Buchbesprechung / Book review

Subramanian, Arjunan (2007): **Distributional Effects of Agricultural Biotechnology in a Village Economy: The Case of Cotton in India.**

Cuvillier Verlag, Hohenheim, Göttingen; 183 S., engl.;
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The book – a doctoral dissertation organized in five chapters – deals with the very topical issue of the role and impact of agricultural biotechnology in developing countries, using an in-depth case study of a village in Maharashtra, India. The contribution of this study is the construction of a social accounting matrix based on a full census survey of all households in the village. Subramanian argues that indirect benefits such as changes in employment and wages and other spill-over effects are significant but often overlooked when assessing new technologies. In his thesis, he thus aims at quantifying both direct and indirect effects of insect-resistant (Bt) cotton – a very ambitious and innovative goal.

The introduction summarizes the benefits of the Green Revolution but stresses that it has largely by-passed the semi-arid tropics. The author is convinced, however, that agricultural biotechnology – the Gene Revolution – will deliver significant benefits to the poor. Chapter Two comprises a review of the status of genetically modified crops globally and insect resistant (Bt) cotton and maize as well as herbicide tolerant (HT) soybean in particular. Subramanian is somewhat selective in the choice of studies included in his review and ignores the sometimes valid arguments put forward by (local) NGOs and published in reports or national journals.

After a concise general introduction to the method of social accounting matrices (SAM), Chapter Three provides an in-depth account of survey findings and methods of incorporating different aspects of the village economy (e.g. production, commodities, institutions and capital) in the SAM. While the amount of information the author has collected during the census survey is certainly impressive, one wonders if the reader really needs to be exposed to this level of detail (e.g. number of households using condoms and monetary fines for stray cattle). At the same time, some methodological aspects such as accounting for storage losses, and value increase in livestock through growth/aging, up-scaling of the consumption survey to a full year, and the protocol for surveying family members other than the household head would have benefitted from a more detailed description. In addition, there are certainly questions around the selected system boundary (i.e. survey restricted to the village level) given that a large share of interactions takes place between respondents and "outsiders".

Chapter Four presents the analytical part of the thesis, the application of a multiplier model to simulate economy-wide effects of Bt technology adoption. The SAM analytical framework is well-explained and straightforward albeit not particularly innovative and restricted by some necessary assumptions. Subsequently, two experiments in the style of a scenario analysis are conducted to assess the impact of increased demand for Bt cotton. While the methodology is plausible and carefully implemented, the fact that only 3% of the village cotton area is planted with Bt cotton – cultivated mainly by large-scale farmers in their first year of adoption - in my opinion severely limits the scope for generalizing the findings. Most surprisingly, Bt adopters use exorbitantly higher amounts of chemical pesticides than farmers growing conventional varieties – and thus have increased demands for labor. Despite this empirical finding and all the effort that went into the collection of his primary data set, Subramanian reverts to previous studies of other researchers and assumes large reductions in pesticide applications and thus lower labor input under Bt cotton for his experiments. The reason for the much higher usage of chemical pesticides in the insect-resistant Bt crop remains unexplored, but might partly be due to the fact that Bt cotton is predominantly grown on irrigated plots and produced with a much higher input intensity in general. If this was the case, it further complicates the attribution of observed yield differences to the varietal change.

Chapter Five tackles the very interesting question of why farmers sell their cotton to a trader who offers a below average price for the produce. Different

hypotheses involving factors such as kinship networks and neighborhood effects are carefully examined and tested to explain this seemingly irrational behavior. While the explanation given (i.e. priority access to subsidized goods) is compelling, I kept wondering why no related question was included in the survey to further investigate this issue? The author's own major interest seems to be in the field of trader-idiosyncracy – yet this fascinating topic occupies only very limited space in the book and seems poorly connected to the rest of the analyses.

The ideas to include both direct and indirect effects of Bt cotton in the assessment is innovative and important. The conclusions of the study, however, are general in nature and mainly not based on the results and findings of the actual research, but rather a reflection of the author´s sense of the wider literature. While Subramanian collected a huge amount of information and clearly spent large efforts to balance the SAM, the study in my view does not add to the debate about whether or under what circumstances agricultural biotechnology will benefit the poor. The data set and methodology, however, are well suited to unravel seemingly irrational behavior of actors in (local) markets.

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