



Transforming Indian Agriculture – INDIA 2040: Productivity, Markets and Institutions. Marco Ferroni (ed.). Sage Publications Private Limited, B1/1-1 Mohan Cooperative Industrial Area, Mathura Road, New Delhi 110 044, India. 2013, xxii + 357 pp. Price: Rs 995.

The book under review focuses more on economic than on ecological and social dimensions involved in sustainable agriculture. Agriculture in India has many challenges ahead as the country needs to tackle a number of issues such as uneven food distribution, changes in consumption pattern by people with many leaning towards higher value meat and dairy products, irrigation shortages, biodiversity loss, slowing down of productivity, growth and global change without accentuating environmental degradation and social inequalities. The proclamation ‘Today, India is no longer synonymous with crushing poverty, recurring famines and starving people’, is not true as the country still has a large number of malnourished and starving people. The Green Revolution certainly ushered in food security at the national level, but has not yet penetrated to the level of individual households, the paradox being, that mountains of food grains and millions of starving people still co-exist. As of today, India’s rank is dismal in terms of the United Nations Human Development Index, Global Hunger Index, etc. Further, the current social and food security schemes such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGREGA), and Food Security Act of the Government of India are not suitable indicators of the country’s growing affluence.

In chapter 1, Binswanger-Mkhize states that the urban–rural spill overs enhance the rapid growth of rural non-farming

sector. This could be true partially from the economic benefit for a few people, but from an ecological point of view, conversion and clearing of agricultural and forest land for industrial and urban development is unwise. The issue of increasing number of environmental refugees due to diversion of farmland for non-agricultural purposes has been well documented.

In chapter 2, Birtal *et al.* point out the contribution made by small farmers in producing high-value crops to be as high as 70% of the total vegetables produced, 55% of fruits and 49% of spices compared to 44% of the total land area they hold. They also produce 62% of rice, 52% of wheat, 54% of cereals and 69% of milk. This confirms that India’s food security rests on the shoulders of farmers with small holdings. In addition, resource-poor small and landless farming communities own and manage a major part of India’s total livestock. In 2002–2003, small farming communities accounted for nearly 74% of the country’s total cattle, 71% of buffaloes, 78% of small ruminants, 89% of pigs and 86% of poultry. However, the scale of production and productivity are poor largely due to lack of adequate technology and financial support. More studies should be carried out in this area. The presence of a large number of cattle accounts for emission of high levels of methane as the cattle feed is poor in protein and rich in cellulose.

Chapter 3 entitled ‘Improving water use efficiency: new directions for water management in India’ by Ackermann is well written and relevant to achieving sustainable agriculture. It provides a good review of India’s inefficient execution and lack of maintenance of several major and minor irrigation (MMI) projects with a view to promote conscious efforts towards improvement. It states that groundwater is a great equalizer as it does not discriminate against resource-poor farmers or selectively favour the rich and the influential, as might be the case of surface water irrigation systems. The sustainable management of groundwater in Gujarat is discussed as arguably the most successful experiment with its ‘Jyotigram Yojana’ Scheme. The scheme has simple yet effective steps to slowly alleviate the fiscal burden of unsustainable subsidies. The scheme involves separating feeders/power lines supplied to tube wells from those of domestic and non-farm users. As imple-

mented in Gujarat, tube wells get 8 h of full voltage electricity per day on a strict pre-announced schedule while non-farm connections receive 24 h/7 assured electricity supply. As a result of this, power supply to agriculture fell from 16 billion units in 2001 to 10 billion units in 2006. Groundwater draft was reduced by 20–30% and the Gujarat government subsidies have come down from USD 786 million in 2001–02 to USD 388 million in 2006–07. In addition, this chapter emphasizes on community regulation of groundwater abstraction, artificial recharge of groundwater through wells, etc. It also refers to the system of rice intensification that reduces the water requirement by about 32% and seeds by 85% while enhancing the yield by 40–80%. Watershed management is fundamentally a problem of social organization. Since 1990s, both the Government of India and numerous non-governmental organizations have funded projects around USD 500 million towards redeveloping watersheds in drought-prone areas, which have either fallen short of their goals or proved to be unsustainable. It was realized later that much was focused on the technical aspects of improving the watershed and little on navigating the complex social dynamics of the farming community. This chapter notes the efforts put in by the National Rainfed Area Authority to be vitiated due to the technical composition of the governing body. The authors also point out that the collusion of vested interests of the people involved like the contractors, engineers and politicians leads to building more dams and embankments, many of which are unnecessary and fail to serve any purpose. Endorsing the 11th Plan report, the challenges related to water management and irrigation are manageable and not insurmountable as it appears to be.

In chapter 4, Ferroni and Zhou review the agricultural extension in India, mentioning that it is at crossroads. However, the link between, research, extension and the farmer is absent. The authors refer to the National Seminar on Agriculture Extension held in New Delhi in February 2009, where the role of information and communication technology (ICT) and mass media extension had been discussed. It is to be pointed out that this event took place 17 years after the modern ICT-based Village Knowledge Centres (V KCs) were first set up in 1992 by the M.S. Swaminathan Research Foundation

(MSSRF), to provide locale and time-specific information and knowledge to help empower the resource-poor farming, landless and fishing communities in a few villages in Puducherry on the west coast of India. This innovation-based approach was the first of its kind to be initiated in the world and was based on an analysis which revealed that farmer-to-farmer contact was an important mode of obtaining necessary and timely information on seeds, pests, disease management, marketing, etc., especially in the absence of an effective agricultural extension service. The VRCs are in collaboration with the Indian Space Research Organisation and are provided with internet, GSM-based public address system, and satellite-based radio and video conferencing facilities. More recently, Fisher Friend Mobile Application (FFMA) is providing critical data related to timely information on potential zones for fishing, ocean state forecast, etc. with the intention of enhancing the fish catch and to forewarn the fisherman on cyclonic storms and other such natural disaster events. MSSRF's revised versions of FFMA in Android platform have included additional features such as GPS interface, disaster alerts and international boundary alerts to advise Indian fisherman against unknowingly straying into territorial waters of the neighbouring countries. However, the authors of this chapter do not mention the pioneering works done by MSSRF in empowering the many marginal farming and fishing communities. Since technology without specific goals and appropriate content serves no purpose, MSSRF has emphasized on content development to provide sound, relevant and timely advice to those who need the same. Further, MSSRF has used modern ICT to strengthen the links between the laboratories and the farmers.

The statement (p. 235 in the book) stating 'Agriculture has moved on, subsistence farming is at least aspirationally a memory of the past and high value products and processed goods are increasingly displacing the staple commodities of the old. Rising rural wages and rising farmer's demands for technology and services and private sector readily responds', needs a reality check.

This book underscores a corporate approach to the production of food preferred by the 'affluent' Indian population by 2040. This is also evident from the strong recommendation made for the

inclusion of genetically modified (GM) crops in Indian agriculture. At present, none of the GM crops grown around the world enhance the intrinsic yield of crops. Moreover, the pesticides used for GM crops (*Bt* and *Ht*) exert selection pressure leading to development of resistance in pests. It is also clouded by royalty issues. Above all, the adverse effects of GM crops to health and the environment are now clearly evident.

In conclusion, this book largely ignores the current social, environmental and economic realities of India and paints a rather illusionary picture of India turning to be an affluent country by 2040. The burgeoning population of India, degradation of the ecological foundations in agriculture, unsustainable lifestyle of the people and climate change suggest otherwise.

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Turn Left at Orion. Guy Consolmagno and Dan M. Davis. Cambridge University Press, The Edinburgh Building, Cambridge, CB2 8RU, UK. 2011. 256 pp. Price: US\$ 28.99, Euro 22.99.

You cannot judge a book by its cover, it is said; but sometimes, you can judge a book by its title. The intriguing title, which continues 'Hundreds of night sky objects to see in a home telescope – and how to find them' is one of the best-selling books in amateur astronomy and is so, for a good reason.

Guy Consolmagno explains in the introduction to the first edition (1989), reprinted in this edition as well, that after Dan Davis had introduced him to the fascinating subject of astronomy just before he, Guy, went to Africa, '...it occurred to me that all of the books in the world weren't as good as having a friend next to you to point out what to look for, and how to look for it. Unfortunately, I couldn't take Dan back to Africa with me'. He adds that many books tend to get technical with details of coordinates and that most stars are 'pretty boring to look at in a small telescope. You have to know where to look, to find the interesting double stars and variables, or the nebulae and clusters that are fun to see in a small telescope but invisible to the naked eye'. It is for the casual observers who want to enjoy the beauty of the night sky without the technical details, that Consolmagno and Davis decided to write this book.

To do this, the authors present some basic chapters on the telescope which are followed by chapters on the moon, the planets, the seasonal skies and finally, the northern and southern skies. The sections on the telescope are exceptionally well written; a small telescope, by the way, as they define it, is 2.4–4 inch main lens or mirror, or a Dobsonian with an aperture of 8–10 inch. The authors also state 'there are no bad telescopes. No matter how inexpensive or unimpressive your instrument is, it is almost certainly better than what Galileo had to work with'. Galileo used a telescope with a 1 inch aperture – and changed our thinking forever.

The moon is, of course, is a fascinating object, be it for astronomers, lovers or poets and it is the one object that can be seen even from our light-polluted and industrially polluted skies. This section follows, night after night, the various features that can be seen with the home telescope. Details of which direction to look in and what constellation the planet is in, are provided for Mercury, Venus, Mars, Jupiter, Saturn – up to 2024! Clearly, this book is going to remain useful to me and others for many more years to come.

The bulk of the book, of course, deals with stars, constellations and related objects. Each object is rated on how impressive it looks – in a small telescope, a Dob and a pair of binoculars, because each of these instruments will show the