

## BOOK REVIEW

*Technology and Agricultural Development in Pre-War Japan* by Penelope Francks, New Haven and London, Yale University Press, 1984, xiii+322 pp.

### I

While the importance of developing agriculture, instead of unsuccessful industrialization, in the economic development of a developing country has come to be seen in a fresh light, the introduction of modern technology to traditional farming is a question awaiting solution. And this seems to depend much on how the relationship between agricultural development and technology could be analyzed in a way fully warranted by economics. Hence the problem of what are "appropriate techniques" for agricultural development.

As far as the macroeconomic question of the agricultural development of a country as a whole is concerned, to be sure, the extent of the "factor bias" may largely determine the framework and the direction in which the choice of a technique is made, as is assumed by the Hayami-Ruttan hypothesis.<sup>1</sup> However, the choice of an "appropriate technique" at a particular time and at a particular place should be made under the influence of a number of parochial and time factors. Particularly important are the subjective conditions of a farmer who makes the choice. And this seems to be the reason why the author, who made an intensive study of "dynamic sequences" of systematic technical innovations in farming in prewar Japan, focusing the introduction of mechanized irrigation pumps in the Saga Plain, Kyūshū, as a whole in the 1920s, had this to say: "The purpose of this book has been to describe the economic workings of a rural community—the agricultural technology it used, the way it organized the production and distribution of output, and the forces conditioning changes in these things" (p. 278).

### II

This book consists of nine chapters. In Chapter 1 the author, with her cognition of the questions indicated above, examines various works concerning agricultural development and technical innovations, through which she sets the problems to be analyzed. Chapter 2 introduces to the reader general outlines of the nature of the economy and society of Japan in relation to agricultural development. Chapter 3 summarizes the economic history from the Meiji Restoration in 1868 through the 1930s. The author divides these years into Phase 1 and Phase 2, with 1900 as the border-line. The first period is accredited with the development and extension of *Meiji nōhō* (Meiji agricultural methods), where an active growth of agriculture took place side by side with that of industry; in the second, on the other hand, the growth of industry is explained to have by far outpaced agriculture, resulting in the steadily declining relative position of agriculture.

<sup>1</sup> Y. Hayami and V. Ruttan, *Agricultural Development: An International Perspective* (Baltimore: Johns Hopkins University Press, 1971).

The main part of this book, from Chapter 4 to Chapter 8, is devoted to detailed analyses of the agriculture of Saga Plain. First, the technical and economic structures of the farming community in the Saga Plain in the mid-nineteenth century on the eve of the early technical innovation, with their rather stagnant, traditional characteristics, are brought into relief (Chapter 4); then are given meticulously detailed accounts of the trial-and-error attempts for many years to overcome stagnancy, the efforts at various levels, i.e., on the part of the administrative authorities, the agricultural experiment stations (whose staff members served not only as researchers but as unofficial extension workers) and various such intermediate organizations as the irrigation associations, village organizations, etc. (Chapter 5). Based on the historical analyses of the Saga Plain agriculture in the pre-technical-innovations period described in chapters 4 and 5, the powerful impact of the military-oriented heavy industrialization of Northern Kyūshū on Saga agriculture in and after 1900 is discussed as one of the special provincial characteristics of the relationship between agriculture and industry (Chapter 6). How was this impact met by the Saga Plain agriculture? This is a central theme of Chapter 7, and also of this book as a whole. The descriptions in chapters 4 and 5 then are not merely a prelude to this main theme; it may rather be said that they are intended to present the history of the formation of those who played active roles in innovation in agriculture. Chapter 8 is devoted to appraisals of what was attained on the whole at the "Saga Stage" which was the culmination of the dynamic sequences of innovations and was so called to denote it as the most advanced state of the agricultural development in Japan before World War II.<sup>2</sup> In the final Chapter 9 are set forth general conclusions that the author as a development economist drew from her most original study.

### III

This book thus closely traces the process of development of the prewar Japanese agriculture with special reference to the Saga Plain agriculture while also paying attention to the economic history of this country. The region of the author's concern then may be broadly divided into three, and much of her effort is directed to clarifying the relationships between them.

The first is the impact of industrialization. Analyses are made of how it brought about changes in the factor supplies on the macroeconomic level. The development of heavy industries in Northern Kyūshū absorbed as their labor force those small-scale cultivators/agricultural laborers who had formed the bottom strata of the farmers of the Saga Plain agriculture, critically affecting farm management on the part of the large employers-cultivators who had depended on such labor force. Industrialization, at the same time, produced a great demand for low-price rice as a result of a big urban concentration of industrial workers. This fact so operated as to increase the number of the medium-scale owner/tenant farmers operating on the basis of family labor, who tried to take advantage of the newly created market. What conditioned the formation of the medium-scale farmers as the dominant force in agriculture in that region was the all-out superceding of the traditional pedal-driven man-powered

<sup>2</sup> T. Isobe, "Iwayuru Saga dankai no keisei katei" [The process of formation of the so-called Saga Stage], in *Shuyō chitai nōgyō seisanryoku keiseishi* [History of agricultural productivity formation in various regions] ed. Nōgyō hattatsushi chōsa kai, Vol. II (Tokyo: Chuokoron-sha, 1959).

water wheels by the mechanized irrigation pumps. In other words, the subject here is to analyze the process of a series of changes in macroeconomic factors: the progress of industrialization → the outflow of the labor force from agricultural villages → the shortage in the labor force for irrigation → the introduction of labor-saving techniques → the formation of the medium-scale owner/tenant farmers to use the techniques.

The second is the role of the village-level organizations of farmers which the author analyzes, taking the above changes as those in the inner structure of the Saga agriculture. That is an analysis of the subjective conditions of technical innovations determined by microeconomic factors such as the traditional institutions and the social environmental conditions. In the case of paddy farming in Japan, the village-level organizations of farmers basically operated to establish and maintain the land utilization and management order, centering around the irrigation investments accumulated in the course of many years. The author strongly supports the Ishikawa hypothesis<sup>3</sup> which emphasizes the importance of evaluating the presence or the lack of this order, its strength or weakness.

Having analyzed the impact of industrialization on agriculture in the first place, and the inner structure of the strata of farmers as the initial technical innovators on the village level in the second, the author tries to harness these analyses to her third region of concern—the analysis of the roles played by the prefectural administrative authorities, the agricultural experiment stations, the irrigation associations covering wide areas, and the local machine manufacturers. Emphasis is placed on the roles of these intermediate organizations, instrumental for putting the innovations into effect, and how their ability to make a choice of appropriate techniques was acquired through many years of trial-and-error efforts based on close contacts with farmers. Thus, as the author summarizes, “although the induced innovation hypothesis, based on changes in relative factor supplies, is a useful starting point in analysing the process of technical change in Saga, it is by no means the end of the story, and Saga’s success in developing and diffusing appropriate new techniques depended crucially on the selection of a wide range of technical characteristics besides factor bias, suited to the particular conditions of the place and time” (p. 286).

#### IV

The main themes discussed by the author then may be narrowed down to the following three:

(1) *The endogenous character of development.* With regard to the theme of the choice of appropriate techniques relative to agricultural development, their evolutionary process can indeed be shown as a spiralling, endogenous accumulation process of various trials and attainments. This character of development should be understood to cover not only the agricultural structure but the growth of the various levels of intermediate organizations, including also that of local industry. The “appropriate techniques” here are already not those brought in from the outside alone.

(2) *The local organizations as a determinant of development.* While the traditional village community organizations proved useful in development of the Saga agriculture, the strata of farmers as their primary members changed greatly. The newly grown medium-scale owner/tenant farmers became beneficiaries of the technical

<sup>3</sup> S. Ishikawa, “Technological Change in Agricultural Production and Its Impact on Agrarian Structure,” *Keizai kenkyū*, Vol. 22, No. 2 (April 1971).

innovations. Their growth so operated as to revive and strengthen, rather than to disrupt, the traditional village organizations so that they became ones of mutual help, of homogeneity and based more on equality.

(3) *The growth of individual farms based on greater collectivity.* The development of the Saga Plain agriculture, after the introduction on a collective basis of mechanized irrigation pumps as a "labor-saving technique," was only possible through a continually cumulative formation of new, considerably *labor-intensive* technique on the part of individual farmers. And this process, i.e., "dynamic sequences," was one in which the medium-scale owner/tenant farmers grew to become the dominant force in the village communities.

There is a considerable mass of official and private documents relating to and analytical studies on the Saga agriculture of both the prewar and postwar years. Written in Japanese as they are, the author read them carefully to work out a logical system suited to her cognition of the problems concerned. Outstanding in this book is the author's stance that the criterion of what is an "appropriate" technique should be viewed from a long-term structural standpoint, and that the conclusions drawn from her study may not immediately be applicable as lessons or as a model for developing countries today.

(Toshihiko Isobe)