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SUMMARIES OF ARTICLES

The Reformation-Process of Regional Agriculture in Hokkaido: Regional Movement of Family Farm and the Changes on the Structure of Agriculture

Takao Hosoyama (Hokkaido National Agricultural Experiment Station)

In this paper, we study the structural changes of agriculture in the second half of the 1980's. Main results are as follows;

1) We pointed out the differentiation of peasantry in paddy field area. First, young age farmers extended of scale and the other old age farmers reduced scale or give up farming.

2) The abandoned agricultural area increased in mountain area. Then, the labor outflow and the ageing of farmers are factors of abandon the agricultural land.

3) The present situation of giving up farming in upland field are pointed out. The give up farmers are land owners of large scale.

Extent and Sources of Differences in Productivity between Individual Firms: A Nonparametric Approach to Measuring Technical Efficiency for Roughage Production in Hokkaido's Dairy Farms

Yasutaka YAMAMOTO (Obihiro University of Agriculture and Veterinary Medicine)

The purpose of this paper is to analyze the impacts of congestion and returns to scale on technical efficiency of roughage production in Hokkaido's dairy farms using a nonparametric programming approach.

The overall technical efficiency measure (the ratio of actual output to maximum output given constant returns to scale (CRS) and strong disposability (SDI) technology) is decomposed into three components: (1) the pure technical efficiency measure (the ratio of actual output to maximum output given variable returns to scale (VRS) and weak disposability (WDI) technology); (2) the congestion efficiency measure (which was designed to measure output slack due to deviation from the economic region of the technology where SDI is satisfied); (3) the scale efficiency measure (which was designed to measure output slack due to deviation from optimal scale, i.e., from CRS and SDI technology). This approach has the advantage that no a priori assumption on the analytic form of the frontier production function is required.Linear programming techniques are derived and used in calculating these efficiency measures for roughage production in Hokkaido's dairy farms during the period 1987.

The empirical results in this study can be summarized as follows. First, the sample mean of overall technical efficiency is 0.84. The major sources of the sample mean of overall technical inefficiency are due to congestion inefficiency and scale inefficiency.

Second,the statistical tests indicate that every efficiency measure except the scale efficiency measure does not vary by farm size.Half of the farms in the sample exhibit IRS. The farms exhibiting CRS exist from small farm size to large farm size.

Third, conventional input ranks first,labor input ranks second,land input ranks third,and capital input ranks fourth with respect to frequencies appeared in the set of minimal congesting subsets of inputs.

The frequencies appeared in the set of minimal congesting subsets of inputs and farm size are independent.

Fourth, the farms exhibiting CRS have relatively larger output-conventional input ratios,larger output-land input ratios,larger output-labor input ratios,and lower conventional input-land input ratios than the farms exhibiting IRS or DRS. The farms exhibiting CRS and DRS or IRS are not different in capital input-land input ratios,labor input-land input ratios, and farm size.

These findings indicate that there is large room for the improvements in technical inefficiency of roughage production in Hokkadio's dairy farms.