

## Technology for sustainable development and the food-water-health nexus in India

*The Netherlands and India jointly organize a Technology Summit on October 14 and 15 in New Delhi. The Summit focuses on innovation in the food-water-health nexus, and celebrates ten years of Indo-Dutch cooperation in this field.*

### India and its agricultural sector

With an annual growth rate exceeding 7 percent<sup>1</sup> - although recently with a dip to 5 percent - and a population of 1.4 billion people<sup>2</sup>, India is a major player – also in the field of agriculture. Despite the predominantly small scale of most of its farms<sup>3</sup>, the country is:

- the world's largest producer of (mainly buffalo and goat) milk, pulses, millet and jute;
- the world's second largest producer of rice, wheat, sugarcane, groundnut, cotton, vegetables and fruit (leading in mangoes, bananas, papayas and lemons); and
- one of the world's main producers of spices, fish, poultry and livestock.



55 percent of India's population is engaged in agriculture and related activities, which represent around 15 percent of India's GDP. Production has been increasing on average at about 3.6 percent annually since 2011.<sup>4</sup> The Indian government aims to double both farmers' incomes and agricultural exports by 2022<sup>5</sup>; the 75 year anniversary of India's independence. To reach these goals, India will require knowledge and technology for sustainable intensification of its agricultural production.

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<sup>1</sup> World Economic Outlook 2019

<sup>2</sup> 65 percent of the population is younger than 35. The UN forecasts India to become the world's most populous country (overtaking China) in 2027. The population is expected to stabilize around 1.5 billion people in 2050.

<sup>3</sup> Small and marginal farmers constitute nearly 80% of all Indian farmers (India's 2017 Voluntary National Review Report on the implementation of SDGs)

<sup>4</sup> OECD, Review of Agricultural Policies in India. July 2018.

<sup>5</sup> Base year is 2016

Indian agriculture faces challenges related to food and nutrition insecurity (194 million people are undernourished<sup>6</sup>), inequality, climate change, as well as natural resource management and health<sup>7</sup>.

## Water, soil and climate

As described in one of our previous articles, parts of India experience increasing scarcity of ground and surface water, whereas other areas deal with flooding or salinity. Groundwater levels have been dropping, partly because of electricity subsidies for pumping of water for (inefficient) irrigation. India has 157 million hectares of farmland, of which 42 million are irrigated (22 million using groundwater; 20 million using rainwater). In the period 1996-2015, 19 million people in India were affected annually by flooding, and 17.5 million by drought<sup>8</sup>. Moreover, 37 percent of India's total land area is affected by degradation and 25 percent is undergoing desertification<sup>9</sup>. Due to climate change extreme weather events are expected to become more common in the future and global agricultural yields are expected to go down by 2.6 percent by 2050<sup>10</sup>. In India, post-harvest losses of 30 percent pose an additional challenge. Climate-smart agriculture, improved agricultural water management and post-harvest technology can help mitigate and adapt to these changes<sup>11</sup>.

During the Tech Summit a panel will discuss opportunities to collaborate on increasing the 'crop per drop', especially using possibilities provided by key enabling technologies. A study will be presented on different agro-climatic zones in India and their specific water challenges, as well as the Dutch technologies that could provide a solution<sup>12</sup>. A kick-off meeting for the study took place at the Netherlands Embassy on September 5<sup>th</sup>. Based on the study a number of projects will be selected to scale-up climate-smart agriculture. Another study to be presented during the Tech Summit focuses on ways Dutch technology can help reduce post-harvest losses in the apple chain in Northern India.



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<sup>6</sup> FAO 'The State of Food Security and Nutrition in the World, 2019'. Stunting, wasting and anemia represent big challenges.

<sup>7</sup> World Bank CPF

<sup>8</sup> CRED in PBL Netherlands Environmental Assessment Agency "The geography of future water challenges"

<sup>9</sup> OECD, Review of Agricultural Policies in India. July 2018.

<sup>10</sup> FAO, "The State of Agricultural Commodity Markets 2018"

<sup>11</sup> In line with the Global Alliance for Climate Smart Agriculture (GACSA) Strategic Plan 2018-2022

<sup>12</sup> For example precision agriculture, digital technologies, crop insurance, rainwater harvesting, use of improved seeds, and ICT based agro-advisories.

## Health

Antimicrobial resistance (AMR) is a major public health concern in India, with rising rates of AMR across multiple pathogens of clinical importance<sup>13</sup>. Combined with the fact that India is among the nations with the highest burden of bacterial infections, the impact of AMR is likely to be high. There are few regulations against the use of antibiotics for non-therapeutic purposes. India's National Action Plan on Antimicrobial Resistance notes the intention of the Indian government to participate in international collaborations to address AMR. During the Tech Summit, Indian and Dutch stakeholders will be brought together to explore possibilities for collaboration. A pilot in the poultry sector in Andhra Pradesh will be presented, as well as an Antibiotic Pollution Control Project.

On a different note, every year north India's air is polluted because of the practice of paddy straw burning in Punjab and Haryana. The embassy supports an Indo-Dutch project to transform the paddy straw into sustainable new products – for extra farmers income, less air pollution and less deforestation. The Tech Summit will bring together Dutch and Indian stakeholders to work together towards a sustainable business case. The paddy straw burning also attracts private sector investments. Royal Dutch Shell and an Indian venture capital fund have invested € 7.5 mln in Mumbai-based bio-energy company Punjabi Renewable Energy Systems (PRESPL). The company will invest this capital injection to start producing briquettes and pellets as substitute for fossil fuels.

## Start-ups and finance/insurance

India has a bustling startup ecosystem. Between 2013 and 2017, Indian AgriFood startups raised \$1.66 billion<sup>14</sup>. This is not an enormous amount, but it represents 10 percent of global deal activity (as deal sizes are smaller in India). Deals have mostly focused on India's growing middle class (now 57 million) which demands increased quality and convenience, e.g. food service and premium branded foods and restaurants. The number of Indian startups in agritech is small but rapidly growing: investment in startups close to the farm grew nearly seven times over the five-year period. According to Mark Kahn, managing partner of Omnivore (India's dedicated agrifood tech fund), "Small landholdings and fragmented supply chains, alongside rising rural smartphone penetration, offer a compelling opportunity for disruption around the themes of precision agriculture, transparency, financial inclusion, and supply chain efficiency. Moreover, solutions developed by Indian agtech startups will find relevance beyond the large domestic market, as products and services exported to smallholder farmers globally."

Through a pitching battle and tech talks, the Tech Summit will connect Indian and Dutch start-ups. A panel will discuss ways to stimulate agtech investment.

Farmers sometimes borrow heavily to buy inputs but then struggle with debt. In light of this development, the concept of Zero Budget Natural Farming - a way of farming which does not require credit or purchasing inputs - is gaining popularity in India. Also, Government of India is about to change its crop insurance policy, taking clues from public-private schemes used in Turkey and Spain. The Tech Summit will pay attention to the new insurance policy and innovations in risk management such as using satellite data.

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<sup>13</sup> India's 2017-2021 National action plan on Antimicrobial Resistance

<sup>14</sup> AgFunder & Omnivore, India AgriFood Startup Investing Report 2013-2017 (2018)

## Innovation for circular agriculture

In line with the Sustainable Development Goals and the vision of the Netherlands ministry for Agriculture, Nature and Food Quality, LAN India promotes circular agriculture. The Tech Summit provides an opportunity to highlight innovations for and policy dialogue around this topic: not only in the Summit program and field visits, but also by connecting government, businesses and knowledge institutes from both countries – both in Delhi and in Bangalore.



Dutch agricultural exports to India are relatively modest at 100 million euros annually (versus 700 million euros vice versa). This has to do with both tariff and non-tariff trade barriers, a price-sensitive market, a preference for products made in India, a challenging business environment<sup>15</sup>, relatively small farms, and lack of skilled agricultural labor. However, the Netherlands is one of India's main international partners when it comes to developing its agricultural sector and improving its food security. India is especially looking for technology, scientific cooperation, and vocational education and training. It is therefore no surprise that Dutch exports to India mainly concern inputs such as seeds, technology and knowledge. For example, new varieties and better propagation material can increase yields, indoor growing and beneficial insects can reduce the use of harmful inputs and improve water use efficiency and food safety.



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<sup>15</sup> India is ranked at number 77 on the Ease of Doing Business index (although in top 10 of most improved)



Many Dutch knowledge and education institutes are active in India. The Tech Summit will showcase this cooperation, including Indo-Dutch Centers of Excellence where farmers are trained to improve their productivity and sustainability using Dutch knowledge and technology. Following the Summit, a mission of mainly horticultural companies and knowledge institutes will travel to Bangalore for matchmaking and field visits. After that, preparations will start for an agricultural knowledge and innovation mission, focusing on climate smart agriculture. Also, the Netherlands and India will join forces at the World Expo 2020 in Dubai, focusing on agriculture, water, energy and health.



### Links for more information

<https://www.rvo.nl/actueel/evenementen/handelsmissie-met-een-focus-op-innovatie-parallel-aan-het-staatsbezoek-india>

<http://www.ciitechnology.in/>

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