

Journal of
Social and Administrative Sciences

www.kspjournals.org

Volume 3

June 2016

Issue 2

Parmod Kumar, Surender Kumar & Laxmi Joshi,
*Socio-economic and Environmental Indications of
Agricultural Residue Burning: A Case Study of
Punjab, India, Springer, 2015, 144 pp. \$59 Paperback*

By Mangesh V. NADKARNI †

Book Review

Normally, only large industries are blamed for causing significant environmental pollution. Agriculture, however, is no less responsible for pollution as well as depletion, on a scale more extensive than from industry. Fast agricultural growth in the Punjab was celebrated at one time as having contributed immensely to solving India's food problem, converting India from being a net importer to a net exporter of food grains. But the success came at a tremendous cost to environment, with a very adverse impact on agriculture itself, showing it as having had an unsustainable development.

The case of how the Punjab suffered from the environmental crisis and how it is raising its head again trying to achieve sustainable development of agriculture has been narrated in this very useful book, authored by Parmod Kumar, Surender Kumar and Laxmi Joshi. Though the title suggests that the main concern of the book is with only one of the unsustainable practices in Punjab agriculture – namely, the burning of agricultural residue, the actual scope of the study has been wider. It covers the whole story of unsustainable agriculture, its impact, and how the state has been (and should) fight back to making its development sustainable and environment-friendly. The title of the book should have been more suggestive of its broader scope, which would have done better justice to its subject matter. Admittedly, the story has a special and more detailed reference to the burning of rice straw in open fields, whose impact is the main focus of the book.

In the wake of the Green Revolution, the Punjab agriculture virtually became a rice-wheat monoculture. It made its farmers quite prosperous in the short-run. But the dream run did not continue at the same speed after some time. As the authors state, while agriculture grew at the rate of 5 per cent per annum during the 1980s, it was nearly halved to 2.6 per cent per annum during the 1990s. The yield of rice reached a plateau. The ground water was literally mined, being over-exploited. The study points out that the ratio of grossground water draft to net ground water availability was as high as 145 per cent! (p.3). This clearly indicated a very unsustainable water use. It meant both depletion and pollution, since it rendered vast stretches of precious lands saline, making them unproductive for cultivation.

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This situation of over-irrigation was a result of the policy of the state government itself, since it was supplying electricity free to farmers. There was no check on consumption of water even through pricing. The attractive support and procurement price regime induced the farmers to produce maximum output possible. The long run view of sustainability was sacrificed at the altar of short run profit maximisation. It is not just the farmers but the government also had become short-sighted and irrational. Everybody was absorbed totally in the exciting game of maximising short run output and incomes, and no body thought of what is to come tomorrow.

This is only a part of the sad story. The huge agricultural output also produced an even greater amount of residue in the form of straw. It was too huge to be converted into compost by traditional practices. The farmers, therefore, began burning most of the rice straw in open fields. The study is relatively silent about what the farmers did with wheat straw. But even the extensive burning of rice straw alone had its significantly adverse impact both on farm and off farm. It destroyed soil nutrients including the earthworms which used to nourish soils. It harmed bio-diversity, and also the health of both humans and animals through air pollution on farm as well as outside. It added to the country's carbon emissions, and 'contributed' to global warming. The study has given a systematic account of this impact.

The story, however, does not need to have a tragic ending. Even when man (or woman) commits serious mistakes, he (or she) also has the ingenuity to correct them, provided of course a long term and comprehensive or holistic view of the whole situation is taken into consideration. The study points out that the straw is of immense economic value and should not be treated as a mere 'waste'. Its value consists in being an animal feed, fuel, industrial raw material, and useful even for electricity generation. The straw can also be used in agriculture itself. An alternative technology of seeding has been developed with Australian collaboration. It consists in leaving the rice residue on the farm itself and drilling wheat seed directly in to them through 'Happy Seeders'. According to the authors, the Happy Seeder Technology can be useful in large tracts of the Indo-Gangetic Plains of India wherever the rice-wheat production regime prevails. Apart from reducing carbon emissions and Global Warming, the technology can also improve soil health, and achieve reduction in water and electricity use. It can also help in regenerating bio-diversity.

The book is systematically structured with seven well informed and well written chapters. Apart from explaining the objectives and methodology, the chapters present the complex issues of residue management (hitherto a relatively neglected problem), health and other effects of such management, sustainable alternatives to present ways of managing, and the state's environmental policy. It is encouraging that though the state government in the past was as short-sighted as the farmers, it has woken up to the dangers of the past unsustainable practices and policies, and intends to turn a new leaf. Let us hope that the state will learn from the past mistakes and lead the country now on the path of sustainable agricultural development.

The authors deserve to be complimented on producing an immensely useful study, which has clarity as well as depth. It is relevant not only for Punjab agriculture, but also in other regions so that all can avoid unsustainable practices and adopt a holistic and long term view of both agricultural and overall development.



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