Brainstorming Discussion Meeting on Science Diplomacy on 12th May, 2016

PROCEEDINGS

Organized by

Climate Change Research Institute

TRCSS

Trans-disciplinary Research Cluster on Sustainability Studies


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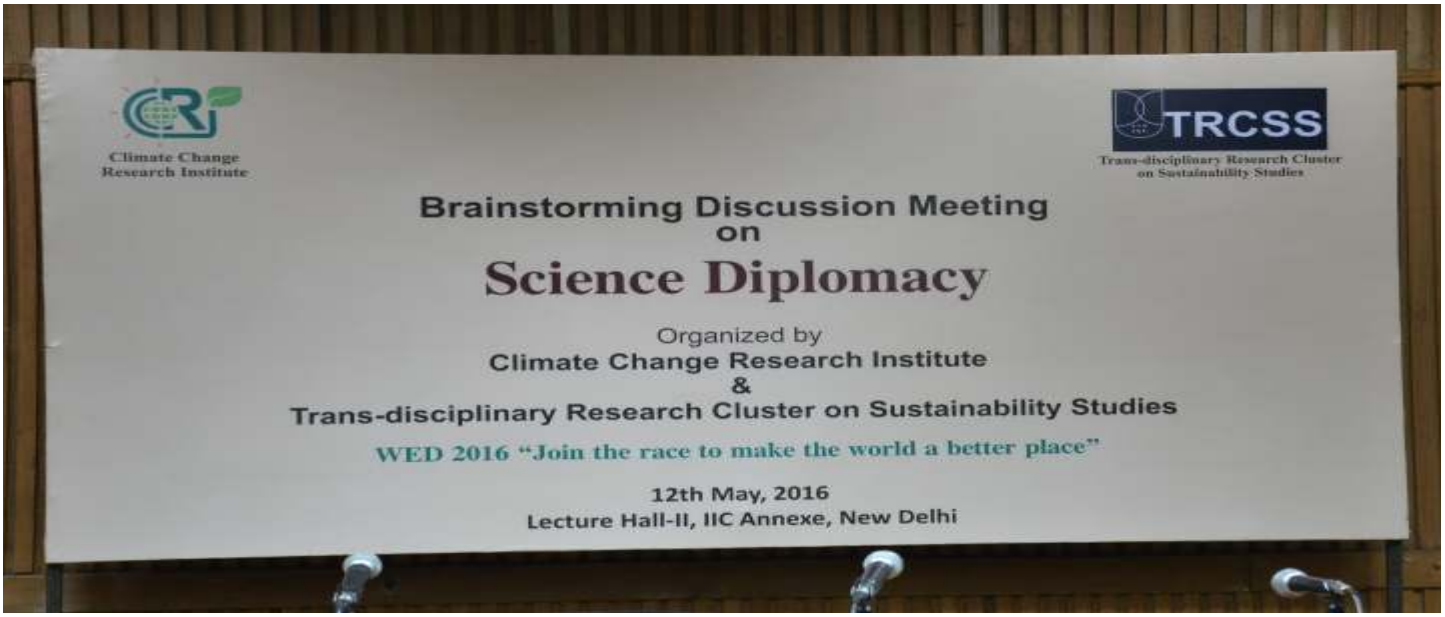
Brainstorming Discussion Meeting
on
Science Diplomacy
Organized by
Climate Change Research Institute
&
Trans-disciplinary Research Cluster on Sustainability Studies
Dr. (Mrs.) Malti Goel
Dr. D. P. Agrawal
Dr. Kavita Sharma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WED 2016 "Join the race to make the world a better place"
12th May, 2016
Lecture Hall-II, IIC Annexe, New Delhi


TRCSS

First 'Environment and Earth Care' Lecture

&

Brainstorming Discussion Meeting

On

Science Diplomacy

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12th May, 2016

India International Center

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Trans–Disciplining Research Cluster in Sustainability Studies

Preface

Science diplomacy in foreign policy is important in providing new opportunities for collaborations and improving relationships among the countries. A **Brainstorming Discussion meeting on Science Diplomacy** has been organized by Climate Change Research Institute Jointly with Trans-Disciplining Research Cluster in Sustainability Studies (TRCSS), JNU, on 12th May, 2016. The meeting was held at India International Centre, New Delhi. The focus was on what should be the trajectory of science & technology cooperation for growth towards sustainability for enhancing diplomatic relations within South Asian Countries.

I profusely thank Prof. D. P. Agrawal, Former Chairman UPSC, and Chairman GC, CCRI for delivering the Welcome Address. We are thankful to Eminent Panelists; Prof. Pranav N. Desai, Project Coordinator TRCSS; Prof. Kavita Sharma, President, South Asian University; Sh. A. B. Agarwal, Executive Director NHPC; and Sh. R. K. Sharma, Scientists 'E', DST. I thank Sh. Gautam Sen, Consultant, Oil & Gas and Ex-ED, ONGC who made concluding remarks. The discussion topics included:

i. Knowledge Networking
ii. Hydropower
iii. Cultural Diplomacy
iv. Science & Technology, Research and Collaboration
v. Education

I am extremely thankful to Dr. Nafees Meah, Director, RCUK, British High Commission, who graced the occasion and said that idea of working on SAARC countries is interesting and there should be momentum on that. Our thanks are due to encouragement and support from Indian Council of World Affairs.

Dr. (Mrs.) Malti Goel
President
Climate Change Research Institute

First 'Environment and Earth Care' Lecture

&

Brainstorming Discussion Meeting On

Science Diplomacy

Venue: India International Center

12th May, 2016

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Climate Change Research Institute, India

Brainstorming Discussion Meeting on Science Diplomacy on 12th May, 2016

Executive Summary

The Climate Change Research Institute (CCRI) organized a brainstorming discussion meeting on 'Science Diplomacy' jointly with **Trans–Disciplining Research Cluster in Sustainability Studies (TRCSS), JNU** at IIC, New Delhi. The first brainstorming discussion on Science Diplomacy in South Asia was held on 12th May 2016.

Dr. (Mrs) Malti Goel, President & CEO, Climate Change Research Institute welcomed the participants and distinguished guests. She talked of role of Science & Technology in Science Diplomacy, its importance, examples of various models and a brief background of South Asian countries. South Asia comprises of eight countries located within latitude of 3-33^{o}N and longitude 65-90^{o}E. Seven neighbor countries occupy 1.932 msq.km^{2,}, which is 60% of India's total area. She then raised few questions which could be addressed.

Prof. D. P. Agrawal, Ex Chairman UPSC said that Science diplomacy is crucial subject and we must safeguard interest of people who are partners in diplomacy. He cited the example from SAARC, countries when as Chairman UPSC he persuaded the members to initiate a dialogue for the welfare of the societies and brought out a best practice compendium. He wished today's deliberations a success.

Prof. P. N. Desai, Project Coordinator TRCSS & Director SASH & KN, JNU delivered the Keynote Lecture and said that development of productive linkages is prevented due to socio-economic, political, historical and technological factors. International innovation system also plays a role. He touched upon the transformation of the innovation process and the need for international collaboration irrespective of the size of the investing country on R&D.

Dr. Kavita Sharma, President, South Asian University questioned the very sense of diplomacy. She opinioned that in Science Diplomacy one should try to achieve team work for solving human problems with science taking a centre stage. We have a shared geography and therefore Climate Change and Environment are the topics to get benefits of science diplomacy.

Sh. A. B. Agrawal, Executive Director, NHPC talked about diplomatic relationships in hydropower among South Asian countries. SAARC countries have potential of 3.3GW but only 15% of it has been developed. He described India's efforts with Bhutan, Nepal and Afghanistan and there is going to be a huge scarcity of water, if ties are not strengthened for mutual benefit.

Sh. A. K. Jain, Ex. Commissioner (Planning) DDA said India has a long history of cultural diplomacy since 2500 years when Buddhism spread all over South East Asia. He gave many examples and recent example of building of Supreme Court in Bhutan. There should be professional cadre of diplomats to enhance mutual understanding and growth.

Sh. R. K. Sharma, Scientists 'E', DST gave the background of S&T Collaborations in DST with 80 countries. He also said multi-lateral collaborations are on rise including that of SAARC and ASEAN. He said there is a feeling that our scientists and bureaucrats are not serious to get benefit of science diplomacy. He also said that DST would welcome all policies related to science diplomacy.

Dr. Nafees Meah, Director, Research Council UK, British High Commission talked about UK's commitment to global challenges. He said idea of working on SAARC platform is interesting and there should be momentum on that. More effort should be made to address issues of common nature like energy, water etc. to develop regional hub under SAARC Science Diplomacy.

The concluding remarks were made by Sh. Gautam Sen, Member, GC, CCRI. The meeting ended with vote of thanks.

INAUGURAL SESSION

Guest of Honor: Prof. D. P. Agrawal, Chairman of GC, CCRI & Former Chairman, UPSC

Dr. (Mrs.) Malti Goel

CEO, Climate Change Research Institute
Former Senior Adviser, DST

Introduction to Theme

1. I welcome distinguished guests on-the-Dias and off-the-Dias for this Brainstorming Session on Science Diplomacy and Neighborhood Countries. We would focus on how we address the role of Science & Technology in Science Diplomacy. We often talk about 'Foreign Diplomacy' which is between the two governments according to the foreign policies and laws of the countries. We hear about 'Economic Diplomacy' (development partnership and not merely the financial Aid), 'Public Diplomacy' (holding conferences & seminars or literature festivals), 'Cultural Diplomacy' and also 'Sports Diplomacy'. The 'Science Diplomacy' is somewhat new because not much is talked about it.

2. At Present India's foreign policy is to encourage regional development through cooperation with the neighboring countries. A lot of new initiatives are being taken in problem solving approach. Yet in a competitive globalized world, an international cooperation may or may not include science diplomacy. How we can go about it? The Climate Change Research Institute and TRCSS have jointly taken the initiative to organize the discussion meeting on Science Diplomacy in South Asia. 'Science Diplomacy' has come into limelight in the last few years as far as developing countries are concerned. We can understand it as non-violent approach to manage the international relationships better. It is also be seen as conflict solving approach with application of science for development. Various models for science diplomacy exist today namely;

- Science in Diplomacy
- Science for Diplomacy
- Diplomacy for Science
- Diplomacy for Technology

3. First three are described in the literature, and fourth is being proposed here. In each of these there is some merit. The end of Cold War era among the big powers of world during 1990s is attributed to 'science in diplomacy'. A most cited example of 'science for diplomacy' can be of gas pipeline connecting from Iran to India via Afghanistan and Pakistan. In a problem solving approach it would be a good way to initiate science diplomacy between India and Pakistan. As such it requires intensification of science & technology driven links among the countries for attainability of goals.

4. 'Diplomacy for Science' on the other hand aims to facilitate in international cooperation for a common goal. The International Thermonuclear Experimental Reactor (ITER) in France is an example of Diplomacy for Science with 37 institutions across the world and hundreds of scientists participating in it. Inter governmental Panel on Climate Change (IPCC) is an example of International 'diplomacy for science'. In it government nominated scientists form recommendations which are being used for international negotiation of climate change actions. In the context of Paris Agreement, much action will depend on political willingness and diplomatic processes on the parts of both developed & developing countries.

5. Climate Change shares a common space with the countries in the neighborhood. Climate Change being one of the issues which encompass all disciplines of Science, Technology, Engineering and Social Sciences to have a sustainable growth, at present the issue of funding, climate change mitigation actions and technology transfer remain grey areas which need to be sorted out. 'Diplomacy for Technology' can facilitate international cooperation with the goal of achieving technology transfer. Among advanced countries and developing countries there is a greater need for Diplomacy for Technology. Climate Change Protocols can make it a success.

6. Coming back to South Asia, it comprises of eight countries located within the Latitude of 3°-33° N and the Longitude of 65°- 90° E. India occupies land area of 3.28 msq.km and has border contacts with all. The seven neighbors have an area of 1.932 msq.km, which is approximately 60% that of India. In terms of population, India has 70% of the population of the region. In South Asia comprising of almost 1/3 population of the world, countries with shared space, and shared challenges like climate change, clean energy or knowledge networking require strong interactions and joining hands. Challenges are many and science diplomacy is an evolving policy. We need to develop system for the growth of this 'Art'.

7. I may add that this is among the first Brainstorming meeting about Science Diplomacy in South Asia. I had the honor to participate as Science Diplomacy Ambassador for 'Energy Policy Innovation' Workshop held in Italy in 2013, organized by TWAS for developing countries. This has given me an incentive to apply it into practice.

8. We have very eminent panelists having direct exposure to the issues in cooperation with South Asian countries. Prof. Pranav Desai at the Jawaharlal Nehru University has initiated a knowledge hub of Sustainability on South Asia. Dr. Kavita Sharma, President, South Asian University is amongst us, Sh. A. K. Agrawal, Executive Director, NHPC and Sh. A. K. Jain, Ex-Commissioner, DDA are other distinguished panelists. Sh. R. K. Sharma, Scientist 'E' is representing the Department of Science & Technology, who is first to begin a program on Science Diplomacy. Prof. D. P. Agarwal, Chairman Governing Council and former Chairman UPSC would enlighten us with his experience on this subject.

I now have the honor to request Prof. D. P. Agrawal to give his address and words of wisdom.

In the Panel discussion today some of the questions may be addressed are;

- What are the priority areas where sectoral / S&T strengths and level of knowledge of each of the countries has been shared?
- What should be modus operandi in building trust towards a common goal?
- How India can leverage its knowledge and skills to enhance diplomatic relations within South Asian countries?
- Does India have a policy on Science Diplomacy?

Prof. D. P. Agrawal

Chairman, GC, Climate Change Research Institute
Former Chairman, UPSC

Welcome Address

1. At the outset on behalf of the Climate Change Research Institute, I welcome you all and my thanks to what Dr. Malti Goel said. As she spoke of very crucial subject in science diplomacy, I also thought there are many different areas, which need to be addressed. Firstly, science diplomacy is nothing new, it has happened in earlier years. It has pick up again in 1970's and 1980's by the developed world. Science & Technology has a group which has science diplomacy within, while the other group doesn't have it. Those countries which have advanced knowledge in Science & Technology have an advantage. Any Science & Technology negotiation or diplomacy must safe guard the interest of people, who have not acquired this level of development.

2. Today we talk of energy, transport systems and of linking people through voice, picture, media, etc. No aspect of life remains untouched from information technology. For the growth in economic development of a nation, Science & Technology plays a greater role. The diplomatic policy is not yet very clearly established, but what is established is that a thought for solving human misery, over coming poverty, control of diseases and other solutions possible through application of Science & Technology. The question therefore is that, all the SAARC member countries though culturally similar, are not same. India is a big country as already mentioned not only in size but also in terms of developed technology. In certain areas Pakistan is competing with us, but in many areas we are far different than what they are. Therefore within this group there would always be a possibility that two of them may not come to a common consensus on many issues, which may be crucial for developing relationship.

3. The SAARC Charter gives us some insights into what we are really looking for. I would read two points; the point 1: It is desirous of promoting peace, stability, unity and progress in the region through strict adherence to the principles of United Nations Charter of non alignment, particularly the respect for the Sovereign Equality, Territorial Integrity, National Independence. Point 2 is about non-use of force and non-interference in internal affairs of other nations in peaceful settlement of all disputes. The objective of SAARC is to promote the welfare of people. There has been one danger that in science diplomacy there is possibility of subjugation of other nation by those who have the technology. We have seen it is nothing new for us, we were not provided a super computer. There are some other challenges when we look at in terms of science diplomacy. Science is not always seen for the growth & development of society, it can also cause destruction for example "Hiroshima" in Japan during World War II. Diplomacy is nothing but to bring two people or countries together with each one looking their own interest through a process of negotiation and a negotiate common framework.

4. Science Diplomacy has to make to fulfill the needs of countries for the benefit of the people. For example, in scientific development what is good for that country and may not be good for our country. Bio-GM food has been taken as a requirement for food security. However, still in India there is debate going on whether to accept it or not. Japan at one time gave technology to everybody and also provided lot of funding for exchange of ideas to spread diplomacy. India has entered into many dialogues in terms of science & technology relationship with different countries. I give you an example from SAARC. When I was Chairman of UPSC, it was noted that the only dialogue with SAARC was its annual conference. I tried to convince the concerned Ministry and Government that through SAARC we should come closer and understand each other, not at bureaucratic level but for the welfare of the societies. Most of the good schemes of the government for welfare could not be translated through the process of the governance and there is need to understand each other better.

5. One of the finest examples was that public service commission in those countries can influence the youth of the country having gone through a route of education, science & technology and development. We began a dialogue between all the Chairmen of the respective public service commission of those member countries. First meeting was held in Delhi. In this meeting it was said that we are not here to get only India's experience. We are sovereign nation, we are here to benefit from each other. Now that is the level of

mistrust in the SAARC's countries. It was an interesting dilemma; I was able to successfully overcame it. I am happy to add that five conferences have been held so far and, we understand each other much better. A compendium has been produced of what are the best practices in re-employment and selection processes. So learning was that t may not work, if we take big brotherly attitude. It has to be togetherness, respecting others. Should our interest be paramount or should corporation be paramount is an important issue. I am sure that in this deliberation we get at least some excellent points for science diplomacy in which we can move forward.

Thank you

Prof. Pranav N. Desai

Professor, Centre for Studies in Science Policy, Project Coordinator, TRCSS & Director, SASH & KN, Jawaharlal Nehru University

Keynote Address and First EEC Lecture

1. Good afternoon everybody, I congratulate the Climate Change Research Institute for initiating this discussion, which is so close to my heart. Dr. Malti Goel said science diplomacy is a new dimension in international policy and that it is becoming more significant in today's world. Rapid changes there are taking place due to globalization and emerging technology like biotechnology, nanotechnology, information technology and international environment movements are dominating all fields. In this context, Science diplomacy has become more crucial as far as climate change is concerned. It reminds me of famous German sociologist Ulrich Beck who said that climate change is 'emancipatory catastrophism.' It is emancipatory because it has given a big shock that has forced us to think differently and think radically. The way we relate to the environment, the way we relate to science and society. Hence, it is imperative that we think differently about science diplomacy.

2. International Corporation in science and technology has been one of the instruments to operate our diplomatic science relations. Recently, United Nations has announced seventeen targets of sustainable development goals. Health and poverty are major global problems, and these are some of the challenges even South-Asia faces. How do you tackle this issue through science & technology and innovation? How do we transform our innovation process so that we meet the sustainable goals? Usually, the criteria for which we enter into International Corporation in science and technology can be; first is setting the internal goals of science and technology for optimization of resources to keep abreast with knowledge and for availing technologies that we don't posses. The other is certainly socio-economic objectives like the removal of poverty and many other problems we face related to say energy, water. There are many other regional and global goals we pursue and these political and diplomatic objectives.

3. Looking at the history of International Corporation in science and technology, most of the times scientific objectives were subordinated to diplomatic objectives. The important objective that a country should have is to strike a fine balance between these objectives in pursuing science diplomacy or technology diplomacy. How do we strike a balance between three objectives in international collaboration? There are different ways of collaboration such as

- Bilateral collaboration between two countries
- Regional collaboration like we have SAARC here and then there are many other regional blocs
- We also have the multilateral collaboration that takes place under the aegis of United Nations and specialized agencies.

4. The question is have these collaborations, multilateral or bilateral, benefited the developing countries? Whether these efforts have provided intensive knowledge thrust or given rise to some new technologies in South-Asia. We have the specific situation and specific kind of technologies that we can use for our economic growth. On the one hand, we say that most of the poverty is concentrated in terms of absolute numbers in South-Asia and another region like Sahara, Africa. But at the same time we don't look at our strength like South-Asia may be rich in a bio-diversity. The Rio conference has allowed that sovereign rights to national resources to all the developing countries. We should look at the strength also, and in science diplomacy, we should use this strength for bargaining.

5. The development of productive linkages are possibly prevented not only due to socio-economic, political, historical and technological factors but also due to the structure of international innovation system tilted in favour of those where science & technological (S&T) infrastructure is concentrated. The international system of innovation (ISI) is characterized by its hierarchical and also historically structured relationships. Furthermore, it is essential to note that this innovation process is mediated through dependencies emanating from the international S&T order and interdependencies generated by the globalization process. Emerging technologies. Bilateral cooperation in S&T between India and Africa, the multilateral collaboration between BRICS, ISBA, and the African countries provide interesting examples to study the South-South collaboration in the changing international system of innovation. It is contended here that international collaboration does not take place in a vacuum, but it is structurally embedded in a definite international innovation system. Some of these organizations are emerging as countervailing forces against the established international organizations such as IMF, World Bank.

Transformation of Innovation Processes

6. In the initial period, India's collaboration efforts were concentrated in the developed world. Now, we have more diversified collaboration in terms of geographic as well as science & technology areas. Most economically useful kinds of knowledge have a tacit dimension and that such knowledge can only be obtained in a social process of interaction. Some of the factors contributing to this phenomenon are: unfolding of globalizing forces including changing nature of emerging technologies, heightened significance of national and international S&T collaboration and changing nature of international innovation system. In 2000, 574 new technology or research alliances worldwide were reported in six major sectors: information technology (IT), biotechnology, advanced materials, aerospace, and defense, automotive, and non-biotechnology chemicals. In many countries, the diplomatic objectives have overbearing influence, or socio-economic and scientific objectives are subordinated to political, diplomatic objectives. Even the other type of cooperation like multilateral cooperation or bilateral Official Development Assistance had similar nature of cooperation and agriculture remained the top priority. Hence, India had no other options but to depend on the transnational cooperation (TNCs) for other productive sectors.

7. A need was also felt to create a permanent organizational mechanism after growing interest in international S&T cooperation with some of the countries like USA, France, Uzbekistan and the Non-Aligned Countries. This mechanism was perhaps created to involve greater commitment and insulate international S&T cooperation from ups and downs in the diplomatic relations. Prof. Agrawal just mentioned about subjugation, from where would the subjugation emerge? It would emerge from those very International science & technology order or international system of innovation. This is like an inverted triangle where most of the science and technology resources are concentrated at the top in the developed countries. It tapers down where most of the population is concentrated in the developing countries. The developing countries will require not only higher investment in S&T but take advantage of science diplomacy as well for augmenting these resources to move up in the innovation ladder.

8. It is the science & technology institutes/organizations that possessed greater human resource and greater science & technology capability that attracted greater collaboration, and as a result it is the developed countries that benefited more by utilizing our resources. Because this idea of optimization resources was not pursued; i.e., how we can complement our resources, was not pursued in our science diplomacy. This

concept is now slowly changing with three forces namely; globalization, emerging technologies and awareness about global environments change. Earlier nature of science and technology collaboration was confined only to scientific research. The idea of taking it up to innovation process or linking it to productive forces was not there. In the recent period, international collaboration agreements are not simply entered into for scientific research but extended up to innovation level. In Asia, the scientific resources are concentrated in very few countries like Japan, India, and Korea. Looking from the historical sketch of the last 60 years, India now has collaboration with more than 100 countries from all parts of the world. The proportion of the non-align countries is much higher. This indicates how political objectives play a greater role in determining collaboration rather than other needs. During the globalization, private channels are a new dimension that is emerging in the developing countries.

FDI and Technical Collaborations

9. In India, the policy governing outward FDI has been progressively liberalized which has resulted in changing destination and structure of OFDI. This geographical and sectoral shift illustrates greater technological competence through learning and not only a result of liberalization. In the pre-liberalization period, the FDI pattern revealed a higher level of technical cooperation and this pattern reversed after the mid-nineties with a higher level of financial over technical collaboration. In the second stage of global generation of technologies, the TNC's R&D activities have more or less remained confined to the developed countries. As far as the Asian Developing countries are concerned, countries like Korea, China, Malaysia and Thailand had a significant level of technical collaboration.

10. The collaboration network is expanding to private institutes and universities, who are major actors in knowledge production. Another dimension which is mainly between private enterprises and exports; the R & D is intensified, even the technological learning that took place in the past has helped us to diversify our collaboration. With the experience and changing economic environment, our companies are setting up their units in developed countries like US, Italy or many others countries. India has also become one of the participants in Outward Foreign Direct Investment (OFDI). It is both ways, we are also receiving FDI and also invest abroad because many companies have business outside, Tata Steel is an example. What they are buying or what Indians companies are looking for if the developed R & D infrastructure. What they bought was their advanced R & D, that is why it is called smart collaboration, and that is what the developing countries would be looking for. On the other hand, the developed countries are more interested in markets.

11. Many of the Asian countries like Korea, Malaysia, China and Thailand who were never a significant player in the earlier period, but now they are emerging as one of the significant key players. The R &D part was the most unfragmentable component of the MNCs, and that part was never setup in developing countries, but now in this globalized world, developed countries are setting up many R & D units in developing countries like India and China.

12. Finally, the whole environment of science diplomacy and international collaboration has changed in favor of some of the developing countries. As a result, they have now gained bargaining power with the emergence of bio technologies and other emerging technologies. Also when some of the international organizations become rigid, what you see is the emergence of countervailing forces.

Summary

- The process of globalization has promoted greater complexities into the national innovation system and international cooperation. An element of fierce competition, nature of emerging technologies associated with greater risk and uncertainty, shortage of highly skilled S&T human resource and bio-resources are overshadowing other determinants like cost, geographic proximity and cultural affinities, market conditions.

- During the period 2001-10, India has witnessed a steady increase in co-authorship in international collaboration in scientific publications reflecting increasing significance of international collaboration and the fact that collaboration is attracted by the developed S&T infrastructure and not deterred by any cultural, linguistic or geographic differences or size of any country.

- Need for collaboration is felt irrespective of size of the investing country or R&D. However, the R&D flows are directed towards countries with developed R&D infrastructure and availability of human resource irrespective of geographical proximity. The TNCs from the European and Asian countries are also forming global R&D network by partnering in India. Thus, geographical boundaries of the NIS are getting blurred.

- The Asian TNCs had no training programs for their R&D employees, which reflects the suitability of S&T human resource. However, compared to the developed-country TNCs, these companies had limited interactions with the local R&D organizations in terms of contract research, collaboration with universities and firms. Some significant knowledge spillovers are expected from this activity. To take advantage of these benefits, India will have to gear S&T policies towards facilitating such knowledge flows.

PANEL DISCUSSION

Science for Diplomacy

Chairman - Prof. Pranav Desai, Professor, Centre for Studies in Science Policy, Project Coordinator, TRCSS & Director, SASH & KN

Dr. Kavita Sharma

President,
South Asian University
New Delhi

Education Diplomacy & Cultural Diplomacy

1. Thank you Dr. Malti Goel for inviting me to this Brainstorming discussion on South Asia. I am not really a scientist or technologist, but I am heading the South Asian University, which is directly concerned within eight South Asian countries. We are connected with education for a long time and internationalization of higher education for seeing about 15 to 20 years. 'Education diplomacy' is a field which has not got as much attention as cultural diplomacy has had. Although education diplomacy has a far reaching impact because it deals with ideas and connects with young students.

2. What do you mean by Science Diplomacy? When we leave it to politicians and bureaucrat cadres then this comes down to regional dominations. The World is becoming *Flat* and several things have led to it. The end of the Cold War, collapse of the Soviet Union, the globalization, information technology which has literally shrunk the world and created an impact in which by touch of a button one can connect thousands of people. Globalization itself comes from capitalism and there are many shades of capitalism. It also comes from democracy and therefore, people have become center stage. This form of talk of peoples, communities, things which were in the realm of sovereign nations are now in international regime. Something as private as marriage, divorce, maintenance, all of these now are governed by international conventions. Many countries give the right to nations to go directly beyond to complaint against their own state in the international court of justice.

3. We do not have to travel to another place in order to work at that place. Before me, eminent panelist speakers laid out a lot of the road map on what we are trying to achieve. We are really trying to achieve is to solve human problems with team work, in which science takes the center stage. It really means that we need to put human beings before

The governments and collaborations. The fact remains that a lot of SAARC organization has closed down in spite of lot of noise have been made. We all know how education diplomacy has worked because the PL 480 funds then used by us to plan IIT's, ITI's and Agricultural Universities. In those days thousands of teaching hours that American Professors spent here and the thousands of hours that Indian teachers went abroad for training. Already there is lot of work being done on science diplomacy in USA. The important thing is to devise strategy for collaboration. It was also seen that even when the Indo-US relationship were at a low, dialogue was kept on because of universities collaboration and common research platforms.

4. My plea would be to make a high pitch for collaborations among ourselves. From my experience in South Asian university, the SAARC region has potentially the highest demographic dividend that it can cater to many young people. The education level is poor, even the gross enrolments ratio is poor, however, we have a shared geography and therefore climate change and other issues of environment obviously become center stage. We also have a lot of mistrust with each other and no matter what India does; being the largest country with sharing borders with most everybody else, it is not received well. India being three times of the economy of all of them combined, 70 % of the population and of course way ahead of the other seven countries around.

5. I believe that India has taken a lead in the Vaccines areas, food, energy production. Science is required for technology, industry, trade, energy, health solutions, agriculture, preservation of natural resources and in education. With technology available if we collaborate right from the beginning in education then we can learn about each other better. Scholars, researchers, scientist, universities, science academies they can all collaborate and built common platforms. As 90% of funding still comes from developed countries and although it may be changing, but most of the scientists also take pride in joining the western platform. We do not ask the research questions to solve our problems. We have to accept that solutions found in the West may not be applicable to our countries. Our scientists are not serious to get benefit of science diplomacy. I imagine that there is a two way space, one is that scientists have to speak to the policy makers and those who could have a conversation with public. There is a room for democratic space where the scientists come and tell us what they are trying to do and how it would affect us. This dialogue would be very valuable because it is the communities that know their strength and weakness. They would be able to say what would work, what would not work.

6. Now, I come to some of the myths that we have created on higher education. Ignorance is a solvable thing but actually it is not, the more you know, the more ignorant you become. We think we can manage planet Earth, but we have to realize that we cannot manage it. We also think all that we have destroyed, we can replace with the help of science & technology. We need to take communities on board and we need to talk to each other across universities, peoples and societies. For example channel EPIC has a program RACHNA, which makes us understand the mathematics of the architectural creations. We can also reproduce the historical situations for example the great fire of London, see what happens which would be a great learning experience for everybody. Of course distance learning, open knowledge resources can all be used for collaboration and for building or understanding, so that the science and diplomacy can also happen. In atmosphere of mistrust, it cannot happen. There is so much of disparity, for example when we at the university do our entrance exam in eight countries, we have to do country wise exam, otherwise competition is not possible. We have a huge mistrust of each other because we are so involved in competitive defense technologies and because we use this data very often for scoring points and diplomatic points against each other.

7. There has to be dialogue among us ourselves, we need to start with little things like collaboration in educational institutions at all levels, wherever it is possible. We need to create people to people platforms in order for succeed. Even when Indo-US relationships were at very low and it is that scholars kept the dialogue open because they were have collaboration among universities. We have to open the dialogue on one hand with the policy makers and on the other hand with the communities because once the communities are involved.

Thank you very much.

Sh. A. B. Agrawal

Executive Director,
National Hydroelectric Power Corporation

Diplomatic Relationships and Hydropower Potential

1. All of our distinguished Panelists have spoken about Science & Technology and Diplomacy; I may add that science & technology existed since the "Rama Yug" and "Krishna Yug". It is not a new thing. The Kings and Queens married their sons and daughters with the neighboring countries King's daughters and sons to have diplomatic relationships. In the present era, we think dimensions have changed but things were existing before, though have not been documented. As suggested I shall speak on what type of diplomatic relationship we have in hydropower development in India. Before coming to the diplomatic relationship in the hydropower development, I would present the current scene in India.

2. We are having hydro potential of 1,48,000 MW+ and have developed only 42,703 MW, which is 28% of whole potential. This is rather pathetic situation. Despite so much technology and despite knowing the facts that all the developed countries have achieved their hydropower potential. Hydropower is not only meant for the power generation but also creates water reservoir. We have to plan for water and for flood protection as well. We were having 5,600 cubic metres per capita of water per annum, which has gone down to less than 1,100 cubic meters. As such we have only 4% fresh water of the world to cater 17% population. We know that despite all the technologies, we are wasting almost 70% water, whereas developed countries waste only 30% water. Shall we say, that we are knowingly ignorant of these. Moreover we are having only 90 days water reservoir and developed countries are having 2 or 3 years of water reservoir. China in 1990 was having similar state in development, as we were having in those days. Against the India's score of 42,703 MW in electricity capacity, China has reached at the level of 3.01 lac MW and going to become 4.2 lac MW country by 2020. Also the situation of water is going to be very grim in the next 10-20 years.

3. History is the testimony that civilization existed whatever water was there, not the power. Water storage in dams has been developing since the beginning. We have large evidence that researchers developed those in 1950s and 1960s and these helped us to survive so far. Coming to SAARC countries, these have total potential of 3.3 lac MW, but have developed only 15% of the total. Potential of Afghanistan is 25,000 MW, Bhutan 30,000 MW and Nepal 83,000 MW, but development is very less, of this Afghanistan generates only 600 MW, Pakistan out of 45,000 MW has 6,000 MW, Bhutan out of 30,000 MW has developed only 1,600 MW. We tried our diplomatic relationship with Nepal, Afghanistan and Bhutan, but so far India has been successful mainly in Bhutan.

4. In Bhutan we entered into diplomatic relationship and three earlier projects could be developed. Now we have tied up with Bhutan to develop 10,000 MW which will be purchased by India. Six projects will be developed by Intergovernmental Agreement and four by Joint Venture Route. A public sector undertaking of the Royal government of Bhutan shall be the joint venture partner of all the JV projects. As per that agreement 18% free power for next 18 years and at the end of 30 years the project will be surrendered to the Royal Government of Bhutan at no cost and in good working condition. Financing of this project is debt-equity ratio 70-30, the debt for the project shall be raised by the joint venture company. Entire design plans will be done by us. We are doing this to get some power and to have good relationship. For management, both JV partners shall have equal representation on the Board, nominating 3 to 5 members including one member from the Government of East countries. The Chairman of the Board shall be nominated by the Royal Government of Bhutan, but he will have no casting vote. Sale of powers; 70% of the energy under the long-term PPA and balanced through market mechanism, so market will decide in future that at what rate we can sell.

5. In earlier projects in Bhutan, 60% of capital was provided as grant and rest in the form of concession loan for 15 years at the simple interest rate of 5% not compounded. Similarly India helped Nepal also through many ways. A number of agreement and MoUs signed between both countries to strengthen diplomatic relationship with Nepal government.

6. My humble request to all of you that we have to develop all these in such a way that these are also beneficial to our country. We should have diplomatic relationship for the mutual benefit not for the benefit or to serve one particular goal. As diplomatic relationship is concerned, best example is Japan. When it was totally distructed in the 2nd world war, they had more than 1,56,000 MoUs and collaborations for development of Japan. We have to convey these things in such a fashion that some impacts are there in the society. Unfortunate part is that the majority of the discussions held are for the intellectuals and they are not percolating the general public, so that should be our goal. Thank You.

Sh. A.K. Jain

Ex-Commissioner (Planning),
Delhi Development Authority

Soft Cultural Diplomacy with Architectural Planning and Designing

1. Thank you Chairpersons for inviting me to this brainstorming on Science Diplomacy. I am an architect, and I will talk about soft cultural diplomacy. Architectural planning and designing are both science as well as arts. We have had a long tradition of cultural diplomacy. Over 2500 years ago, when Buddhism spread from India to all the South-East Asia's countries, it was a diplomacy which has gone through Korea, Japan, China and Cambodia and far off places. We are aware that this has created a very long lasting relationship. Buddhist monasteries were created in Tibet, China and Thailand. Nalanda University came up in India.

2. In last 300-400 years with India in colonial Raj, there has been construction of railways, canals, railway stations, educational buildings, guest houses, bungalows. Cities were built, starting from Bombay, Calcutta, Madras and New Delhi and some port towns like Surat and Cochin also came up. All these came up for the trading interest of the East India Company or British Empire. During this colonial period, almost 20 hill stations were developed in the century. In addition because military became very important 70 cantonments for the security and safety of the colonial government and 36 Palaces like Mysore, Jodhpur, Jaipur, Baroda and others were built by the Maharajas in the early 20th century. These became symbols of the colonial cultural diplomacy. An example is Gateway of India Mumbai in terms of architecture and built environment. We have all over India these kinds of monumental buildings, colleges, churches etc. The climax of this cultural diplomacy of colonial design was the construction of New Delhi and Parliament complex. These have created kind of soft and parallel goodwill between the two countries India and Britain.

3. After independence there was a new kind of diplomacy. In a zeal to build a new India, Jawaharlal Nehru, the enlightened Prime Minister of India invited 'Le Corbusier' through the French government to build a new capital of Punjab. Chandigarh is a symbol of diplomacy between France and India. The very recent example is the Supreme Court of Bhutan which was done by one of our architect friend Christopher Beninger. Prime Minister Sh. Narender Modi inaugurated it recently. This kind of example has also been repeated in Afghanistan, as the Kabul Parliament has been build by the Indian Architects with the help of Central Public Works Department and Ministry of External Affairs. In my opinion these kinds of projects can have a tremendous brand value and diplomatic value.

4. More recent science diplomacy examples include the Sustainable Development Goals (SDGs) and Paris Agreement on Climate Change. India has South Asian University which is a very good example, its President Dr. Kavita Sharma has recently highlighted the need for science diplomacy in education. I have been involved with its initial land allotment and the building committee of the South Asian University. We already have developed disaster and climate resilience. India has very extensively helped to mitigate the impact of earthquake in Nepal last year.

5. We have already various festivals in India, but these India's festivals need to be more tourist oriented, most focused and innovative in scientific or cultural aspects. These can help in creating a big market for India and a diplomatic goodwill. The visuals of soft diplomacy have much broader and deeper impact towards long lasting relationships. We have to think beyond diplomacy in terms of economic development, tourism, defense and have to focus more on the proxy measures of diplomatic relationships which are the social, human, design oriented and also have scientific temper. We have very specialized professionals cadre of town planners and architects, educationists and researchers. These can be India's brand ambassadors for building partnerships. The full time architects like Christopher Beninger may not be available to work as diplomat, but there can be a professional and organizational cadre of diplomats who can be given this kind of status. These can have very positive impact in terms of projects in India and also for mutual development between the South-Asian countries.

Thank you very much.

Sh. R. K. Sharma

Scientist 'E'
International Cooperation Division
Department of Science & Technology

Science Co0poration and International Agreements

1. Thank you very much for inviting me here to give my perspectives about science diplomacy. I admit that I am not expert in science diplomacy, but I am a practitioner of science diplomacy. I have been working as a scientist in International Corporation division of Department of Science and Technology since 1988. I will relate to how we are connected to science diplomacy. Presently, we have Intergovernmental agreements in S&T with around 80 countries and out of these 80 countries 50% of it was for 'science for diplomacy' and remaining 50% might be for 'diplomacy for science'. We are also partners in all these regional and multilateral organizations including EU, UN, IBSA, BRICS, SAARC, ASEAN, BIMSTEC etc. In 1988, we hardly had these international agreements with 2 or 3 countries and our budget allocation was around 10 lakhs annually. But today with 80 agreements on bilateral and multilaterals levels our budget allocation is around 300 crores per year. To connect with science diplomacy, International Corporation in science and technology, can virtually be called, if I can say so, the Science Diplomacy Division.

2. We have been practicing on this science corporation and science diplomacy since the DST was created in 1974. Now we are discussing science diplomacy, on a formal or policy level basis. We have categorized the science diplomacy as 'science for diplomacy' and 'diplomacy for science'. Presently, we have International Bilateral Corporation Section and International Multilateral Regional Corporation Division. Bilateral corporation in basically connected to 'science for diplomacy' and the multilateral regional groups which are basically political groups. I agree with Dr. Kavita Sharma's view point that our scientists are not serious in getting benefits of science diplomacy. In the SAARC context, DST is nodal department and is having a SAARC Technical Committee on Science & Technology. What we can offer to SAARC countries in terms of science and technology?

Last meeting of this committee was held in 2010 and since 2010, no meeting has taken place. This year's meeting we committed three months back and was planned on the 17th May this year, to be held in Delhi. Till date we have not received any confirmation from the MEA about participation in this meeting and we had to postpone and cancelled that meeting.

3. Our government is keen to push the work on science diplomacy. We should have the science diplomacy policy so, that we can benefit in both 'science for diplomacy' and 'diplomacy for science' for political as well as scientific gains. We are basically as a practitioner, would welcome suggestions for science diplomacy policy from this organization.

Thank you

Dr. Nafees Meah

Director, Research Councils UK (RCUK) India
British High Commission.

Collaboration between UK and India

1. The science collaboration between India and UK is quite intensive. Way back in 1996, Indian and British governments signed a treaty of high level on science innovation and collaboration. It is for almost ten years before anything significant actually happened. In 2008, a science & technology collaboration meeting was held and the Research Council office in India was set up. Since then, we have collaboration between India and UK on societal issues of water, energy, medical research and Public health research. We now have a very big jointly funded bilateral research programme in all these areas for about 200 million pounds.

2. Lot of questions may be there, how this happened? British government was very keen on issues around UK's commitment to global challenges. We came together India and UK did a better job to address to these challenges. After Mauritius, UK is biggest investor in India. We have also the very close economic relationship with India. Partnerships diversify in not only just universities but also industries, NGOs and other organizations. We want to develop that partnership in a different way.

3. The idea of working on SAARC platform would be interesting and attractive to us. If we could give momentum to it, Research Council of UK would be interested. I am not a diplomat but I have a diplomatic call because I work for the research council. There is a little bit difference between research partnership and government funding. For example when I was working with my colleague on foreign policy on Bangladesh energy section and we come to the conclusion that Bangladesh would not be energy sufficient country, that could not be physically possible. But energy sufficiency at regional level is perfectly possible. The argument is about a South Asian hub to address issues like energy under the SAARC science diplomacy and I am happy to be here in this meeting.

Thank you

CONCLUDING REMARKS

Shri Gautam Sen, Consultant Oil & Gas and Ex-ED, ONGC

Dr. Gautam Sen

Consultant Oil & Gas
Ex-Executive Director, ONGC

Concluding Remarks

1. It is a great afternoon and a very interesting brainstorming discussion on Science Diplomacy took place. Summarizing the deliberations he said that the Welcome Address was given by Dr. (Mrs.) Malti Goel who introduced the key issues and the need for Science Diplomacy in South Asia. In the Inaugural Address Prof. D. P. Agrawal made a very important point. He said that if we talk about SAARC, probably we can't take a big brotherly attitude. Prof. P. N. Desai delivered the Keynote lecture and said that in those days, when India had very bad relations with USA, yet the universities in US continued to attract bright students from India for higher studies. Today USA has come up because of the contribution of India and Indians, which is significant and we all acknowledge that and US too. Actually 90% of funding comes from developed countries and a part of the funding is from oil rich countries. But it is true that science & technology diplomacy among developed as well as developing countries can really bring up a much better world and we are heading towards it.

2. The Panel discussion was started by Dr. Kavita Sharma. She spoke on very important aspect of diplomacy in the education sector. She talked about team work, human resources and lots of areas about SAARC affirmations. Mr. A. K. Agrawal presented science & technology of diplomacy for the hydropower sector. The SAARC's hydropower achievement is only 15% which is very small and we have to develop diplomacy to increase its share. He talked about the issues concerning collaboration in hydropower with Bhutan. Mr. A. K. Jain talked about soft cultural diplomacy and he raised some very important points. Great Lord Buddha, who was born 2500 years ago, Buddhism became a great diplomacy itself. We can revive it. He also talked about colonial architecture, the kind of architecture that has comes up in India during colonial Raj. One important point is that this visual soft diplomacy has a broader impact towards long lasting relationship.

3. Mr. R. K. Sharma talked about science diplomacy and his role as a scientist in DST. We need to understand when he said that we need to keep that science part of it away from diplomacy, otherwise science becomes subjugate diplomacy. The UK government is trying hard to push the things said Dr. Nafees Meah who has vast experience and has been trying to built up a relationship between UK and India through science diplomacy. He talked about global challenges. India is 3rd largest investor in UK. He said that we have to work together and there is need for developing tri-lateral relationships and research partnerships. Interesting question that remains even after this enlightening discussion is that who is a person who is actually going to carry out science diplomacy, which is also needed to be addressed.

Thank you very much

Climate Change Research Institute

Brainstorming Discussion Meeting on Science Diplomacy

12th May, 2016

LIST OF PARTICIPANTS

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rans-disciplinary Research Cluster on Sustainability Studies

Climate Change Research Institute & TRCSS, JNU

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at Lecture Hall-II, IIC Annexe, New Delhi

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PROGRAMME

14:00 Hrs. Registration

14:30 Hrs. **INAUGURAL SESSION**

- Welcome by **Dr. (Mrs.) Malti Goel**, President, CCRI and Former Advisor, DST
- Inaugural Address by **Prof. D.P. Agrawal**, Former Chairman, UPSC and Chairman GC, CCRI
- Keynote Address &EEC lecture by **Prof. Pranav N. Desai,** Project Coordinator, TRCSS & Director, SASH&KN, JNU

15:15 Hrs. **PANEL DISCUSSION SESSION**

Chairman - **Prof. Pranav N. Desai,** JNU

Distinguished Panelists

- **Dr. Kavita Sharma**, President, South Asian University
- **Shri A.K. Jain**, Ex-Commissioner (Planning), DDA
- **Shri A.B. Agrawal**, Executive Director, NHPC
- **Shri R. K. Sharma**, Scientist 'E', DST
- **Dr. Nafees Meah,** Director RCUK India

- Floor Participation

16:45 Hrs. - Concluding Remarks by **Sh. Gautam Sen**, Ex-Executive Director, ONGC

17:00 Hrs. High Tea

Coordinators: ***Dr (Mrs) Malti Goel and Shri Gautam Sen***


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TRCSS
Dr. (Mrs.) Mukti Goel
Dr. O. P. Agrawal

Vision & Mission

To become a Centre for Excellence in developing human resources and technical capacity building in the area of climate change adaptation and mitigation

Organizers

Climate Change Research Institute is founded with a mission to promote environment education, innovation and teachings. It aims to address wide strata of society about the consequences of climate change on our lives and taking control measures. Institute is taking initiative to create awareness on energy security and sustainability through lectures in schools and college, workshops and internet reach. Its future work plan would include development of educational tools on topics of scientific and societal interest; such as energy, health and water in the climate change context. Research and studies would be undertaken on science & technology measures aimed at climate change mitigation and ways of reducing the emission of Co_2.

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