ministry for energy sector encompassing electricity, petroleum, coal etc. may be necessary for effective seamless decision-making. The decision-making processes also need to be re-engineered, and driven by the right kind of mind-set. Investor confidence, so totally essential for large scale infrastructure development, will not be generated unless the decision-making systems are credible in terms of long term certainty and unambiguity.

The need for policy/institutional reforms for national, state and local agencies to collectively overcome a number of structural challenges like poorly defined bureaucratic structures/mission, insufficient accountability, poor asset/system management etc., have been recognized earlier also. The strategic goals, mission statements, performance indicators and responsibilities need to be clearly articulated. Accountability for policy and operational roles need to be delineated separately, and enforced with the help of independently verified information/data and analysis. Concerned organizations may need to be reinvented for this purpose.

Governance reforms will also need to put in place transparent systems and criteria for project identification/selection, including in terms of location of the project and selection of the concessionaire, and clearly stating criteria and process for renegotiation, (should the need arise due to uncatered for developments) at the initial project approval stage itself. Institutionalized mechanisms should be set up to take care of the concerns and interests of the affected communities/people at the drawing board stage itself, instead of treating them as problems or constraints to be tackled as part of the project execution phase.

Making Markets Work

The second basic postulates is that making markets work would facilitate better quality infrastructure development at lower costs. The very nature of infrastructure sectors is often presumed to limit competition and the number of market participants. Many of these sectors also have sectoral regulators. The markets, therefore, need to be assessed from the competition perspective and innovative strategies evolved for making markets function better. Various competition

issues need to be scrutinized closely by the Competition Commission of India to ensure fair play, in view the network characteristic of infrastructure involving provisioning intermediaries in the delivery process.

It is necessary to identify and segregate those layers in regulated networks where competition is possible, and the true remaining natural monopolies. Competition can then be introduced in the infrastructure market through appropriate restructuring programmes for more competition in the segments where it is possible, providing open access to the natural monopoly type bottlenecks, awarding monopoly franchises competitively, adopting competition friendly formats for Public Private Partnership Agreements etc.

In this context, it may also be useful to encourage and develop more market participants. Apart from developing more big size promoters/ vendors/executing agencies in the mould of the present ones, creation of smaller markets in the value chain particularly at the retail level, with more small medium industries getting involved, may be useful.

Convert Stakeholders into Shareholders

The third basic postulate is that stakeholders' involvement is absolutely essential for success of infrastructure projects. The projects are huge and complex, involving a wide variety of organisations and individuals, with different roles, interests and backgrounds. High quality time-bound execution of the projects is not possible without the interests of all these stakeholders being reasonably well aligned to the project goals and strategy. Some of the stakeholders like the government, financing institutions, major investors and the project execution agencies have a say in the design and execution of the project, and are able to ensure that their interests are taken care of. Even these, however, think in terms of their individual interests, at times at the cost of harming the interests of others. A sense of partnership for maximising the project efficiencies and outcomes, which would in turn benefit each of them, is sometimes absent.

It is ironic that the local communities and individuals, whose lives are most directly and immediately impacted by project execution, have little say in the project planning and implementation. No wonder that they often strongly oppose, and at times bring to a halt, project execution when it affects them adversely, be it in terms of displacement, loss of livelihood or environmental degradation. Their interests do not find any place in the goals of the project. There is no effort to make them partners in the task of infrastructure development. We need to develop a new paradigm for co-opting all stakeholders as partners in infrastructure projects, converting them into shareholders (not financially but in decision-making) in terms of involvement. These shareholders should then hold governments, promoters and executing agencies effectively accountable. Governments and large companies all over the world respond far better in terms of outcomes for stakeholders/shareholders when they are actually held accountable for performance even in the short-medium term.

It may be useful to create a platform for all stakeholders to come together in a partnership initiative to significantly accelerate infrastructure development in India. The platform would need to exert sustained pressure for effective delivery on governments and institutions. The platform would be as alert and aggressive as enlightened shareholders in a company, and may be serviced by professionals. Given the importance of infrastructure development for economic growth, the platform should mount a major public awareness campaign through print, electronic and social media with an appropriate slogan like "India for Infrastructure". The Canada India Foundation could consider taking the initiative to set up an Indo-Canadian Infrastructure Network (ICIN) for this purpose.

Mr. Anurag Goel

Member of the Competition Commission, Government of India

Opening and Keynote Speakers at the Forum



Hon. Tim Uppal,
Minister of State for Multiculturalism,
Government of Canada



**His Excellency Admiral (Retd)
Nirmal Verma,**
High Commissioner of India in Canada



Hon. Eric Hoskins,
Minister of Economic Development,
Trade and Employment,
Government of Ontario



Hon. Glen Murray,
Minister of Infrastructure,
Government of Ontario



Hon. Yasir Naqvi,
Ministry of Community Safety and
Correctional Services,
Government of Ontario



Hon. Teresa Wat,
Minister of International Trade,
and Minister Responsible for the
Asia Pacific Strategy & Multiculturalism,
Government of British Columbia



Mr. Patrick Brown,
M.P., Co-chair, Canada India
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Hon. Dr. Asha Seth,
Senator, Government of Canada



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Canada-India
Centre for Excellence

Jaswinder Kaur,

Director, Canada India Centre for Excellence, Carleton University

Uday Modi (FifthFebDesign)

designs@fifthfeb.com
(416) 875-2949

Zan Nichol, PSAV Presentation Services

znichol@psav.com
(647) 788-8299

Kalinda Kripwell, Events Manager, Shangri La Hotel

kalinda.kripwell@shangri-la.com
(647) 788-8880

and the staff at Shangri La Hotel

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