



## BOOK REVIEW

### **Economic impact of innovative biotechnology at the village level: The case of insect-resistant cotton in India**

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This is the review of the book titled “*Distributional Effects of Agricultural Biotechnology in a Village Economy: The Case of Cotton in India*” written by Dr. Arjunan Subramanian and published by Cuvillier Verlag Goettingen in 2007.

Dr. Arjunan Subramanian is my teacher on the construction of SAM (Social Accounting Matrix) at the village level. He was a pioneer in the construction of SAM by conducting census. Before his work, scholars used secondary data to construct the SAM. The book of Taylor and Adelman (1996) was very famous in this field. In the book, there were many SAMs that were created by using secondary data, for example, Irma Adelman, J. Edward Taylor and Stephen Vogel (1988) in Mexico which was the first Village-SAM of the world, Shankar Subramanian in India, Blane D. Lewis and Erik Thorbecke in Kenya, Elise H. Golan in Senegal and Katherine Ralston in Indonesia. Works of Shankar Subramanian and Elisabeth Sadoulet (1990), Stephan Klasen (1990), Alka Parikh and Erik Thorbecke (1996) and Marijke Kuiper (2005) also used secondary data to construct the SAMs.

It was the first time in the world that Dr. Arjunan Subramanian conducted the census to construct the SAMs in Kanzara village in the state of Maharashtra in India. He used the 120-page questionnaire to collect the data house by house and every house that he could find in the village. I got the questionnaire from him and adapted it to be suitable for the data collection in the Thai economy. I can say that doing the census with more than hundred pages of the questionnaire is a hard job and absolutely time consuming. Dr. Subramanian mentioned in his book about these difficulties of the survey and he felt grateful to the villagers that cooperated so well. His devotion made him alike a village member during his stay in Kanzara.

His work was on the economic impact analysis of a transgenic crop technology which is the insect-resistant Bt cotton. In his SAM table, he includes both conventional and transgenic

cottons in the same account. He applied the micro-SAM multiplier model to investigate the impacts to the village economy.

The simulation in the study begins with an exogenous increase in cotton demand or the export demand. In the first simulation, the demand increases for the conventional cotton and in the second simulation, it increases for the innovative cotton. He also separates two simulations for dry cotton production and two more simulations for wet cotton production. The increasing demand raises the incomes of domestic production activities. Then, it adds income to households. Repeatedly, households buy more from production activities and generate more income to them. Other two sources of income is the factor income and non-factor income that the village receive from outsiders in other forms.

The author concerned of the limitation of the SAM Multiplier model and took note that it is the fixed price model with the assumption of perfectly elastic supply and fixed proportion of the utilization of inputs or intermediate goods for the production.

The results show that the increasing demand for the innovative cotton raises more total value added than that of the conventional cotton. This phenomenon appears in both the production of dry and wet cottons. For dry cotton, the innovative cotton raises around 17 percent more of the value added than the conventional one. The number is around 11 percent for the wet cotton production.

For the income distribution, the innovative cotton may benefit large farmers than other groups of farmers in both dry and wet cotton productions. Medium farmers clearly benefit more from conventional cotton in terms of the income change. Small farmers slightly benefit more from the innovative cotton. All other landless workers, with or without salary and work in agricultural or non-agricultural sector, tend to benefit more from the conventional cotton than the innovative one.

For these results, Dr. Subramanian mentioned that the innovative cotton raised more income to everyone. It also raised total employment. However, for the uneven distribution of the benefit, it might be because of the reduction of employment in pest control that was a major source of income for small and medium farmers and landless workers.

Overall, there are at least three distinguished merits of this work of Dr. Arjunan Subramanian. First, the study shows a great effort in the data collection from the census to construct the Social Accounting Matrix and it is a very good example for other works that try to follow suits. Second, it raises the issue of innovative biotechnology to be concerned for its economic impact. The works combining innovation and economics are rare and this work is a very good one. Third, it evaluates the impact at the village level. This is at the heart of the development. The benefits of the development must go to people. An investigation of the impact at the village level touches people at the grass roots of the economy. When villagers benefit from the development of the innovation, then it can really be said that the innovation is successful.

## REFERENCES

- Adelman, Irma, J. Edward Taylor and Stephen Vogel. 1988. Life in a Mexican Village. **Journal of Development Studies** 25, pp. 5 -24.
- Klasen, Stephan. 1990. **Analyzing Traditional Agriculture in Bolivia: A Village-Based Computable General Equilibrium Model**. A Senior Honors Thesis Submitted to the Department of Economics at Harvard University.
- Kuiper, Marijke. 2005. Village Modeling: A Chinese Recipe for Blending General Equilibrium and Household Modeling. Ph.D. Thesis, University of Wageningen, the Netherlands.
- Parikh, Alka and Erik Thorbecke. 1996. Impact of Rural Industrialization on Village Life and Economy: A Social Accounting Matrix Approach, **Economic Development and Cultural Change** 44, 2: pp. 351-377.
- Subramanian, Arjunan. 2007. **Distributional Effects of Agricultural Biotechnology in a Village Economy: The Case of Cotton in India**. Goettingen: Cuvillier.
- Subramanian, Shankar. 1996. Production and distribution in a dry-land village economy. In J. Edward Taylor and Irma Adelman. **Village Economies: The Design, Estimation, and Use of Villagewide Economic Models**. Cambridge: Cambridge University Press.
- Subramanian, Shankar and Elisabeth Sadoulet. 1990. The transmission of production fluctuations and technical change in a village economy: a social accounting matrix approach. **Economic Development and Cultural Change** 39, 1: pp. 131-173.
- Taylor, J. Edward and Irma Adelman. 1996. **Village Economies: The Design, Estimation, and Use of Villagewide Economic Models**. Cambridge: Cambridge University Press.