Furthermore, water use problems in a developing country like India are rooted in the fundamental notion that water is simply ‘an essential resource which is required by humans, livestock, wild animals and all the flora and fauna’ (p. 11). There is no room for considering ‘wise use’ of water; it is inconceivable to price water based on its future scarcity or value from non-human uses. The simple rule of the game is for each individual to exploit water at one’s own access till the immediate and essential need is met. Chandrakanth calls for a fundamental change in this basic understanding through improved literacy and governance structure.

What I find interesting about the book is that it has new information and insight for both economists and hydrologists. Drawing from the analogy of the ‘Six Blind Men and an Elephant’, Chandrakanth reminds readers that the water use problem is viewed differently from different stakeholders (p. 16). Therefore, the water use decisions and solutions to its scarcity are limited by each user group’s inability to understand the complexity of the entire hydro-economic system. There is a good deal of discussion on the hydrological processes underlying groundwater extraction, cone of depression, well interference and well failure. Resource economists should find this extremely valuable in sharpening their understanding of the hydrological reasons which externality emerges in the first place from, and why water is a resource, not just a factor of production (chapter 2). Similarly, hydrologists, water engineers and resource managers will find valuable insight on why the exploitative nature of water harvesters is a collective outcome of the inefficient existing markets and institutional process. Chapter 3 describes the nature of externality in irrigation agriculture, a classic market failure problem. Moving toward a more sustainable agricultural irrigation would require policy changes that ensure improved water use efficiency both temporally and spatially. For students interested in agricultural irrigation, this is a one stop reading where they find a comprehensive set of concepts, theory, practical examples and case studies, and policy solutions to agricultural water use problems.

Sand mining (chapter 4) is a stark reminder of yet another urban-rural conflict. Rampant development in metropolitan areas such as Bengaluru, India, has created a quantum jump in the demand for sand. Chandrakanth estimates the price elasticity of demand for sand at -0.88. This price inelasticity is not a good news for agriculture. As the urban demand for sand continues to surge, the rate of sand mining in the nearby riparian areas increases, causing reduction in groundwater recharge, changes in cropping pattern and attendant economic losses in agriculture.

Chapter 5, although a bit scattered, stresses the importance of securing groundwater recharge from rainfall. Geologically speaking, with 65% of the country being situated on hard rock (with states like Karnataka, 99%), the groundwater recharge rate tends to be naturally low. With some insightful example, the author illustrates the severity of the exploitative nature of the current extraction practices. Farmers’ education and appropriate water use policies become even more essential in hard rock regions than other places. Readers unfamiliar with fundamental concepts and tools in water resource economics will find chapters 6 and 7 useful to gain better understanding of the practical applications of these tools as well.

Chapter 8 explores the economic consequences of well interference for the value of irrigation water. As the number of wells and the rate of well failure increase, the cost of water increases and its value decreases. Chapter 9 presents the contrasting characters of conventional and drip irrigation systems for various crops in terms technical efficiency and marginal values of irrigation. The comparison is based on empirical estimates, and therefore, provides policy-relevant insights. It is further noted that the rising water scarcity has pushed farmers to become more water efficient by adapting drip irrigation. While initial establishment costs are higher for drip irrigation system than for the traditional system, the former is more efficient than the latter and has become a necessity in the midst of growing water scarcity.

Chapter 10 gives the estimates for the economic contributions of various watershed development programmes in Karnataka, particularly sujala programme. Chapter 11 is an extensive discussion of water markets and how various factors, including cropping pattern, irrigation system, institutions and market transactions govern the efficiency of water trade.
among farmers. The chapter is replete with empirical estimates of value of irrigation water under various agro-climatic and cropping conditions, yielding useful policy insights.

Chapter 12 is for advanced readers with background in dynamical mathematical modeling. With this approach Chandrakanth demonstrates that failure to consider the user costs of current water extraction will lead to sub-optimal exploitation of the resource. He further argues that this myopic approach not only leads to economic inefficiency, but also to intergenerational inequity. Like in the previous chapters, he develops empirical application of the theoretical model for underground aquifers that are recharged by tanks and canals. Comparing the time paths of water table, harvests and net revenues between extraction decisions with and without user costs should sharpen the readers’ understanding of the inefficiency arising from myopic water use decisions.

Chapter 13 gives a good account of various regulatory- and incentive-based policy options for increasing water use efficiency and minimizing reciprocal externality. The author identifies existing institutional and policy failures that continue to pose threat to sustainable water use and food security in irrigated cultural belts of India. Among other policy failures, the author is particularly concerned about the poorly informed electricity subsidy policy, which serves as a perverse incentive and promotes over-exploitation. A more sustainable policy would entail equitable and selective subsidy rather than universal entitlement. The author also concludes that participation, no matter how small, of farmers in water management and in decision-making water use decisions will lead to sub-optimal exploitation.

Particular attention is devoted to the institutional and policy failures that concern about the poorly informed electricity subsidy policy, which serves as a perverse incentive and promotes over-exploitation. A more sustainable policy would entail equitable and selective subsidy rather than universal entitlement. The author also concludes that participation, no matter how small, of farmers in water management and in decision-making water use decisions will lead to sub-optimal exploitation.

The book is admirably indexed and contains clear images, covering most of the topics relevant to undergraduate level organic chemistry. Apt reaction schemes, energy profile diagrams and figures with precisely informative labels, supplement the discussions in all chapters. Additional reading materials are aptly suggested in each chapter. Barring the spelling errors in a few places and the significant brevity in discussion of certain principles, the new edition maintains the Dictionary nature of the first edition and serves as an appropriate update. The simple English and brief presentations of the principles in reaction mechanisms in organic chemistry, will continue to suit those preparing for competitive national examinations such as GATE, CSIR–UGC–NET, as it has done over the last 4 decades. Overall, this book accomplishes the challenging task of describing most fundamental aspects regarding reaction mechanisms in organic chemistry in a single book and is an excellent guide for an undergraduate student in this field.

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