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ASIA EDITION

# Renu Swarup: Indian bioscience to reach $100bn by 2025

20 May 2013 | Opinion | By BioSpectrum Bureau

The Department of Biotechnology (DBT) has, since its inception in 1986, been playing an important catalytic role in promoting the robust growth of the biotech sector. The growth of the biotechnology industry over the last decade has been exceptionally satisfying. It is one of the sectors which maintained a steady growth rate and has recorded a turnover of $4 billion.

The initial years focused on building the capacities for research in terms of both human resource and infrastructure across the country, leveraging international strengths through enriched international collaborations and creating and developing a robust regulatory system. In 2001, DBT released its vision which emphasized on "attaining new heights in biotechnology research, shaping biotechnology into a premier precision tool of the future for creation of wealth and ensuring social justice-specially for the welfare of the poor".

The intention of the department was to ensure that the potential of the sector is optimally utilized, and this was very clear from the mission statement of DBT, which stated that it would launch a major well directed effort with significant investment, for harnessing biotechnological tools for generation of products, processes and technologies in order to enhance the efficiency, productivity and cost effectiveness of agriculture, nutritional, security, molecular medicine environmentally safe technologies for pollution abatement, biodiversity conservation and bioindustrial development. DBT's mission statement also emphasized that it would create strong infrastructure both for research and commercialization, ensuring a steady flow of bioproducts, bioprocesses and new biotechnologies.

In the 10th year perspective plan, it was pointed out that in order to realize the full potential of biotechnology as a frontline area of R&D, with an overwhelming impact on society, the Indian biotechnology enterprise will be systematically nurtured at three distinct levels, including enhancing the knowledge base and generating highly skilled human resource, nurturing leads of potential utility and bringing bioproducts to the marketplace.

In 2007, the National Biotechnology Development Strategy (NBDS) was announced which focused on "the future bioeconomy: translating life science knowledge into socially relevant, eco friendly and competitive products". Through this strategy biotechnology was recognized as sunrise sector that needed focused attention. A major emphasis was on promoting the biotech industry, and DBT made an important announcement that 30 percent of its budget would be spent on public-

private partnership programs and a Biotechnology Industry Research Assistance Council (BIRAC) would be launched to nurture industry R&D and act as an interface between academia and private sector.

In a major departure from normal funding mechanisms, it was decided that up to 30 percent of DBT's budget would be invested in public-private partnership schemes by the end of the 11th Plan. This was mainly to promote innovation, pre-proof-of-concept research, accelerated technology and product development in biotechnologies related to agriculture, human health, animal productivity, biomanufacturing and environment.

Major industry partnership schemes were launched to nurture and promote discovery and innovation research in biotech industry, including the Small Business Innovation Research Initiative (SBIRI) and Biotechnology Industry Partnership Program (BIPP). The setting up of BIRAC as a not-for-profit, public sector company of DBT has ushered in a new revolution of innovation research.

Over the last four-to-five, the biotechnology sector has witnessed a dramatic change. The involvement of the academia with the industry has increased multiple folds and the level of innovation research has improved with this involvement. The entire sector, from early start-ups to entrepreneurs to small and medium enterprises (SMEs) and large companies are all working to achieve a common goal of new and novel product and processes development to enable growth of the biotech sector, not only in the domestic market but also globally.

The various financing options available for start-ups such as Biotechnology Ignition Grant (BIG) and the availability of incubation space and the associated mentoring support are making this sector attractive. We now see more students and scientists from research institutes and industry setting up their own enterprises and working to convert their novel idea into a business models.

With continued efforts to improve the infrastructure, trained human resources, research capacities and with the appropriate ecosystem in place, the country is today well poised to achieve the ambitious target of $100 billion by 2025.