

BIOTECHNOLOGY IN INDIA

The Indian biotechnology sector is one of the fastest growing knowledge-based sectors in India and is expected to play a key role in shaping India's rapidly developing economy. Currently, India holds two per cent share of global market. With numerous comparative advantages in terms of R&D facilities, knowledge, skills, and cost effectiveness, the biotechnology industry in India has immense potential to emerge as a global key player.

The Indian biotech market was estimated at US\$ 2.80 billion in 2007–08 and is likely grow at a compound annual growth rate (CAGR) of 30 per cent.

India became the fourth largest adopter of biotech crop in the world, displacing Canada, in 2008 and planting Bt cotton on 7.6 million hectares (82 per cent of the total cotton are in the country), according to the International Service for the Acquisition of Agri-biotech Applications (ISAAA). A record five million small and resource-poor farmers planted Bt cotton in 2008, significantly up from only 3.8 million farmers in 2007, the ISAAA said.

According to a report by the Confederation of Indian Industry (CII) and consultancy firm KPMG, the Indian biotechnology sector is likely to become a US\$ 5 billion industry by 2010. The report stated, "India is ranked among the top 12 biotech destinations in the world and is the third biggest in Asia-Pacific in terms of the number of biotech companies."

India is also gaining importance as a clinical trial destination. The global clinical research outsourcing market is projected to touch US\$ 23 billion by 2011, with consultancy firm KPMG estimating that India will corner 15 per cent of this in two years.

A growing number of Indian biotechnology firms are now providing research and development (R&D) services to global pharmaceutical companies. The vaccines' market in India will also lead the demand growth in South-East Asian countries as many new vaccines are set to be launched in five years. Global vaccine sales were US\$ 21 billion in 2008 while the Indian market was valued at US\$ 360 million, thus, creating major opportunities for Indian biotechnology and pharmaceutical companies.

- The UNIDO Centre for South-South Industrial Cooperation (UCSSIC) has acknowledged cashew apple as a substitute to food crops that are currently being used for ethanol production and India is one of the countries being targeted by the UNIDO.
- India will replace 10 per cent of its transport fuels with biofuels like ethanol and jatropha in the next 10 years to cut carbon emissions.
- Another step towards maximising energy efficiency is Co-generation - a concept of producing two different forms of energy from one fuel. The bagasse-based co-generation option, which started as a cost-saving measure by sugar companies, is one such profitable option. India is likely to add 1,200 MW bagasse-based power capacities during the 11th Five-Year-Plan.
- The biomass from bamboo has been found to be a good source of high energy and can be used as green coal, which contains fewer pollutants and is a renewable source of energy.

Market Size and the Key Opportunity Segments

According to an industry survey, carried out by Association of Biotech Led Enterprises (ABLE), biotechnology industry in India has notched up a growth of 20 per cent during 2007–08 and the revenues earned were worth US\$ 2.56 billion as against US\$ 2.1 billion during the previous fiscal. Research services touched US\$ 500 million and bio-IT (bioinformatics) was US\$ 250 million.

Further according to the findings, going by the current trend and the new biotech policy of the central government, the sector is poised to generate US\$ 13–16 billion by 2015.

The Indian bioinformatics market, which deals with creation and maintenance of extensive electronic databases on various biological systems, is set to double by 2010, from US\$ 32 million to US\$ 62 million by 2010, according to a report by research firm ValueNotes Outsourcing Practice.

Out of the five broad categories—biopharma, agri-biotech, bioinformatics, bioindustrial and bioservices—that the biotech industry in India can be divided into, according to the product offerings, the first three are the most important segments according to their revenue contribution.

- The bio-pharma industry accounted for almost 70 per cent of the overall revenues in 2007-08 and it is likely to touch US\$ 4.60 billion by 2012-13. It is estimated that more than 40 per cent of the total 325 biotechnology companies in India are in the biopharma segment.
- Fuelled by the robust sales of BT cotton, the bio-agriculture sector is one of the fastest growing sectors in the industry. India became the fourth largest adopter of biotech crop in the world, displacing Canada, in 2008 and planting Bt cotton on 7.6 million hectares (82 per cent of the total cotton are in the country), according to the International Service for the Acquisition of Agri-biotech Applications (ISAAA).
- India is a significant exporter of bioinformatics and bioservices, with the segment driving 90 per cent of its revenue from outsourcing. Similarly, the bioservices sector holds great promise with a well-developed R&D capability and a large patient base for clinical trials.

Biotech Hubs

India finds a place amongst the top 10 biotech hubs in the world and is one of the five promising biotech markets in the Asia-Pacific region.

Malaysia is keen on enhancing its partnerships with Indian biotechnology and life sciences companies. The country plans to explore avenues in India and would also invite Indian companies to set up units in Malaysia, said Mr Selvam Ramaraj, Senior Vice-President, Industry Development Division (Healthcare), BiotechCorp, the lead development agency for biotechnology industry in Malaysia.

Being home to 200 diverse companies, the biotech cluster in Bangalore alone leads the pack, whereas other cities like Hyderabad, Chennai, Pune and Mumbai also have come up as preferred destinations to set up a biotech facility.

- According to the Cushman & Wakefield analysis, Bangalore is estimated to witness approximately 6.5 million square feet demand from this sector alone between 2007 and 2010.
- Hyderabad has witnessed infrastructural development in the biotech domain wherein the Knowledge Park, the Biotech Park, Genome Valley and other projects have come up giving the city an advantage over others. Over 53 international biotech companies have established their operations in the Genome Valley over the last one year. Additionally, this city will witness development of two biotech special economic zones (SEZs) and three biotech parks in the next couple of years.
- The Andhra Pradesh Industrial Infrastructure Corporation (APIIC) has allotted land to 19 companies so far in the Biotech Park Phase III at Karakpatla, Medak district.

Major investments

Investments, along with outsourcing activities and exports are the key drivers for growth in the biotech sector.

As per the survey carried out by Association of Biotech Led Enterprises suggests, 56 per cent of the sector's total revenue of US\$ 1.44 billion came from exports. Around 70 per cent of exports were from bio-pharma, and 26 per cent from bio-services segments.

Private equity (PE) investments in the life sciences sector clocked US\$ 183 million during the 10-month period between January and October this year compared with around US\$ 173 million for the same period in 2007.

Some of the major investments in the sector are as follows:

- Syngene International, a subsidiary of Indian biotechnology major, Biocon Ltd, and Bristol-Myers Squibb Company announced the opening of a fully dedicated research and development facility for Bristol-Myers Squibb in Biocon Park, Bangalore.
- Avesthagen has set up Avesthagen Latam SpA in joint venture with a Chilean-based biotech company, Uxmal S.A, to promote research and development of bioactives for commercialisation. The new company will be based at Santiago in Chile and Avesthagen will hold 75 per cent of the company. About US\$ 6 million investment is expected to be made in the joint venture in the next five to six years.
- CRYO-SAVE Group, the Netherlands-based stem cell company with a large Indian presence, plans to increase the number of stem cell donors in the country by opening more representative offices. The company plans to invest US\$ 2.66 million in its Bangalore-based subsidiary for over three years.
- Bharat Biotech International Limited, a Hyderabad-based manufacturer of vaccines and biotherapeutics, has launched COMVAC5, a single-shot pentavalent combination vaccine, which contains the first indigenously developed and manufactured haemophilus influenza type b (Hib) vaccine in India and the only Hepatitis B vaccine in the world to be manufactured without the use of cesium chloride.
- Bangalore-based Cellworks Group Inc., which also has an office in California, has raised about US\$ 8 million-US\$ 10 million from a California PE investor.
- Bharat Biotech's rotavirus vaccine (116E) is entering phase 3 of its clinical trials. The vaccine treats severe dehydration and diarrhoea in infants and young

children. Bharat Biotech and its funding partners have already invested US\$ 28 million-US\$ 30 million in vaccine development so far and are looking to spend another US\$ 30 million on phase three clinical trials alone.

- Mahindra Shubhlaabh Services, an agri-business firm of Mahindra & Mahindra Ltd group, has entered into an alliance with HZPC Holland BV to produce market and export high-quality seed potatoes from India.
- Celestial Biologicals Ltd (CBL), an associate company of Intas Biopharmaceuticals Ltd, and GE Healthcare, has announced a collaboration to set up India's first Good Manufacturing Practice (GMP) compliant plasma fractionation facility in Ahmedabad. The facility will be India's first fully-integrated chromatography-based plasma fractionalisation facility, involving an investment of US\$ 19.66 million- 39.33 million over the next two years.

Thus, Indian biotech market has seen a surge of investments through the foreign direct investment (FDI) route, private equity and hedge funds, for collaborative R&D, bioinformatics, contract research and manufacturing and clinical research.

Government Initiatives

The Government of India and the UNESCO fully realising the need of training and education for generating interdisciplinary human resource relevant to biotechnology, took a joint decision to establish the Regional Centre for research, training and education in biotechnology under the auspices of UNESCO. The UNESCO Regional Centre for Biotechnology will come up in Faridabad, Haryana by next year.

Further, the Department of Biotechnology (DBT), Govt of India, has also decided to set up a unique Health Biotech Science Cluster (HBSC) at Faridabad.

The DBT is exploring avenues to fund research, focus on the opportunity of bio-similar products and create infrastructure to scale-up human resources to support a shift to high-end research in the long term. The department has recently got approvals from the Union Finance Ministry for US\$ 39.33 million fund for vaccines that would support a range of programmes including clinical trials, vector development, adjuvant development and intellectual property. Another such funding proposal from the DBT is the US\$ 68.79 million corpus, over a three-year period, where soft loans would be given at two per cent interest for bio-similar projects.

The Centre is also looking to support innovation from universities and a Bill to empower scientists and help them commercialise their innovations is expected to be passed by the end of the year.

- The Karnataka government is proposing to establish biotech parks in prominent cities to promote the biotechnology sector in the state. Chief Minister Mr B S Yeddyurappa, in his budget proposals for the year 2009-10, said that the government would take steps to establish biotech parks based on the recommendations of the Biotechnology Mission.
- The Andhra Pradesh Industrial Infrastructure Corporation (APIIC) has allotted land to 19 companies so far in the Biotech Park Phase III at Karakpatla, Medak district. The biotech companies such as Avesthagen Ltd, Indian Immunologicals Ltd, Neozene Biosciences, Parsvanath SEZ Ltd, Brinda Life Sciences and Globion India Pvt Ltd have been allotted land. Over the next five years, over US\$ 2.69 billion is likely to be invested by these companies.

- The Phase III of Genome Valley Biotech Park was inaugurated on January 28, 2009. Nineteen companies have confirmed setting up their operations here on the 600-acre facility at Karakapatla, near Shamirpet on the outskirts of Hyderabad, Andhra Pradesh.
- The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the DBT has launched a project for establishing a platform for translational research on transgenic crops (PTTC).

Recent Achievements

Some of developments in the recent times bear testimony to the robust growth momentum in Indian biotech industry:

- Biotechnology major Biocon has bagged the 2009 BioSingapore Asia Pacific Biotechnology Award. Biocon was adjusted the 'Best Listed Company' based on significant market capital, sound business model and excellent management team.
- Indian scientists led by the Indian Space Research Organisation (ISRO) have discovered three new species of bacteria in the upper stratosphere that they claim to be not found on the earth. The micro-organisms—resistant to ultra-violet (UV) radiation—were detected 40 km from the earth's surface during a joint experiment.
- Ocimum Biosolutions, an integrated genomics company based in Hyderabad, announced that it is now an authorised provider for services using NuGEN Ovation Systems for sample preparation. This partnership enables researchers in India, for the first time, to conduct gene expression profiling from a wide range of clinically relevant sample types, such as small, compromised, or formalin-fixed, paraffin-embedded (FFPE) tissues.
- Syngene International, a subsidiary of Biocon Group, announced that it will offer fully integrated drug discovery services by partnering with Sapient Discovery, a US based Biotechnology Company. Syngene provides integrated chemistry, biology and biologics services to support development programs of pharmaceutical and biotech companies worldwide on a platform of confidentiality and intellectual property protection.
- TCG Lifesciences Ltd has been conferred with 'Excellence Award' and its Managing Director, Swapan Bhattacharya, won the Udyog Rattan award, by the Institute of Economic Studies (IES) for the outstanding achievements in the field of life sciences and contribution in India's industrial development.

Trends: Drug testing

In an indication of India's growing importance as a clinical trial destination, multinational pharmaceutical firms are showing interests to get approvals to test their new drugs in the country. At least a dozen global firms, including Roche, Pfizer and Astra Zeneca, got a nod from the Drugs Controller General of India (DCGI) to conduct over 50 clinical trials on Indian volunteers.

The global clinical research outsourcing market is projected to touch US\$ 23 billion by 2011, with consultancy firm KPMG estimating that India will corner 15 per cent of this in two years. While the industry attributes this to the growing interest of pharmaceutical majors in emerging markets like India, some medical experts see low cost as the main attraction.

India allowed concurrent clinical trials (of the same drug in different locations across the world) four years ago. While the DCGI got around 100 applications for conducting such trials in 2005, this grew to 170 and 200 in 2006 and 2007, respectively. In 2008, the DCGI got over 350 applications. The applications cut across therapeutic areas and come from almost every significant global pharmaceutical firm.

Road ahead

India is already being globally recognised as a manufacturer of economical, high quality bulk drugs and formulations. With a huge base of talented, skilled and cost competitive manpower, and a well-developed scientific infrastructure, India has great potential to become a leading global player in biotechnology.

According to a survey by Ernst and Young, India is likely to become one of the global leaders in biotechnology, and based on the number of biotech companies in the country, is presently ranked third in the Asia-Pacific region.

The future looks bright for the industry and industry experts feel that Indian firms must focus on buying overseas biotechnology units in countries like the US, which are seeing plunging valuations due to the global meltdown.

Note: Exchange rate used: 1 USD = 50.8468 INR

Related News

Avesthagen ropes in Harvard for Parsi project: [The Hindu Business Line](#) May 26, 2009

Roche eyes 2-3% global turnover from India: [Business Standard](#) May 12, 2009

Biocon eyes biogenerics ride to US: [The Hindu Business Line](#) April 28, 2009

Qiagen to expand distribution base in India: [Business Standard](#) April 22, 2009

Monsanto to invest INR 500 million in research: [The Hindu Business Line](#) April 01, 2009

Now, a nano diagnostic device for deadly diseases: [The Financial Express](#) March 31, 2009

IT firms hiring pharma guys for life sciences biz: [The Economic Times](#) March 30, 2009

Reliance arm to reap big gains from biodiesel: [Business Standard](#) March 27, 2009

Karnataka plans biotech parks in major cities: [Business Standard](#) February 24, 2009

India fourth largest adopter of biotech crop in the world: [The Economic Times](#) February 19, 2009

Vaccines market set for explosive growth: [The Hindu Business Line](#) February 04, 2009