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India and Israel: Cooperation on Water Management

India is seeking Israel's expertise in water technology and management techniques. Cooperation between the two countries will enhance India's capacity in the management of water resources but this needs to be supported by water demand management, training of users for the operation and maintenance of technology, and robust legal and regulatory frameworks.

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Introduction

In July 2017, Indian Prime Minister Narendra Modi visited Israel. This was the first visit of an Indian prime minister to Israel, marking 25 years of diplomatic relations. The visit elevated bilateral relations to a 'strategic partnership' between the two countries.

The two are already significant allies, with trade touching US\$4.16 billion (S\$5.68 billion) in 2016 (excluding defence expenditures).² This visit broadened partnership into other key areas, with Modi meeting and encouraging the chief executive officers of Israeli companies to invest

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² "India-Israel Economic And Commercial Relations." *Indembassy.Co.IL*, 2017, <https://www.indembassy.co.il/pages.php?id=14Some#.WXBysISGOUk>.

in India. With a Gross Domestic Product (GDP) of US\$2 trillion (\$2.73 trillion), India is a huge market for Israeli companies wishing to tap into the world's second largest population.

Detailed talks between Modi and his Israeli counterpart Benjamin Netanyahu led to the signing of seven agreements, with three in the agricultural and water sectors as follows:³

- 1) The Ministry of Drinking Water and Sanitation of India and Israel's Ministry of National Infrastructure, Energy and Water Resources signed a pact on National Campaign for Water Conservation in India;
- 2) The Uttar Pradesh (UP) government and the Israel Ministry of National Infrastructure, Energy and Water Resources signed a pact on state water utility reform in India.
- 3) India and Israel agreed on a three-year programme in agriculture cooperation from 2018 to 2020.

Water Management Challenges

India is looking to harness Israel's expertise in technological innovation and water management. However, it faces a number of challenges in the management of its water resources, with four key issues identified as follow:

- 1) Population: Currently, India has a population of 1.31 billion people, making it the second most populous country in the world behind China. By 2030, the population is estimated to reach 1.5 billion, with a 50 per cent gap between water demand and supply.
- 2) Agriculture: Even though agriculture's contribution to India's GDP has decreased and now stands at approximately 15 per cent, close to 600 million people are still dependent on it for their living. This makes the availability of water for agriculture crucial, not just

³ "Narendra Modi Israel Visit: India And Israel Ink 7 Deals", Financial Express, 2017, <http://www.financialexpress.com/india-news/narendra-modi-israel-visit-7-agreements-signed-between-india-and-israel-jointstatement-pm-netanyahu-says-you-and-i-will-change-the-world/750484/>.

for 54 per cent of the working population engaged in farms as cultivators and labourers, but also for food production and the country's economy.

- 3) **Water Resources:** India depends on two key sources of water supply – ground water and rivers. Both are under stress due to rapid industrialisation, urbanisation and climate change. Groundwater is used by households and agricultural producers. However, unsustainable extraction, due to variable water delivery (and free electricity to farms), has resulted in declining water tables. In some parts of India, the water table is falling by more than a meter per year.⁴ But the demand for water is increasing. Today, the country uses more groundwater than both China and the United States combined.⁵

At the same time, rivers are shrinking due to bio and chemical waste discharge. For instance, the Ganga River flows through 11 Indian states and provides water to more than 500 million people. However, it has become unusable in the states of UP and Bihar due to industrial and sewage waste. The Yamuna River is in the same condition as it receives approximately 850 million gallons daily of sewage from New Delhi, making it hazardous for local populations.⁶ An estimated 21 per cent of the country's diseases are water related.⁷

- 4) **Infrastructure:** Water supply and sanitation infrastructure are compromised in most parts of India. For instance, New Delhi faces approximately 40 per cent system losses in water supplied to the city.⁸ Although improvements have been made in increasing the availability of water, significantly more investments are needed to cater to approximately 76 million people who have no access to safe water.⁹ Investments also require maintenance. Estimates suggest that approximately US\$500 billion (S\$680.6 billion) worth of water and irrigation infrastructure is performing poorly and neglected.¹⁰ The

⁴ Shiao, Tien et al. "3 Maps Explain India's Growing Water Risks." *Wri.Org*, 2017, <http://www.wri.org/blog/2015/02/3-maps-explain-india%E2%80%99s-growing-water-risks>.

⁵ "Why India Has A Water Crisis?." *The Economist*, 2016, <https://www.economist.com/blogs/economist-explains/2016/05/economist-explains-11>.

⁶ Chaudhary, Juhi. "Thirsty And Ill In Delhi." *The Third Pole*, 2015, <https://www.thethirdpole.net/2015/10/10/thirsty-and-ill-in-delhi/>.

⁷ "India's Water And Sanitation Crisis." *Water.Org*, 2017, <https://water.org/our-impact/india/>.

⁸ "New Delhi Faces An Acute Water Shortage." *The Wire*, 2017, <https://thewire.in/156626/new-delhi-water-shortage/>.

⁹ "India's Water And Sanitation Crisis." *Water.Org*, 2017, <https://water.org/our-impact/india/>.

¹⁰ *Water Sector In India*. World Bank, 2011, <http://www.worldbank.org/en/news/feature/2011/09/29/india-water>.

resulting water and productivity losses, along with the spread of diseases, constitute a major burden on the country's finances.

Existing Linkages

Within the last decade, Israel has moved from a country with chronic water shortages due to climate change and persistent drought to a water-rich country.¹¹ Today, it has more water than it needs. While drought and food shortages in neighbouring Syria led to civil war, Israel became the world's most advanced country in water technology and management techniques. Its two-pronged strategy included a reduction in demand and an expansion of supply sources through desalination and waste water recycling. Now countries across the world, including China, Japan, Canada and Ghana, draw on its expertise to solve their own water challenges.

India too has been drawn to Israel's prowess in the agricultural and water spaces. Since 2008, Indo-Israeli Agricultural Cooperation Project has been underway between Mashav and the National Horticulture Mission in India.¹² Under this project, Agricultural Centres of Excellence were set up, providing a platform for the sharing of information, best practices and technologies for farmers. With 30 centres in different states of India, evidence suggests a positive impact on the income levels of the farmers. For instance, the Gharaunda Centre of Excellence in the state of Haryana introduced the farmers to new cultivation methods and advanced fertilisation and irrigation techniques. Approximately 20,000 farmers visit the centre each year. It was noted that Israeli technology and training helped increase crop yields between 5 to 10 times and produced a 65 per cent reduction in water use in the first three years of operation.¹³

Water technology companies from Israel have been gaining a foothold in the Indian market for a number of years. Chennai, for instance, depends on rainfall to fill the four lakes around the city, which then feed its seven million residents. Unpredictable rainfall disrupts the city's water

¹¹ Federbush, Marjorie S, and Jerome C Muys. "Israel And Water – (What's Next For The) "Turn Around Nation": How Israel's Leadership In Advanced Water Technologies Can Enhance Global Economic Growth And Diplomatic Relations." *American Foreign Policy Interests*, vol 34, no. 6, 2012, pp 309-321. doi:10.1080/10803920.2012.742408.

¹² Mashav is Israel's Agency for International Development Cooperation (Ministry of Foreign Affairs).

¹³ *The Indo-Israeli Agriculture Project*. MASHAV, 2017, p 8, http://mfa.gov.il/MFA/mashav/Publications/Subject_Publications/Documents/Indo-Israeli%20Agricultural%20Project.pdf.

supply almost every year. To mitigate this problem, the Chennai Metropolitan Water Supply and Sewerage Board set up the Nemmeli Desalination Plant in 2013. It was built by VA Tech Wabag, in collaboration with Israeli company IDE Technologies, on a design, build and operate basis. With a capacity of 100,000 cubic metres, this plant converts sea water into potable water for over one million people in the suburbs of Chennai. While it has not completely resolved the city's water woes, it has expanded the supply base and opened up opportunities for new collaborations.

The city of Agra relies on the Yamuna River to serve water to its residents, but pollution and a contamination of the river water had produced a severe water crisis in the city. Consequently, in 2012, an Israeli company Aqwise was tasked with purifying drinking water. Through the help of a local implementation partner, it now uses the Moving Bed Biological Reactor technology to clean 150,000 cubic metres of water daily for over two million residents and visitors in Agra.¹⁴ The largest project of its kind in the world, this technology is simple, inexpensive and scalable to other parts of the country.

New Era of Water Cooperation

Given existing linkages, the recent visit of Modi to Israel will enhance the nature and scale of water cooperation between the two countries.

A growing population, industrialisation and climate change challenge India's ability to manage its water resources. The expected shortfall in supply will reach 50 per cent by 2030. Therefore, desalination and waste water recycling hold immense potential as additional sources of supply. Israel has used both to tackle its own water shortages. While desalination plants have been set up in some cities of India, there is potential to further utilise this technology. Israeli companies today have advanced desalination technology that require less maintenance and energy. One such technology was witnessed by Modi during his visit to Israel.¹⁵ GalMobile is a portable

¹⁴ MBBR technology sets loose thousands of little biofilm carriers in the water body. Water passes through these balls and the bacteria is contained inside them.

¹⁵ "What Is Galmobile", *Financial Express*, 2017. <http://www.financialexpress.com/industry/technology/what-is-galmobile-how-israeli-technology-netanyahus-fascinating-jeep-can-solve-water-woes-in-modis-india/753243/>.

seawater purification plant designed to produce high quality drinking water. The first of its kind in the world, it can purify 20 cubic metres of sea water per day and 80 cubic metres of brackish, muddy or contaminated river water. Its size and mobility increase its desirability and potential to tackle the fundamental problem facing the water sector in India – dirty and polluted water. There are additional benefits. These mobile vehicles can serve remote communities and villages, unconnected to main water supply networks. It needs two people to operate, and if provided on a franchisee basis, it can encourage entrepreneurship and employment opportunities.

WaterGen, an Israeli company specialising in air-to-water technology, has also entered the market. It recently signed a US\$100 million (S\$136.5 million) deal with a local solar engineering firm and will serve remote villages in India. Its solar-powered system will produce fresh water from air and will be available in small (home), medium and industrial scale. Not only will this benefit communities which lack access to water, but it will also reduce dependency on rain and ground water. The risk of disease and time spent traveling long distances to collect water will also be decreased. In addition, the system will reduce reliance on electricity, reducing energy costs for households trying to access groundwater. As with GalMobile, a franchisee network and partnership with a local firm will double the benefits to the local population by creating income generating opportunities.

Apart from quality and access, wastage of water is a critical issue. To that effect, the pact between the two countries for a National Campaign for Water Conservation in India is vital. It aims to raise awareness about water among citizens and encourage them to save it. While the details of the conservation campaign in India are not available as yet, its primary focus must be the users in the agricultural sector, since over 80 per cent of India's water is consumed by irrigation.¹⁶ Water wastage occurs due to traditional irrigation methods which flood the field. This campaign combined with the agricultural development programme from 2018 to 2020, is a tremendous opportunity for India to enhance the skills and capabilities of farmers in water conservation. Israel, with its own arid to semi-arid climate, has suffered from drought conditions. As such, its lessons in agriculture are applicable to India. In the past, many companies developed drip irrigation systems but they produced little success for the farmers

¹⁶ Singh, Prabhat. "6 Charts That Explain India's Water Crisis", *Live Mint*, 2015, <http://www.livemint.com/Opinion/97fuaF2aQkO9IjPiPAjMyL/Six-charts-that-explain-Indias-water-crisis.html>.

who need training on the usage and maintenance of the systems. The Centres of Excellence are filling this fundamental gap. The technology is demonstrated in the centres and specialists then work with the farmers on ground (fields) to see if the technology is being correctly used and maintained. This hand-holding is essential for farmers who often have little formal education and are unable to apply the new technology.

Challenges Ahead

India needs a mix of demand and supply management techniques, combined with technological innovations, to meet the water needs of households, industry and agricultural producers. The strategic cooperation with Israel will focus on expansion of water sources, that is, desalination and wastewater recycling. India itself is also concentrating on increasing storage capacity. It has the third largest number of dams in the world.¹⁷ However, there needs to be an equivalent focus on demand management. A decade ago, Israel began its turnaround through demand reduction by highlighting the country's water challenges in aggressive campaigns and imposed high tariffs on domestic users of fresh water – the average Israeli families. The joint effect of tariffs and public campaigns decreased water consumption successfully by instilling consciousness among the citizens.¹⁸ In India too, the pricing of water needs to be adjusted to reflect the economic value of water. This will come through higher tariffs and the installation of meters for households, so water usage and leakages can be accounted for. For the farmers, ground water dependence has increased as fresh water availability is highly variable. Therefore, subsidies for tube well usage will need to be cut to curtail the unsustainable levels of groundwater extraction. Cutting subsidies will be politically difficult and it will depend on the central and state governments' commitment to addressing the core issues plaguing the water sector.

The Israeli water technology will need linkages with local businesses and people in India. While most Israeli companies have entered the Indian market through local partners, there is a growing need for skills upgrading so that the users can be trained to understand the technology, its operations and maintenance. Otherwise, infrastructure and technology investments will go to waste. Linkages are also importance as they foster innovation – local businesses can learn

¹⁷ Singh, Prabhat. "6 Charts That Explain India's Water Crisis." *Live Mint*, 2015, <http://www.livemint.com/Opinion/97fuaF2aQkO9IjPiPAjMyL/Six-charts-that-explain-Indias-water-crisis.html>.

¹⁸ Federbush, Marjorie S, and Jerome C Muys, op cit.

and adapt the technology to other problems. In order to develop these connections, state governments in India will need to ease restrictions to market entry and provide incentives for businesses to employ and train people.

Robust legal and regulatory frameworks are also needed to protect natural resources and the environment. For instance, Water ATMs (automated water dispensing units) were introduced in India a few years ago to service communities which lacked access to quality drinking water. These machines are built and operated by private companies but it is unclear how much groundwater a company draws in a day. In a country with rapidly depleting groundwater resources, privatising water provision carries the risk of an over exploitation of resources for profit making.

Conclusion

India and Israel's water partnership can significantly serve the interests of both countries. Modi's visit provides a further impetus to the ongoing collaboration between Israeli businesses, state governments and local organisations in India. By upgrading bilateral relations to a strategic partnership, India has formalised cooperation between the two governments and their private sectors. This will encourage entrepreneurship and employment opportunities for Indian youth, while also encouraging innovation in the local industry.

The agreements signed between the two countries and the investment committed to the agricultural and water sectors reflects the commitment of the Indian government to tackling its water management challenges. However, it will need to make tough decisions on managing water demand through water tariffs and increased public awareness. Strong legal structures of accountability are also required at the local level to monitor the activities of private businesses to protect the consumers and the environment. This will call for close monitoring of the legal arrangements by the federal government and the judiciary in view of the frequent conflicts between India's regional governments about the sharing of river waters and other water-related issues.

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