

Changing Profile of the Indian Vaccine Innovation System. Kunal Sinha. Segment Books, New Delhi. 2017. 332 pp. Price: Rs 1495.

Innovation system study has been one of the popular streams which evolved in the Western context and spread across the globe. Scholars have looked into different key economic sectors mainly from the national, regional and sectoral systems perspective. This has led to the understanding of innovation and learning environment at different levels in the system. Initially the focus was more on developed economies and scholars have observed the matured systems of innovation in those contexts. However, more recently, the focus has shifted towards exploring and understanding the innovation systems of the developing countries across various sectors. In this context, the book under review is an important contribution, more so as it is authored by an Indian scholar. This book explores the health sector by looking into biotechnology innovation system in general and vaccine innovation system in particular. It looks into the processes of development of various vaccines and explores the external shocks and endogenous developments in the system.

The book is divided into seven chapters and the introduction chapter presents the background of the study. It highlights the biotechnology innovation system in India with focus on pre-independence and post-independence scenario in vaccine innovations and sets the tone of the book. Further, it puts forth the analytical framework of the research and lists out various components of the vaccine innovation system in India.

The second chapter 'Issues in vaccine innovation system in India' is a theoretical discussion on innovation systems and starts with its definition. It further discusses different models of innovation system and gives a detailed account of

six generation models of innovation, which are helpful in understanding the innovation processes. The theoretical discussion is followed by conceptualization of biotechnology innovation system and case studies from various countries. This is an important segment with focus on different possible components and issues in the biotechnology sector in general. The chapter has covered many issues such as pharmaceutical industry, role of vaccine, key actors and issues and policy imperatives for this sector.

The third chapter focuses on preventive diseases and vaccines and gives the global status of vaccine innovations. This chapter further narrows down the discussion to the Indian context and presents the historical sketch of vaccine innovations within the country. Three specific diseases namely Influenza, Polio and Hepatitis B have been discussed in detail. The discussion on international level innovations in vaccines at the end of this chapter makes it interesting and relevant.

The fourth chapter is devoted to the discussion on intellectual property rights (IPR) and vaccines access issues. IPR is one of the important institutions considered in the innovation system and health sector is perhaps the most benefited from such institutions. The discussion in this chapter has posed certain questions relevant for vaccine sector in India. This makes reader comfortable in understanding the context of IPR and pharmaceutical industry. The fifth chapter is on networking in a given system, which is again another important component, especially in vaccine innovation system. This highlights on public-private, private-private and informal networks in the vaccine innovation system. For instance, the Department of Biotechnology has been facilitating various networks within the system. It has created collaborations among different actors and outcomes of such networks are highlighted in the debate.

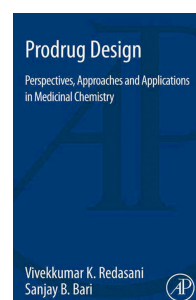
The most important assumption of the system of innovation is that it is not a static system, but is dynamic in nature and vaccine sector is not devoid of it. This is the main theme of the sixth chapter. It explores the changing trends and patterns in the vaccine innovation system in India. This dynamism is due to continuous interaction of different actors and institutions in a complex manner. The cases of several vaccine R&D related firms and institutions have been dis-

cussed to corroborate the argument. Lastly the seventh chapter presents the concluding remark and policy implication of this study.

Therefore, the book has focused on a relevant sector and the way the author has used the system of innovation and contextualized it for vaccine innovation system in India is commendable and inspires researchers to look into other sectors. The discussion on theoretical framework is simplified and situating the case in the context has made it more thought-provoking. The language is lucid and one can easily grasp the meaning and nuances the author wants to communicate. The book is a rich source in terms of data and helpful to the scholars, industry, enthusiasts and policy makers working in the field of biotechnology and vaccine innovations in and outside India.

HEMANT KUMAR

*Centre for Studies and Research in Science,
Technology and Innovation Policy,
School of Social Sciences,
Central University of Gujarat,
Gandhinagar 382 030, India
e-mail: hemant@cug.ac.in*



Prodrug Design: Perspectives, Approaches and Applications in Medicinal Chemistry. Vivekkumar K. Redasani and Sanjay B. Bari. Academic Press, An Imprint of Elsevier, 125, London Wall, EC2Y 5AS, UK. 2015. x + 73 pp. Price: US\$ 49.95.

Prodrugs are gaining importance in drug development and delivery. Several of the unwanted properties present in the lead molecule are overcome by their conversion into a prodrug. Though the art of synthesizing prodrugs is becoming important now, several molecules have existed earlier as prodrugs. A classical example is methyl salicylate.

This book covers the history, concept and details about accepted prodrugs in the market or clinical trials. It consists of

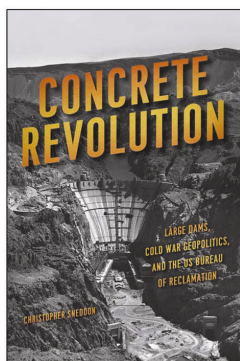
seven chapters covering topics ranging from introduction, concept of prodrugs, types, approaches, applications, role in drug discovery, and future. All chapters clearly enunciate the concepts with appropriate examples. A detailed description of the accepted groups is also included in the book.

This book will be of interest for those exploring different groups to increase the efficacy and bioavailability of the identified molecules, and also experts in the field for formulating the identified molecules.

The book comprises mere 71 pages, which is less for a topic of this importance. It is suggested that the authors include more details about the concept and examples in the next edition to make it a ready reckoner for medicinal chemists/drug discovery scientists. At present, the book can be recommended to colleges where medicinal chemistry is taught as a course and for scientists who wish to understand the definitions of each class of prodrugs.

S. CHANDRASEKHAR

CSIR-Indian Institute of Chemical
Technology,
Uppal Road,
Hyderabad 500 007, India
e-mail: srivari@iict.res.in



Concrete Revolution: Large Dams, Cold War Geopolitics, and the US Bureau of Reclamation. Christopher Sneddon. University of Chicago Press, 1427 E. 60th Street, Chicago, IL 60637, USA. 344 pp. Price: US\$ 45.00.

Need it be said that big dams epitomize development all over the world. Else, the Indian Premier Jawaharlal Nehru would not have called these gigantic structures ‘temple of modern India’ and the Ethio-

pian Emperor Haile Selassie would not have hailed big dams as ‘treasure trove of wealth’. Over 50,000 big dams have been built worldwide ever since the Hoover dam had obstructed free-flowing Colorado river into an energy powerhouse. In recent years, however, large dams have come under scrutiny because of social disruptions, cultural dislocation and ecological value. Much of these concerns were captured by the World Commission on Dams in 2000.

Yet, these engineering monoliths continue to obsess several countries including India and China, who persist with dam building despite these being the cause for lingering water-sharing disputes between riparian states and countries. While a great deal is known about the socioecological costs of modern dams, the political dimensions of dam building have remained largely obscure. Water may seem innocuous, but dams have transformed it into a contested resource through acquisition, diversion and control. And, it has seemingly been done on a purpose. Geographer Christopher Sneddon traces the twentieth-century history of dam building to conclude that ‘dams have been exceptionally thick with politics’.

Concrete Revolution offers a comprehensive analysis on the motive behind proliferation of dam building in pursuant of US President Truman’s Four Point program of international development. Technical assistance for dam building was a primary disguise for staving off the presumed global expansion of communism, alongside enhancing the capacity of American business interests to increase their global influence and investment opportunities as a bargain. The global economic crises being experienced in the US at that time were critical factors in promoting the role of the federal government in massive public works schemes in as many as 100 countries, which otherwise may not have been feasible.

Presenting snapshots of the US Bureau of Reclamation’s early forays into big dam development across several countries, Sneddon makes a compelling argument in favour of dams as political objects rather than instruments of impartial science. It suited the developing world no less, as dam-driven water resource development travelled geographically without offending radically different ideological and cultural contexts. Notable is the manner in which the

concrete revolution integrated political ecology of construction technologies with techno-political networks.

It is hard not to concur with Sneddon, whose incisive analysis provides fresh insights into understanding the assemblage of networks that maintain and produce large dams. So effective are these networks in promoting large dams that techno-political proponents of hydro-power development perceive ecological disruptions as an unfortunate trade-off against the ‘greater good’ of economic development. No wonder, therefore, that the impact of dams on humans and ecosystems is largely ignored by the decision-making processes.

Sneddon takes a step further to suggest that the assemblages of networks that produce and maintain large dams are not only undemocratic but rarely allow any discussions on alternatives to dams. Loaded as this assertion might be, the fact that the governments have overlooked social and ecological disruptions caused by dam building clearly justifies it. Even the Bureau of Reclamation had sensed this dichotomy. Backed by information on less than desirable impacts of large dams, the Bureau’s Assistant Commissioner Gilbert Stamm had proclaimed ‘We haven’t learned how to apply our vast technical advances to meet the basic values and desires of people.’ This statement was made in 1969 by which time the Bureau’s interest in dam building had started waning, but elsewhere in the world interest on dam building persists.

Concrete Revolution offers an authoritative enquiry on large dams, and presents analytical insights into the processes and actors involved in nurturing the techno-political networks. But the book leaves the discerning reader to dig deeper to understand the local and national political ecologies and political economies that continue to stick to dam building as a panacea to fill the developmental void. Part of the problem is that the developing country governments have yet to imagine a ‘world without dams’, whereas river restoration and dam removal have started to gain prominence in the developed world.

SUDHIRENDAR SHARMA

7 Triveni, A6 Paschim Vihar,
New Delhi 110 063, India
e-mail: sudhirendarsharma@gmail.com