RESEARCH ARTICLE

Agricultural Science in Colonial India: An Introductory Note

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This special In Focus section of the *Review of Agrarian Studies* deals with three relatively understudied aspects of the development of agricultural science in colonial India.

The first is the development of agricultural science as part of the history of science in the colonial period. Apart from the account of the growth of agricultural science in the colonial era in Deepak Kumar's pioneering *Science and the Raj* (2013), there are few studies on the subject.[1] A broad chronological account is available in the work of Randhawa (1983), now the standard reference in this regard.[2] The studies that focus on the formation of the scientific community in the agricultural sciences are far fewer than those done on the formation of the scientific community in the physical and chemical sciences.[3] A similar neglect marks the study of engineering, though the work of Ramnath (2013) goes some way towards addressing this lacuna. Many of the pioneering figures of agricultural science research remain unknown, other than through biographical sketches from science academies and occasional biographical references in similar literature.[4] This gap is all the more surprising when we consider the significance of agricultural science for India. The development of agricultural science was the first step in India's transition in the 1960s from a country with a chronic deficit in food production to overall self-sufficiency. The absence of studies of this early history of agricultural science is particularly noticeable when we consider the significant body of work focused on

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[1] For a review of the available literature, see Roy (2010), and Baksi (2013).

[2] M. S. Randhawa's four volume work on the history of agriculture in India is of course an indispensable starting point for any study of the history of agriculture in India.

[3] See, for instance, Jairath (1984), Krishna (1991), and Kumar (2006) for discussions of the formation of the scientific community in physics and chemistry, and some references to biology and related issues.

[4] A good example of this is Swaminathan (1988) on the work of K. Ramaiah, a pioneer in the development of rice production.

India's national agricultural research system in the Green Revolution period and thereafter.

To labour the point: the mainstream history of science tends to be dominated by the natural sciences such as physics and chemistry. In the relationship between the history of science and other branches of the study of science, such as the philosophy or sociology of science, agriculture is noticeably missing.[5] This gap is particularly evident (and problematic) in societies where agriculture continues to play a major role in the life and livelihoods of a majority of the population.

The second aspect of the development of agricultural science considered in this In Focus section is the extent of penetration of modern techniques of agricultural production in the colonial era, the role of the dissemination of the knowledge derived from modern agricultural science, and the adoption of such knowledge in practice. While the history of early industrialisation in India is relatively well-studied, a similar account of the development of the productive forces in agriculture is lacking. A reason for this gap is the widely accepted reading that agricultural production and productivity in colonial India were characterised by long-term stagnation.[6]

While it is clear that British rule was not a period of agricultural growth, it must be recognised that Indian agriculture witnessed the widespread introduction of new crops, and new surpluses from sectors of agricultural production during this period. The introduction of new varieties and new techniques of production, including modern inputs such as fertilizers and improved implements, was initiated by the colonial rulers, especially in the aftermath of the famine of 1876 and the subsequent indictment of the colonial government in the report of the Famine Commission. The role of the colonial administration in the promotion of agricultural science and modern techniques in agriculture, and the relationship between the two is worthy of detailed study. The relatively low impact that such promotion had on the growth of agricultural production in general does not take away from the importance of the study of modernisation of agriculture. On the other hand, it highlights the significance of the backwardness of agrarian relations as a fetter on the development of the productive capacities of Indian agriculture.

The study of changes in the productive forces in agriculture is particularly relevant in the context of readings of science in colonial India as being an imposition on a resistant majority, of a mode of doing and thinking "alien" to Indian society and culture

[5] The development of new technologies in agriculture such as transgenic crops and the relevance of agriculture in the context of contemporary debates on environmental sustainability have, of course, contributed to a renewed interest in the significance of agriculture science as one of the modes of the understanding and interaction of human society with nature.

[6] The classic reference in this regard is Blyn (1966). For a very brief critique of attempts at "revisionist" rewriting of this account, see Bagchi (2015). A more even-handed account of the productivity debate can be found in Yanagisawa (1997).

(unwitting "epistemological" violence, as it is described in the more extreme readings) with the active collaboration of a "Westernised" elite.[7]

The third aspect of the development of agricultural science considered in this feature are the perceptions of different sections of society, especially the intellectual stratum, of the relationship between the modernisation of agriculture, particularly the application of modern agricultural scientific knowledge, and the socio-economic context of agricultural production. Today, nearly 70 years after India became independent; a thoroughgoing agrarian transformation – of the redistribution of land as well as the abolition of pre-capitalist social relations – has not taken place except on a limited scale. On the other hand, the thrust of the agricultural policy of the State has been to utilise science and technology to enhance agricultural production even while socio-economic institutions in the countryside have not seen radical transformation. It is a particular feature of Indian society that a policy that distinctly eschews any attempts at radical socio-economic transformation commands something of an intellectual consensus. The opposite view, that the absence of such a transformation is what holds back the development of agricultural production is certainly in a minority among intellectual currents in this country. Another line of argument holds that the contemporary crisis of the small and marginal farmers in India lies in the very nature of the modern scientific and technological practices promoted by the State after Independence and their inherent economic and ecological unsustainability.[8]

That the mainstream of the Indian freedom movement eschewed any radical agenda of socio-economic transformation of the countryside is well-known (see, for instance, Namboodiripad 1993 and Dutt 1949). But whether the post-Independence strategy in agriculture, especially the counter-posing of radical social transformation to the technological improvement of agricultural production had antecedent roots in the intellectual ferment of the freedom struggle is a matter of more than passing interest.[9]

Much of the literature on science and technology in the colonial era is based on sources in the English language, whether by colonial administrators or by Indians themselves. However, the study of the larger impact of science on Indian society, beyond its instrumental aspects, which served the demands of colonial rule, clearly needs to draw from the material available in Indian languages. The character of agricultural production, its peculiarities as well as the specific characteristics of its social and

[7] The tendency to deny the underlying universality of science and to over-emphasise the specific social and cultural differences between various traditions of scientific enquiry across the world is widespread and there is a vast literature that articulates this viewpoint. For a classic collection of essays of this genre, with particular reference to India, all of which echo the relativist refrain of science in India as a "Western" imposition, see Nandy (1988). For an overall introduction to some of the issues, see, for instance, Mazzocchi (2006), and for a useful survey and critique of such viewpoints, see Baber (1996) (especially the introduction and the last chapter).

[8] See, for example, Raina (2009) and Shiva (2015). For an earlier critique on similar lines, see also Shiva (1989).

[9] In this connection, Bipasha Raha's study (Raha 2013) of the views of Bengal literati on questions of land and agriculture is a pioneering one.

economic institutions, are well known to depend on local, social, political, and cultural variations. In this sense too, the use of Indian language sources must undoubtedly be an integral part of a more complete and deeper analysis of the development of agricultural science and its consequences for Indian agriculture.

The papers in this issue's special focus theme focus on the debate on the modernisation of agricultural science in three different regions of India. Each of these papers also explores a different theme in the context of the development of agricultural science under colonial rule.

One dimension of the colonial administration's promotion of modern techniques in agriculture was the dissemination of technical knowledge through publications in the vernacular. The paper by Baksi and Kamble examines this effort in some detail in the Marathi publication *Shetki aani Shetkari*, the journal of the Deccan Agricultural Association. The journal and the Association both received the active support of the colonial administration. It is evident from the contributions to the journal and the specific aspects of agricultural production that these contributions dealt with, that the agricultural arm of the colonial administration had considerable awareness of the technological and scientific aspects of Indian agriculture. The specificity of the issues that the journal dealt with demonstrates the detailed knowledge of the conditions of agricultural production that officials and the scientific personnel of the colonial administration had. At the same time, the editors of the journal were clearly of the view that the development of productive capacity was the key to solving the problems of Indian agriculture. It is important to note that it was not just colonial administrators who had a knowledge of science. Most of the articles promoting science were by Indian academics/intellectuals. This is most significant, as was the interest with which readers received the journal.

The journal's editorial stance, articulated early on, asserted as much, and pointedly refrained from enquiring into the role of economic and social institutions in any way, both in the larger sense of social transformation or even in the limited sense of obstructing the growth of productive capacity. Agricultural science, understood thus, was clearly a colonial product. Yet it would be simplistic and incorrect, as Baksi and Kamble's account shows, to portray it, as many contemporary accounts have tended to do, as an "alien" understanding of agriculture, which sought to impose itself on a pre-existing system of production, without regard to the specific conditions prevailing in India. Indeed, the very attempt to vernacularise, as it were, scientific knowledge, militates against such simplistic readings.

In a second essay, Arnab Roy traces explicitly the evolution of a "productionist" discourse in the writings of the Bengal literati on agriculture, writings especially in Bangla, that tended to marginalise any discussion of the socio-economic origins of the stagnation in agriculture in Bengal. This is in marked contrast to the Hindi language literature on agriculture, which, as the third paper will demonstrate,

perceived the tension between the two. A turn in the Bengali literature to a more radical view of the socio-economic conditions of agricultural production occurred at a later period.

In the third paper, Baksi discusses the perceptions of the newly emerging Hindi literati on the crisis of agricultural production in the United Provinces under colonial rule. His paper, in particular, focuses on agriculture in the pages of the journal *Saraswati*, the pre-eminent vehicle for the articulation of the world-view (or world-views, more accurately) of this emergent social stratum. While the journal devoted considerable attention to matters relating to science, technology, and production, particularly their popularisation in the Hindi language, it also self-consciously located this discussion within its perceived role as a platform for the articulation of a view of nationalism. This view saw the spread of Hindi and Hindi literature as the foundation for an Indian national identity. In contrast to the colonial administration's emphasis on production to the exclusion of the social and economic aspects, the attention of the writers in *Saraswati* is drawn precisely to these. Their attention to the more technical and scientific aspects of production and productivity emerged later. Over time, the specificity of the discussions of an earlier period were diluted, and turned to discussion of a more diffuse notion of rural or village development (gram-sudhar).

Taken together, the three papers provide a fresh point of entry, from the perspective of history, into the study of India's most important challenge, the agrarian question. That the failure to deal with this challenge in a thoroughgoing way in independent India has important antecedents and roots in the intellectual history of the colonial era, especially in relation to the science of agriculture, is the point that these contributions begin to fruitfully explore.

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