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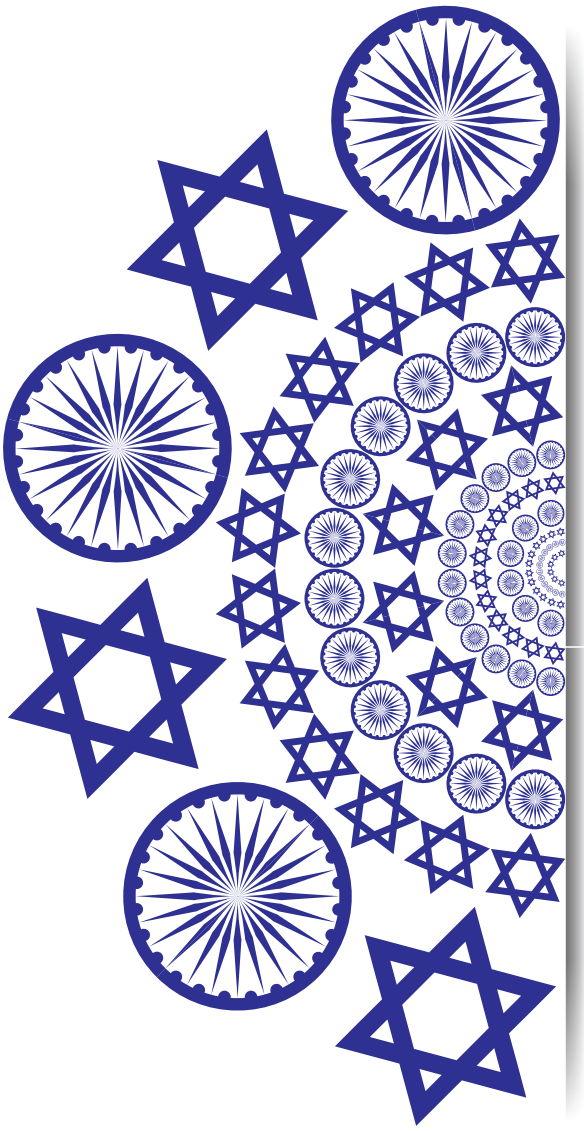
Pursuing the Unknown

CII
Confederation of Indian Industry



The 12th India Israel Forum

16–17 DECEMBER 2019
TEL AVIV, ISRAEL

— A Report —

1.

Executive Summary

The 12th annual meeting of the India-Israel Forum was held on 16th–17th December in Tel Aviv, Israel. The Forum reflected on past success, considered the contemporary challenges and discussed ways to jointly work together to deepen bilateral ties.

The Forum has continued to grow over the years, and this year new ground was covered by focusing on four key areas – Water security, cross border investments, Artificial Intelligence and Quantum opportunities in both countries. The latter three are emerging as areas of untapped potential between the two countries and the Forum recognizes the need to collaborate in these spheres to advance common objectives. The meeting represented both continuity and change. Participants included key stakeholders, academics and experts who have been here since the very beginning. Some new members this year brought a diverse perspective on the table.

Adding a new dimension to the forum, the first Youth India Israel Forum was held on 15th December 2019 in Tel Aviv. The Youth Forum emanated from the discussions from previous India-Israel Forum meetings, which stressed on having greater youth interaction. The Youth Forum explored innovative areas of collaboration between India and Israel and on ways to leverage them. An online forum has been set up to function as a platform for enterprises to increase awareness of opportunities, bridge cultural gaps and help Israeli companies to make first introductions to Indian companies.

A special meeting of the India-Israel Water Expert Seminar (with a particular focus on Basin and Aquifer management) was also held, focusing on the need for effective application of science, technologies, policies, and reforms for sustaining water and the lessons and experience of India and Israel. The meeting concluded that evidence-based advocacy is key going forward. A facilitation center can be formed for technologies and data analytics, housed within the CII-Triveni Water Institute.

Building on last year's expert seminar on semiconductors, Ambassador Ron Malka, Ambassador of Israel to India, and Ambassador Sanjeev Singla, Ambassador of India to Israel, officially released a report on the "Feasibility Study of a Semiconductor Fabrication Facility in India". The report assesses the feasibility of setting up a semiconductor fabrication facility in India and has been shared with both the Ambassadors and Professor K Vijay Raghavan, Principal Scientific Advisor, Government of India.

This year we also started the India- Israel Online Master Class series on Emerging Technologies. The aim of the Masterclass series is to promote academic linkages between India and Israel by enhancing technical knowledge and awareness about emerging technologies among college students in India. These Masterclasses are mainly targeted at students from various technical institutions in India. The Masterclasses are conducted by faculty members of Tel Aviv University who are leading experts in emerging

technologies, and understand contemporary trends and dynamics in the global technology front. The 3 sessions held so far have received tremendous feedback from the students and 4th class is scheduled in February.

As the Forum moves towards the 13th edition, its Bar Mitzvah, we will continue working towards increasing meaningful engagement between India and Israel in critical domains of business, economy, defense, and trade; jointly developing innovative solutions to remove current roadblocks and strengthen this indispensable partnership. We will also work on including specific themes and a diverse range of issues that are of mutual interest to both countries like e-mobility. Moving forward the venues for the forum meetings can be held outside the two capitals based on the main theme of that year. Both countries need to mobilize their resources, leverage each other's strengths and recognize each other's weaknesses to generate new areas of cooperation that reinforce confidence and mutual trust between them.

2.

Key Takeaways

Session 1:
Report Back Session

a. Report back on Water Expert Group

Water is increasingly becoming a critical resource, given the rising variability in its availability. The global water market is estimated to be USD 900 billion. India does not face water shortage, but largely the issue is of water resource management. While India has an immense capacity for advancing science & technology in this area, the challenges remain on incentivizing the low-income population to use water efficiently.

Hydrological boundaries superimposed on political boundaries can put the right perspective in place for basin and aquifer management.

Mapping of both hydrological basins and aquifers becomes an important aspect of putting the technologies to use. Technologies herein include both demand and supply-side interventions, including new and additional water sources such as Desal, Municipal sewage treatment, and reuse.

Smart solutions, data analytics, AI, innovative technologies, etc. are going to emerge as huge investment areas in the times to come. India and Israel could collaborate here to ensure water for all. Data is another key area that requires intervention, and collaboration in data analytics is another viable option.

Water innovation is important but equally important is affordable technology. However, technology without incentive and vice versa may not work.

Fixing water tariffs lies at the root of the water problems being faced. More importantly, building consumer confidence and awareness of paying for assured and good water could lead to transformation in the overall perception here. Incentivizing water conservation and management technologies through subsidy restructuring could help in the adoption of the right technologies.

Evidence-based advocacy is the key to going forward. As the next step, a subgroup could be formed to deliberate specific topics. A facilitation centre, housed within the CII Water Institute, could also be formed for technologies and data analytics.

b. Report Back on Semi-conductor Working Group

In the 2018 meeting of the India Israel Forum, an expert group meeting of semiconductors was organized. As a follow up to it, a core group, consisting of members from both India and Israel, was formed to evaluate the feasibility of setting up a semi-conductor fabrication facility in India.

Ambassador Ron Malka, Ambassador of Israel to India, and Ambassador Sanjeev Singla, Ambassador of India to Israel, officially released the report of this group, titled “Feasibility Study of a Semiconductor Fabrication Facility in India”. The report has been shared with both the Ambassadors and Professor K Vijay Raghavan, Principal Scientific Advisor, Government of India. Key findings & recommendations:

The report projected that India’s total semiconductor consumption in 2025 may be US$ 40 - 50 Bn. If this consumption continues to be fulfilled through

imports, chips can soon become an extremely large import item for India. Additionally, establishing a domestic fab industry may also be of strategic benefit as it builds the nation's capabilities in an important technology of the future.

A domestic fabrication industry could also support the Government's objective of developing an IoT ecosystem in India, under the vision of Digital India. A local semiconductor manufacturing industry may support the development and manufacturing of sensors, especially in the domains of agriculture, healthcare, smart cities, safety and waste management, required for India specific IoT products envisaged in MeitY's draft 2016 policy on IoT.

While establishing the industry requires significant government support, over a longer-term it is likely to pay back with a multiplying economic impact and development of a high-tech ecosystem in the country.

An analogue and mixed-signal foundry at a technology node of 45/65 nm, could be a starting point for India to develop a semiconductor fabrication industry. Israel as a technology partner could transfer the initial technology, provide support to set-up the fab and support early market development.

The Forum assesses the proposed fab may offset semiconductor imports of US$ 8 billion over the projection period and may have a further multiplier impact of US$ 15 billion on the Indian economy.

Monetary and non-monetary support will be needed from the Government of India, to attract investment in the proposed India fab. As per the financial model in the report, a cash subsidy of US$ 912 Mn on capex and an interest-free loan of US$ 1,089 Mn, could help achieve 15% equity IRR, the likely threshold for corporate investors. The government should also provide all necessary support in terms of connectivity, infrastructure, preferential market access, etc.

Need to have a steady financial private partner to set up a Fab. The private partner could have equity to ensure that there is a responsible stakeholder.

The recommendations from the report on "Feasibility Study of a Semiconductor Fabrication Facility in India" needs to be taken up at the next level and a consortium could be built around it. India can work with Israel to create a roadmap towards its implementation.

c. Report Back on Youth Forum

The first Youth India Israel Forum was held on 15th December in Tel Aviv, Israel. The participants were from diverse sectors from both India and Israel and stressed on the importance of finding ways to complement the strengths of Israel (demography and government incentive & support) with the opportunities in India (human resources, market exposure, etc.)

The three focus areas:

- **Bridge the Cultural Gap**

  — As two knowledge-based economies, collaborations between academic institutions need to be enhanced, particularly in the field of life sciences. Jointly working in the spheres of quantum science and data & artificial intelligence would be mutually beneficial.

— There is a very high level of curiosity & enthusiasm from both the Indian and Israeli sides. This enthusiasm should be leveraged to promote social responsibility programmes and have Israeli professors & students visit India to understand the society & culture, gain knowledge and learn from their experiences.

— It was proposed that an Israeli delegation be invited to India in summer 2020 as a step towards increasing soft engagement

- **Make India and Israel the First go-to Partner for Each Other**

— India can be the first source for talent

— Israel can be the first source for technology

— Need to put in place mechanisms that ensure continuity

- **Continuing Strengthening the Relationship**

— Need to share more success stories to create public exposure and enhance trust between the Indian business owners and Israeli start-ups.

— Encourage high-level collaborations in the areas of environmental sustainability, healthcare, joint value creation at all levels - G2G and B2B

An online forum has been set up to function as a platform for enterprises to increase awareness of opportunities, bridge cultural gaps and help Israeli companies make first introductions with Indian companies.

The Youth Forum should be continued to successfully engage with the youth delegations of both countries. Recommend that the Youth Forum next year have more publicity and visibility with the community and the government.

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SESSION 2:
The New Regional and Global Disorder: Implications for India and Israel Partnership

There is consistent instability in Israel as it heads towards its third election within a year.

The crisis of Arabs- the Arab states are going through a period of political weakening and instability. Political freedom, first-world education system, and gender equality are the three main deficits that Arab countries are reeling under, creating poorly performing and stagnating economies. Other major problems include water, importing food and forced population displacements. There is a need to create a balance between population and resources to avoid a deepening crisis.

In the atmosphere of crisis, there has been a dramatic rise in the regional importance of non- Arab of Iran, Israel and Turkey.

Russia has emerged as a key player in the region, filling the vacuum left by the US. But, the crisis of the Arab states cannot be remedied by external powers.

Regional politics have shifted, particularly against Iran. Iran is reeling under the US imposed sanctions and

domestic unrest. Though Saudi Arabia has softened its approach towards Iran, riots in Lebanon and Iraq have turned into anti-Iranian protests. Israel still has differing perspectives on Iran.

Iran's nuclear capabilities are a point of concern for both India and Israel.

If the current scenario prevails without any long-term solutions, the region will face prolonged instability.

India is at an advantageous position in the current global order. There is instability in the Middle East, America is moving towards isolationism, China is re-focusing on the US, EU & UK are grappling with the consequences of Brexit and Pakistan's economy is on a rapid decline.

Prime Minister Modi returned to power with the enormous political mandate and carried out major policy changes. There is a huge focus on indigenization of the defence industry, integration of the defence command by appointing a Chief of Defence Staff and a drastic shift in the Kashmir policy– it has received global support and even China has remained neutral.

India's foreign policy has progressed as India develops new relationships and revives old ones. The relationship with Russia has moved away from defence and towards securing India's energy needs. The Gulf countries are beginning to recognize India as a key strategic player in the region in the future. Relationship with Saudi Arabia is being strengthened by emphasizing on finance and investments. In Asia, the status quo with China is being maintained while Japan remains India's essential partner in Asia.

The future strategic problems for India will be in the Indian Ocean. There are already many proxy wars in the region. We need to be prepared to mitigate this threat. Under this backdrop, India will need to concentrate its efforts on building stronger ties with Indonesia, Australia, and France as these countries are emerging as influential players in the Indo-Pacific and will find a central place in India's foreign policy for the region in the coming years.

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SESSION 3:
Cross Border Investments: Opportunities and Challenges

Cross border investments continue to remain a major way of economic engagement between India and Israel. On the micro-level, bilateral merchandise trade between India and Israel was US$ 5.84 billion (excluding defence) in 2018, with the balance of trade being in India's favour by US$ 1.8 billion.

Both economies have complimentary national economic interests. Israel is a technology-driven & innovation-based country with a small domestic market. There is great potential for investments and technology transfer. India has a huge market and an abundance of skilled and unskilled labour. A national priority for India is to develop infrastructure to propel its growth.

Presently the focus sectors for investment between the two economies are agriculture, aerospace, mobility, defense, medical devices, and cybersecurity. Sectors with unique advantages in Israel i.e. Agriculture, Cyber Security, Food Processing, Aerospace & Defence, Medical Devices & Auto Tech have a strong need in India in terms of technology & market potential.

There is a need to carefully understand the sectors Israeli

companies want to invest in and provide incentives & guidance. Foreign education & travel, pharmaceuticals and building corporate debt market are some areas of opportunities for Israel to invest in India.

Israel can also benefit from India's abundance of top technical talent. A student exchange programme is also a great way to acquire talent from India. Need to ease the visa regulations to encourage students to work in Israel and ease the movement of technical professionals from India.

Structural issues in India's investment portfolio are a major concern along with India's dependence on the domestic market instead of the international market.

As India's economy develops, it becomes more active in the cross-border investment market. But India's GDP is growing faster than its involvement in the cross-border market investment. Out of Israel's FDI stock, only a small share originates from India and the inward investment in India is led by Singapore.

India has been unable to use the US-China trade war to attract finance and investments. Despite the Indian government's investment in infrastructure and efforts to streamline activities, provide an incentive to entrepreneurs and improve ease of doing business. India needs to relook at both at physical infrastructure and social infrastructure (ease of business, permits & clearances, etc.)

Establishing a strong economic relationship with India is essential for Israel. Need to increase the flow of investments between the countries but there are two roadblocks –taxation uncertainty and regulatory uncertainty.

A tax convention and bilateral investment treaty will decrease uncertainty and remove barriers for foreign investors and investments.

We need to negotiate a new and modern bilateral investment treaty rapidly and support mutual investments. The treaty must ensure non-discrimination between foreign and local investors, free & equitable treatment, and free transfers of capital, prohibition of expropriation or nationalization and access to international investment arbitration for enforcement.

Need to increase cooperation between financial market regulators to establish a framework for dual-listing companies. From the Indian investor perspective, Israeli start-ups have an outlook of short-term growth and exit. Israel has presented itself as a start-up nation rather than a long-term investment nation. Need to stop looking at Israel as a start-up nation but rather as a scale-up country.

The major barrier to bilateral investment flows that Israel's faces are enforcing contracts, investors protections and disincentives to invest. Have to address these issues and work towards making markets more transparent, predictable and with a high margin focus.

It is critical to create avenues of mutual trust and commitment to help Israeli companies navigate the Indian markets and expand cross border investments. Focus on education in governance will be helpful in this regard.

Could compile a document of barriers and issues faced by foreign investors and present it to the government.

SESSION 4:
National Security and AI

The applications of Artificial Intelligence are almost infinite, particularly in the area of defence. There is a need to look into the big systems and incorporating AI in these projects. It is also necessary to educate the industry on the basics of AI and its impact on various sectors. Different combinations of public-private-academic partnerships could also be explored.

AI is a dual-purpose technology that can be developed for defence systems as well as for civilian use. Israel is a global leader in artificial intelligence and has become a hub of a vibrant AI ecosystem. Israel's approach to AI is very robust product-oriented while India's approach is more service-oriented.

On the defence side, a multi-stakeholder task force on Strategic Implementation of Artificial Intelligence for National Security and Defence was constituted by the Ministry of Defence, Government of India. In the private sector, there are limited start-ups in the AI and are still ad-hoc and fragmented. A key challenge is how to share personal data with start-ups.

It is important to have a clear understanding of the objectives that India seeks to accomplish and the kind of model it needs to adopt to develop AI technology for defence systems. Within the Indian ecosystem, the American model of a bidding system will work rather than an Israeli model of defence companies working closely with the government.

The Indian government's AI initiatives in defense and aerospace have had mixed results. ISRO has done path-breaking work by developing an AI-powered Pragyan rover for its Chandrayaan 2 mission. Meanwhile, DRDO has done little work by restricting itself to a data-based approach to AI. The commercial and the hi-tech sector are leading the technology in AI and the defence sector has very limited work in this area. The commercial and hi-tech companies are not very enthusiastic about jointly working with purely defence companies. We will have to promote more success stories to move past this barrier.

A three-line framework encompassing education research, engineers, and end-use can be developed for specific domains. While commercial and hi-tech companies would take the lead on purely technical and software related issues; a collaboration between government and hi-tech companies would deal with defense-related projects.

AI presents immense opportunities and both countries should enhance cooperation in the field of defence weapon systems. Both countries need to invest in applied research that can be employed in defence projects like facial recognition systems that could be mutually beneficial.

The collaboration between India and Israel should be between the full ecosystem i.e. academia, start-ups, etc. and not just be limited to the defence community. We should be working towards a solution-driven collaboration.

The need for AI in defence and other services will only increase over the years, we must prepare the ground for it now. There is enormous potential to cooperate in AI in areas like healthcare, agriculture and transportation. Integration of AI requires a skilled professional, capital and innovation. An academic, industry and government synergy will be a good start to realize our AI in defense.

The manpower in the AI sector still seems to be limited. India will require at least 400,000 PhDs in AI in the future. Academia can lead the way in this. Need to

have strong people to people exchanges and build strong networks between academic institutions. A group of five post-doctoral candidates from India could study in Israel and gain knowledge in AI which they can then apply to their country. Moreover, we could also have post-doctoral scholarships particularly in the field of AI.

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SESSION 5:
The Next Big Leap: The Quantum Opportunity for India and Israel

Quantum computing is not a small incremental change but a big leap. The world is at the brink of the second quantum revolution with quantum technology paving the way for smaller, faster, powerful and more flexible electronics and devices than ever before. Many of the world's largest economies, including the US, China, Europe, Russia, Australia, Israel are already in the league of quantum supremacy and are investing heavily in quantum computing capabilities.

Companies like Google, IBM and Microsoft are developing quantum technologies. We need to create ties with these corporations to train a new generation of programmers who can take their knowledge and expertise back to their country.

In India, the Department of Science & Technology's Mission-Mode scheme, called "Quantum Science and Technology" or QuST, will fund research for the development and demonstration of quantum computers, quantum communication, and cryptography, besides demonstration of quantum teleportation in Phase 1. After three years, the Defence Research and Development Organisation (DRDO), the Indian Space Research Organisation (ISRO), and the Department of Atomic Energy (DAE) are expected to jointly fund Phase 2.

The initiative of the Department of Science & Technology has received an overwhelming response and has already received more than 120 proposals from researchers from different parts of the country. ISRO, in collaboration with Raman Research Institute, has initiated a mega project called "Quantum Experiments Using Satellite Technology (QUEST).

In spite of the above initiatives, there are several hurdles to address before many of these technologies become a reality in India. Some of these are:

- Lack of talent in the Indian quantum computing industry
- Very few institutes in India teaching quantum technology
- Quantum R&D in India is yet to catch up, especially for Indian industry

Other challenges in the quantum domain are:

- Bringing in experts from multiple disciplines (physics, engineering, computer science, etc.) because quantum is not specific to one domain.
- Lack of a roadmap on how quantum computing can be harnessed and the business model to adopt for it.
- Quantum will transform businesses and they need to be educated on the opportunities it will present.

- Need a better understanding of whether to invest in hardware or software

Risk sharing is one of the main issues. It is necessary to create a framework of risk participation between the private and public sector. Adopting joint ventures can be a way of working together to deepen trust.

Talking about quantum without the capability of a semiconductor manufacturing has no meaning. Setting up a domestic semiconductor facility in India should be the first step to realize the full potential of quantum. Israel has a strong semi-conductor base and India can take into account its model while developing its semiconductor industry.

Encourage partnerships between start-ups, researchers and technology providers to translate quantum research into capabilities suited to the business world. We can start by organizing small workshops and student exchange programmes between Israeli and Indian universities.

TAU is keen on having direct collaborations with Indian universities and the Indian industry in the area of quantum science and technology. Can have more postdoctoral students from India to TAU for research. These students could be supported through scholarships or sponsored research or any other ways.

Beyond collaborations between universities and research institutes of both countries, collaboration at the government level is necessary, specifically on funding. Developing an academic-industry partnership to help prepare businesses and students for the next era of computing would be beneficial for both countries.

There is a shortage of a technical pool in this field. The key is to train human resources, enhance academic collaborative effort and encourage knowledge transfer between the two countries. Creating a strong fundamental quantum ecosystem between India and Israel to accelerate opportunities would be mutually beneficial.

Training in software development and building a supercomputer are two huge areas of opportunities for India and Israel. Quantum sensors are also a low hanging fruit where India-Israel can collaborate. Likewise, setting up centres for Quantum Information, cryptography & computing would provide an opportunity for stakeholders in both countries to develop the field.

Both countries should also create an actionable roadmap on capacity building and collaborative R&D in the areas of quantum research that will help them steer ahead in the quantum computing race.

3.

List of Participants

Israel Delegation

1. **Aharon Fogel (Co-chair)**
   Chairman
   ZIM Integrated Shipping Services Ltd

2. **Stanley M. Bergman (Co-chair)**
   CEO and Chairman, *Henry Schein*

3. **Professor Shmuel Avidan**
   School of Electrical Engineering
   Tel-Aviv University

4. **Adiv Baruch**
   Chairman
   Israel Export & International Cooperation Institute

5. **Isaac Ben-Israel**
   Chairman, *Israel Space Agency*

6. **Ram Fishman**
   Founder, NITSAN, Sustainable Development Lab
   Tel Aviv University

7. **Shira Greenberg-Gelbwaser**
   Chief Economist
   Director of State Revenue, Research and International Affairs

8. **Israel Makov**
   Chairman, *SUN Pharmaceuticals*

9. **Ron Malka**
   Ambassador of Israel to India

10. **Yaron Oz**
    Rector, *Tel Aviv University*

11. **Professor Ariel Porat**
    President, *Tel Aviv University*

12. **Ophir Shoham**
    General Partner, *Axon Ventures*

13. **Eden Shochat**
    Equal Partner, *Aleph*

14. **Asher Susser**
    Senior Fellow, Moshe Dayan Center for Middle Eastern Studies
    Tel Aviv University

15. **Guy Swersky**
    Managing Partner, *Excalibur Capital*

16. **Eli Tidhar**
    Partner and Industry Leader
    Deloitte Consulting, Israel

17. **Giora Yaron**
    Chairman, *Itamar Medical*

OBSERVER

1. **Gary Sussman**
   TAU Forum Coordinator

Indian Delegation

1. **Jamshyd Godrej (Co-chair)**
   Chairman of the Board
   Godrej and Boyce Manufacturing Company Ltd

2. **Nikhil Sawhney (Co-chair)**
   Managing Director
   Triveni Turbine Limited and Director
   Triveni Engineering and Industries Limited

3. **Jaideep Ahuja**
   Yi Mission Co-Chair and Managing Director & CEO
   Ahuja Residency Pvt. Ltd

4. **Anjan Das**
   Executive Director, *CII*

5. **Pramit Pal Chaudhuri**
   Foreign Editor, Hindustan Times and
   Distinguished Fellow & Head Strategic Affairs
   Ananta Aspen Centre

6. **KRS Jamwal**
   Executive Director
   Tata Industries

7. **Dr Kaushik Murali**
   President Medical Administration, Quality &
   Education, Sankara Eye Foundation India &
   National Chair Entrepreneurship
   CII – Young Indians

8. **Kiran Pasricha**
   CEO, *Ananta Aspen Centre*

9. **Prem Pungaliya**
   Senior Consulting Advisor
   Jetsynthesys Inc

10. **Ravi Singh**
    Secretary General and CEO
    World Wildlife Fund – India

11. **Raghavendra Singh**
    Senior EVP and Group Head - Public Affairs &
    Government Business
    Kotak Mahindra

12. **Sanjeev Singla**
    Ambassador of India to Israel

13. **Vaishak Swamy**
    CEO, *Kotak Mahindra, UK*

14. **Kapil Narula**
    Executive Director
    CII – Triveni Water Institute (Centre of
    Excellence on Water)

15. **Harihara Natarajan**
    Distinguished Member of Technical Staff &
    Chief Architect, *Wipro*

16. **Dr Vidya Praveen Bhallamudi**
    Assistant Professor
    Department of Physics, *IIT-Madras*

OBSERVER

1. **Harshit Sehgal**
   Senior Director, *Ananta Aspen Centre*

2. **Pranya Jain**
   Programme Executive, *Ananta Aspen Centre*


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