

India must  
deploy  
technological  
advancements  
to turnaround  
agriculture

# LET'S TECH IT FURTHER

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**I**T IS often misconstrued that industry and agriculture are antithetic towards each other. Nothing, however, can be more removed from the truth.

The histories of evolution of the most successful human civilisations stand witness to the glaring fallacies of such an argument. For example, the British industrial revolution of the late 18th and early 19th centuries are greatly spoken of as being the harbinger of the modern industrialised world.

However, not much credit was given to British agricultural revolution which made it possible. During this period agricultural output grew faster than the population and, thereafter, productivity remained among the highest in the world. This rise in productivity allowed migration of labour from agriculture to industry, allowing for the revolution. In such light, if our ambitious 'make in India' initiative, which is largely industry and more specifically manufacturing sector centric, needs to see the light of day, it is imperative that equal impetus is given towards creating a high growth and sustainable agrarian economy.

After a successful green revolution in the 1960s, India's agriculture productivity could not sustain its growth and could be best described as modest in the last two decades. A 2014 GAP report by private-sector voice Global Harvest Initiative pegged the total factor productivity (TFP) growth rate of Indian agriculture between the 1980-2008 periods at a meager 1.9 per cent primarily due to renewed government efforts by means of focused policies and

schemes, but not enough to relieve the economy of agrarian distress. The report also reveals that at present levels of productivity growth, only 59 per cent of India's food demand could be met by 2030.

Therefore, to achieve the government's stated 4 per cent per annum agriculture growth target, the government will not only have to take steps like increase the emphasis on the allied sectors like development of livestock and fisheries, but also take on a technology driven second green revolution focusing on higher farm productivity.

For centuries, technology has been instrumental in solving pressing human problems. However, it is time to dwell why technology infusion has been slow in agriculture which is the lifeline of our economy. One example in this case is that of plant biotechnology. For years now, biotechnology is being falsely projected to be in conflict with other technologies. However, it should be noted these crops have been approved by extensive safety tests mandated by the government of the countries in which the GM crops are grown and/or consumed. It should also be noted that in nearly two decades of usage across the world, numerous studies have been conducted and submitted to the government authorities and no credible harmful health effects have been brought to the table. What is even more disconcerting is the fact that the opponents to this technology like to base their arguments on emotional, unscientific and unsubstantiated reasons over credible scientific studies that suggest otherwise.

When 17 million farmers from

28 countries adopt GM crops and grow them over 181.5 million hectares of cultivated land (ISAAA Brief 49- Global Status of Commercialised Biotech/GM Crops: 2014), they do so for a reason which is beyond the emotional benefit. The fact that GM crops are the fastest adopted and most tested crop technology in contemporary history itself proves that GM crops are not only resilient but also beneficial to both farmers and consumers. The fact that there has not been even one serious or credible health complaint in the last two decades corroborates further that GM crops bear no harm to human health.

The Indian example of Bt cotton is rather conclusive in itself. Bt Cotton was the first GM crop (and till date the only one) to be allowed to be commercialised in India back in 2002. Since then India has gone from being a net importer of cotton to be the world's largest producer and second largest exporter of cotton. The total production has increased by more than 250 per cent, yield has increased by 60 per cent and domestic consumption by 80 per cent. Bt Cotton has seen 95 per cent adoption in the country and acreage of the crop has increased by over 50 per cent. All these statistics suggest that Bt Cotton is the most celebrated success story in agriculture since the success of the green revolution.

Some recent reports have tried to link a recent whitefly pest attack on the cotton crop in Punjab and Haryana with Bt cotton — however, without any scientific basis or evidence. It is important to note that Bt cotton technology is to safeguard cotton crops from the menace of bollworm only

and not any other pests or diseases. The resistance to whitefly can be developed within the genetic pool of the plant and it has nothing to do with Bt cotton. It is like a vaccine to safeguard us from a particular disease and not for all kinds of diseases.

In India, Bt and herbicide tolerance are not the only GM traits available. We have been importing pulses and edible oil at a significant cost to our foreign exchange reserves and economy for decades. Use of biotechnology in these crops can help lower our import bill and that money can be utilised for better purposes. Water use efficiency, which can help us grow crops with less water; nitrogen use efficiency, which can help us to grow crops with less use of nitrogenous fertilisers; salinity tolerance which can help us to grow crops in saline soil are some of the examples of the technologies waiting to be introduced in India for the benefit of the farmers.

Contrary to what the naysayers would like us to believe, the success of GM crops across the world is undisputed and well documented. Several credible global studies like the International Service for the Acquisition of Agri-biotech Applications (ISAAA), a *meta-analysis of the impacts of genetically modified crops* by PLOS ONE and *GM crops: global socio-economic and environmental impacts 1996-2010* by PG Economics, confirms that such crops not only increase yield but also enhance nutrition levels of food crops. Recent publications by ISAAA also confirm financial benefit of Bt cotton to Indian farmers.

In fact, it is very paradoxical that while the hurdles towards commercialising of GM crops still

exist in the country due to unclear policy support. Publicly controlled institutions continue to invest heavily in their research and are experiencing a lot of success in doing so as well. For example, apart from private companies, there are many premier and public institutes and state agricultural universities in the country which are engaged in research and development of new technologies to provide solutions to our agriculture challenges. Some of these institutes and universities are Indian Council of Agriculture Research (ICAR), Punjab Agricultural University, Tamil Nadu Agricultural University, Assam Agricultural University, University of Agricultural Sciences, Dharwad, in crops like brinjal, chickpea and rice.

Those against the technology, often allege that India's biodiversity is at stake with the introduction of GM technology and the long term impacts include decrease in biodiversity on the planet. However, they fail to acknowledge that GM crops go through exhaustive and rigorous safety testing on the environment, insects, other plants, soil health, animals and birds before they are officially approved. Further, we mustn't forget that India has a bio-safety regulatory regime in place that is second to none in the world. All internationally accepted standards are followed by the Indian regulatory system and it is evolving process as more knowledge is acquired and assimilated.

Indian agriculture is not a homogenous entity and hence there is no single solution. However, several unexplored opportunities exist to use GM technology. At no point does this mean that organic cultivation is

not good. But to expect them to be supplementary ways of cultivation is absolutely incorrect.

The European Union has concluded, after more than 130 research projects covering a period of more than 25 years of research and involving more than 500 independent research groups that 'GMOs per se are not more risky than their conventional counterparts. So there is no need to avoid consuming GM foods. The sale of products on the pretext of 'non GM' is merely a sales gimmick.

There are only 12 GM crops which have been commercialised in the world. They are maize, soybean, cotton, canola, sugarbeet, papaya, squash, alfalfa, poplar, tomato, sweet pepper and brinjal. In these crops if someone offers a non-GM option to the consumer one can understand the marketing thought behind it. But, if someone advertises that his mango juice is non-GM it is misleading because there is no GM mango in the world. Various tricks are being used to charge a premium price from the consumers!

Progressive human civilisations have historically harnessed the power of scientific research and development to positively impact the growth of their communities and make their lives more comfortable and dignified. They have used it to enhance the quality of life of their communities by bringing about scientific solutions to their day to day problems. The question is, will the India of today do the same? ■

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