FARM RESOURCE-ALLOCATION AND EFFICIENCY IN THREE REGIONS OF EAST JAVA, INDONESIA

A Thesis Submitted for the Degree of Doctor of Philosophy of the University of New England

by

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ABSTRACT

The investigation reported in this thesis is placed within the context of the development objectives of Indonesia with emphasis placed on improving rice production. Evidence is provided to support the view that too much of the development effort to date has been concentrated on improving rice yield and that problems of a slow increase in agricultural production and inefficient farming still exists. Little attention has been paid to studying these problems.

The main purpose of the thesis is to determine the factors which contribute to the 'levelling off' in the rate of increase of yield and the factors affecting farm-resource allocation and efficiency, and farm profits.

A survey of the relevant literaure is made. Models for assessing farm efficiency are discussed and the models used for assessing farm efficiency and farm profits are justified. Partial productivity analyses, the Cobb-Douglas production function, the Cobb-Douglas frontier production function, the Cobb-Douglas unit-output-price profit function and factor analysis were used in the study.

The data used in the study were farm level data collected for the Rural Dynamics Study, Agro Economic Survey, East Java on which the author worked. They were collected from three villages in 1978.

Analysis of the results of the partial productivity measures showed that a yield gap between the actual and the potential yield at the farm level existed. The yield gap, particularly for rice, was about 31 per cent and it was rather less on the 'large' farms. Higher yields were found in Regions 1 and 2 which had relatively better agricultural environments, such as irrigation and good extension services. The yields achieved by sharecroppers and owners did not differ statistically. Further, on the basis of an intepretation of the results of the factor analysis, it was found that better agricultural

information is an important variable in relation to the technical efficiency of farming. Thus improved agricultural information and access to it may be an effective means of obtaining greater efficiency.

On the basis of an interpretation of the production function analyses, the input variables, land, labour and current expenses, all play an important role in the variation of rice output. This finding supports that suggested in the literature, that 'small-area' crops are characterized by high production elasticities for land and small land-to-labour ratios.

The technical efficiency of the farms was analysed using the Cobb-Douglas frontier production function based on linear programming procedures. This analysis enabled productivity estimates at the individual farm level. It was found that the mean per cent technical efficiency rating of the sample farms was 67 per cent and the mean per cent economic efficiency rating was 37 per cent. However, there was a positive relationship between technical efficiency rating and economic rating which indicated that both technical and economic efficiencies have a significant effect on the gross revenue from rice. The greater the technical and economic efficiencies, the greater the gross revenue from the rice.

The gains from achieving efficiency in rice production, and the distribution of profits of the sample farms have been analysed. It was found that rice-farm profits per hectare were 143 and 158 thousand rupiahs in the wet and dry seasons, respectively. However, the distribution of profits was markedly unequal as indicated by the Gini coefficients which were 0.465 and 0.348 in the wet and dry seasons, respectively. Implicitly, this finding supports the view that increases in productivity increase farm income but at the same time widen the inequality of the income distribution. In conjuction with this conclusion, it was indicated that the distributions of total farm area and technical and economic efficiency ratings were a significant determinant of the distributions of profits.

On the basis of an interpretation of the results of the profit function analyses, it was found that the output supply of rice was elastic with respect to the price of output; the own-price elasticities of demand for the factors of production were all above unity; and the cross-price elasticities were relatively small for all the inputs, seed, fertilizer and wages. This indicates that, under existing technology, an output subsidy is likely to induce a greater output response than subsidies on inputs. This conclusion is not meant to imply that an output subsidy is the most effective means of support when producer, consumer and Government interests are taken into account.

The policy implications and directions for further research are presented in Chapter 10. From this chapter, it can be seen that the changes in the technical, economic and institutional framework of agriculture in Indonesia are needed. These include: (a) a need for an expanded programme of agricultural research and extension; (b) a need for an improvement in the ability of the local agricultural extension workers to visit and to teach farmers; (c) a need for further similar research on the yield gap using three data sets, the data from experimental treatment, demonstration plots and farm level data; and (d) a need for a multi-disciplinary study of the problems of small or marginal farmers to determine whether or not agricultural aid and labour-intensive strategies will create a more even income distribution among farmers in the rural areas.

Declaration

I certify that:

I. The substance of this dissertation has not already been submitted for any degree and is not being currently submitted for any other degree;

II. Any help received in preparing this dissertation and all sources used have been acknowledged herein.

E.P.Piyadasa

October 1987.

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