

BOOK REVIEWS

professionals and amateurs alike. Under 'amateurs' I will include postgraduate students of sciences (e.g. biology and ecology, geography, environmental sciences), and of humanities as well. I am confident that postgraduate students pursuing humanities will find chapters 6 (Tribals and traditional knowledge resources), 9 (Degradation of environment and loss of biodiversity), and 10 (Conservation and management) useful. The book includes several helpful illustrations, some in colour. The line sketches are neat, which talk well.

Krishnamurthy *et al.* refer to the Borra Caves near Hyderabad. These stalagmite–stalactite caves are a fabulous gift of nature to us. Have we been able to embellish this natural gift in such a way that these caves could be both recreation and learning sites? I am not sure. Governmental and non-governmental agencies may immediately think of launching a revenue-generating development programme of the Borra and other similar sites. Development of natural environments needs to be understood, extrapolated and executed with utmost caution, so that both learners and tourists have the opportunity to enjoy such natural gifts realizing their objectives – either tourism or learning – and at the same time enabling such environments to maintain their original flavour and colour for posterity. Krishnamurthy *et al.* bring several such similar and unique endowments of the Eastern Ghats to light in this book.

In chapter 6 under subsection 7 (pp. 318–331), Krishnamurthy *et al.* talk of traditional agrobiodiversity, ethnomedical, ethnozoological, and ethnobotanical knowledge. The section that follows (pp. 331–340) refers to conservation measures of natural wealth by tribals, who are labelled by us as 'primitive', whose minds overflow with kindness, generosity and affability, compared with most of us, the so-called 'civilized' urbanites, in whom, generally, the above humane traits present only faintly.

In short, and in general, I am convinced that this book is a mine of rich information. The readable text includes reliable and relevant knowledge in the context of understanding and appreciating both biological and nonbiological materials (which the economists would call 'resources') of India in general and the Eastern Ghats in particular and making efforts to preserve them for future. The appendices, I am highly confident,

will be useful to any scientist interested in the physical and biological aspects of the magnificent Eastern Ghats of India.

At the UN Conference on Sustainable Development (Rio+20), Rio de Janeiro, Brazil, the people of Bolivia submitted a white paper 'Harmony with nature', which includes the following poignant words: 'Nature is not just a set of resources that can be exploited, modified, altered, privatized, commercialized and transformed without any consequences. Earth is the only home we have. The Earth does not belong to us; we belong to the Earth. The Earth is a living system. It is an indivisible, interdependent and interrelated community made of human beings, nature, the atmosphere, the hydrosphere, and the geosphere. Any substantive alteration of one of its components can affect other areas and the entire system. The Earth is the source of life. It is a system that coordinates physical, chemical, biological and ecological elements in a manner that makes life possible. Through the term *Mother Earth*, we express this relationship of belonging to a system and respect for our home'.

I find these words inspirational. The question is, 'are we correct in calling these natural endowments, some of which are to be "used" and not "exploited" by us, humans, as resources?'. Value addition to natural materials and 'branding' them as resources and treating them as critical for certain groups of *Homo sapiens* is not only unreasonable, but also unethical.

Aristotle's (384–322 BC) 'nature makes nothing incomplete and nothing in vain' (*Politics*), 'if one way is better than another, that what one is sure is nature's way' (*Nicomachean Ethics*), 'there is more both of beauty and of *raison d'être* in the works of nature than in those of art' (*de Partibus Animalium*) reverberated in me as I read through the pages of this book. With apologies to George Santayana, I take the liberty to ask ourselves, can we hear the music – played delicately yet brilliantly and charmingly – by the Earth? Do we have that level of sensitivity?

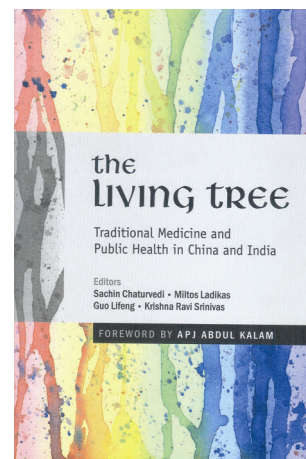
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The Living Tree: Traditional Medicine and Public Health in China and India. Sachin Chaturvedi, Miltos Ladikas, Guo Lifeng and Krishna Ravi Srinivas (eds). Academic Foundation, 4772-73/23, Bharat Ram Road, Daryaganj, New Delhi 110 002, 2014. 364 pp. Price: Rs 1195.

While the last few decades have witnessed substantial advances in modern medicine, there are many unmet needs. The costs of treatments are going beyond the reach of not only the poor, but also a majority of the global population. Many countries are facing challenges regarding accessibility, affordability and availability of medicine. As a result most people, especially in the developing world, continue to rely on knowledge of traditional medicine to treat illnesses and common diseases. There are serious concerns over research investments and the role of pharmaceutical industry in neglected diseases. The value of traditional medicine in providing affordable healthcare has been recognized by the World Health Organization. A study commissioned by the Commission on Intellectual Property and Public Health of the World Health Organization has indicated enough evidence for the use of traditional medicines

in meeting the health needs and benefits in terms of improving accessibility, availability and affordability, including the health benefit and cost benefit. At present, integrative partnerships between modern and traditional medicine are considered as a strategic approach to help bridge the equity gap in global public health. While this integration seems inevitable, the two systems are fundamentally different in epistemology and ethos. The culturally specific traditional knowledge tends to be freely accessible, while modern knowledge is fiercely guarded by intellectual property rights. Creating an integrative knowledge system has the challenge of the domination of developed world, especially over Asian knowledge bases largely represented by Indian and traditional Chinese medicine.

Both China and India have many cultural similarities and are facing similar challenges in the health sector. These challenges involve several issues such as socio-cultural, financial, economic impact, regulations, IPR, trade, industry, products, research, development and technology. These issues have direct impact on public health systems in the respective countries. Therefore, a critical situation analysis of their experiences and potential areas of collaborations for mutual and larger benefit becomes important. This need is being addressed in this book by providing scholarly contributions of experts from China, India, the UK, Germany, The Netherlands, Norway and Philippines. The book begins with a foreword by A. P. J. Abdul Kalam, an introductory chapter, followed by four sections comprising a total of 13 chapters.

In the introduction the authors correctly recognize that access to medicine is important and that international trade agreements have a significant impact. However, it remains unclear why they consider that a model like the Health Impact Fund (HIF) is appropriate for traditional medicines in India. In Section I, chapter 1, the authors have proposed HIF as one of the mechanisms that has been used globally to improve access and availability of medicines, and to foster innovation for essential medicines. The authors argue that the HIF might allow a status quo in such situations by bypassing them. However, discussion on whether the status quo itself is acceptable, would have added more value. How drugs will reach the target population (last mile problem), and garnering politi-

cal will to financially support an idea of the HIF will remain important. The authors appeal to the public health community and the Governments to support the HIF model as a pilot intervention.

The Indian and Chinese experts have suggested a regional variation of the HIF to focus on traditional medicine as China-India Traditional Health Impact Initiative (CITHII). The emphasis has been on the development of standardization and validation techniques, business models, and conservation and cultivation of medicinal plants. Therefore, the emphasis of CITHII appears to be more on the products than on systems and people. It seems rather market-oriented (the zeal for 'innovation' of the narrow sense) and not particularly taking into consideration the real potential of traditional systems for supporting public health in these countries.

Chapter 2 deals with a Delphi study, which was conducted to elicit thoughts on the HIF from an international group of experts. The findings have been shared transparently, and they are quite comprehensive. The authors have adequately addressed related issues justifying the need for such a fund. They rightly conclude that implementation of the HIF may not be possible unless policy makers, funders and industry can be convinced. Chapter 3 deals with health impact of new pharmaceutical products in the context of the HIF. It describes the issues related to current motivations in the pharmaceutical industry, which relate mainly to more profits and focus on the discovery of drugs for diseases of the rich. According to the authors, for the health impact of the new medicine might be an incentive for development of medicines for neglected diseases. Since the randomized controlled trials cannot be applied uniformly in different contexts, the authors have rightly emphasized the importance of observational studies to address this problem for practical and statistical reasons.

Chapter 4 illustrates the gender-based inequities in Chinese and Indian societies, and discusses the impact of these on health status and access to medicines. The authors identify barriers to access and urge the HIF to ensure gender fairness while implementing its projects. The authors rightly suggest gender-sensitive methodology for comprehensive evaluation of a pilot for assessing the burden and impact of drugs.

In Section II, chapter 5 provides useful information on the approaches and challenges in the application of intellectual property laws to traditional knowledge, particularly on traditional Chinese medicine. The Chinese experience has been discussed in detail, which has useful learnings for India. The Chinese laws have been made to encourage innovation in traditional Chinese medicine (TCM), but it is unclear to what extent they may have worked. The current Indian IPR and patent-related provisions are also discussed. The chapter concludes with a much needed reflection on the overall situation of traditional medicine in a globalizing world in context of standardization, validation and product development. Chapter 6 gives a good insight on the dynamics and trends in industry regarding production, distribution, trade and consumption of Indian traditional medicines, including Ayurveda, Siddha and Unani (ASU). The two main issues covered are proprietary and classical medicines and the way various companies and governmental bodies have handled these aspects. Important issues like misleading advertisements and availability of raw materials have been covered well. Authors raise an important question 'why few takers for standards?', and also provide analysis of why industry clusters are not taking-off despite substantial support from the Government. The authors rightly point out that the focus of the Indian industry is more on validation rather than innovation, and that they must take safety and quality control seriously.

Chapter 7 gives an excellent overview of regulatory guidelines in India. Various guidelines and specific requirements for safety assessment for four categories of herbal medicines are discussed. Key safety concerns include microbial, pesticide and heavy-metal contamination, efficacy, drug interactions and adverse reactions. The author has raised an important question about evidence of clinical efficacy. Regulatory provisions from other countries, including the US, the European Union and India are also well discussed. The need for meeting global requirements adopting all good practices like GAP, GCP, GLP, GMP has been correctly highlighted. The chapter also discusses the efforts of Indian national agencies like AYUSH, ICMR and CSIR, and recommends experience sharing between China and India. Chapter 8 gives

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extensive review and analysis of traditional medicine and IPR policies in India and China. Classical cases of turmeric and neem have been discussed by the author. The Indian response, including the initiation of traditional knowledge digital library (TKDL), sharing mechanisms between the benefiting community and seekers, and exploring legislations for process patents are also discussed. IPR protection system in India is discussed together with relevant regulatory provisions from the Biological Diversity Act, and Drugs and Cosmetic Act. The author concludes that the Government policy is to promote innovation and R&D by providing patent protection.

Chapter 9 provides valuable information on China–India cooperation on IP protection of traditional medicines. The authors suggest the need to develop new models and joint efforts to boost innovation and international standardization of traditional medicine. He recommends the need for integrating traditional medicine into global public health planning. Chapters 10 and 11 review industrial development of traditional drugs in China along with external trade and R&D of TCM. The author brings out an important point that progress in basic research has substantially contributed to R&D for new medicines. Various legislations and interventions that have been responsible for the growth of TCM are discussed. Further growth in the industry was possible due to timely reforms in standardization, strengthening IPR, and formulation and implementation of policies for low-income areas. Disease burden in China and results of investigation have been discussed with examples of hepatitis B. The overall focus of TCM has remained on creating a mainstream, standardized and internationally appealing products. The author has also offered key policy interventions for further development of TCM.

Chapter 12 focuses on issues related to conflicting situations between availability of affordable medicine and the IPR system. Issues related to generic drugs production, differential pricing, charity sponsorship and the need to encourage R&D in public sector are discussed in the context of traditional medicine. Examples of cooperation between private enterprise and Government in the Commonwealth countries are given, including the Eli Lilly multiple-drug resistance project. Some challenges in the proposed HIF model,

from the developing countries' perspective have been highlighted. Reforms in the international patent system have been suggested as emphasizing public health goals, simplification of the patent compulsory license procedure and reducing the patent period of global disease drugs. The need for establishing IPR protection system for traditional medicine with reassertion of community ownership of traditional knowledge has also been suggested.

Section IV includes the last chapter, which focuses more on China–India cooperation and the HIF. Lot of information from earlier chapters is repeated here. This chapter concludes with two recommendations. First, to develop a joint approach on standards and clinical trials, and the second is a more overarching need to develop joint approach on intellectual property. The authors advocate that China and India need to jointly work in the regulatory and IP-related areas that are essential to augment the use of traditional medicines.

The book is focused on access to medicines, issues of IPR, and innovation and application, addressing to some extent the issues of equity and social justice. It also touches upon aspects of health systems and public health priorities; however, the economists' influence seems to dominate public health and TM perspective. As a multi-authored book, it is understandable that the style and flavour of different chapters substantially vary. The perspectives of the authors towards the main issue also differ depending on their expertise or inclination to industry, public health or community. Therefore, many contradictions are seen among chapters. This in a way is good, as it raises issues from the point of view of different stakeholders. However, the editors should have tried to smoothen the edges in the concluding chapter.

This book can serve as a good reference for persons engaged in traditional medicine, public health, policy and analysis, for health professionals and health activists working on access to medicines, IPR, health systems, researchers and policy makers. While the book is a good addition to the scanty literature available on various issues that are common to Indian and Chinese traditional medicine sector, it has not brought out clearly what are the limiting factors and barriers in way of the spirit of collaboration between the two countries. Certainly, India has lot to learn from

China to bring more innovation, research and development of traditional medicine. India must also learn how scientific research and mainstreaming of TCM was systematically done in China.

India and China have many cultural similarities and the traditional medicine from the two systems also carries similar epistemology. While TCM is Yin and Yang, Ayurveda is Prakriti and Purusha. While geo-climatic variations are granted, many botanical raw materials are common in the two systems. In last two decades China has moved far ahead of India in terms of scientific research. According to SCImago country ranking data on Complementary and Alternative Medicine, China is in number one position with over 25,000 scientific papers compared to India which is ranked fourth with hardly 5000 papers. China has a success story like artemisinin, while India is still struggling with neem, turmeric or ashwagandha that are still far away from possible inclusion in mainstream healthcare.

Indian traditional medicine industry is in nascent state with limited resources. This industry is already facing severe challenges with raw materials supply and competition in global markets, especially from China. For instance, the possibility of Chinese chyanprash or triphala at half of the price in India cannot be ruled out in near future. These crucial aspects cannot be ignored when advocating bilateral cooperation between India and China.

The strategic cooperation is best built and sustained among equal partners. Creating joint collaborations with China without building sufficient levels of mutual trust among the stakeholders and without strengthening our capacity in research, technology, quality, production, marketing and strategic positioning, might put India in a vulnerable position and pose major risk in global markets and business. This book would have been further enriched if these crucial India-centric aspects were included. Nevertheless, the authors must be complimented for bringing out this unique volume that makes significant contribution to the debates on access to medicine and role of traditional medicine in public health.

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