

**Agricultural holdings
in the 1970 World Census of Agriculture:
a statistical analysis**

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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FOREWORD

The FAO Statistics Division has published the results of the 1970 World Census of Agriculture, in a standard form, periodically issued as Census Bulletins entitled "Results by Countries". A study of these results was presented in the "1970 World Census of Agriculture - Analysis and International Comparison of the Results", which included data on the main agricultural structures, such as number and area of agricultural holdings, land tenure, land use, characteristics of agricultural holders, and employment in agriculture.

The information presented here gives the results of a statistical analysis of the agricultural holdings' main characteristics (i.e., distribution of the number and area by size, using the lognormal distribution). The results show that the distribution of agricultural holdings can be represented fairly well for most of the countries by the lognormal distribution. Indices of concentration of agricultural land are also included. A practical application of the methods here described involves interpolating national data to match FAO standard size groups; this technique has been used by the FAO Statistics Division in preparing, in a standard form, the national agricultural census results. Accordingly, the results of this study are expected to contribute to the work on socio-economic indicators for monitoring and evaluating agrarian reform and rural development, and to further research work related to the structure of agriculture.

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1. INTRODUCTION

The purpose of this study is, using an appropriate statistical technique, to analyse the 1970 World Census of Agriculture data on number and area of holdings and to compare the agricultural structures of countries in different continents. Graphic presentation, and the results of applying lognormal distribution to estimations of parameters of the distribution of holdings, are used for this comparison. The methods are described in detail, and derived characteristics (such as median sizes and concentration indices) are presented.

1.1 Sources of information

The data used in this study are national results from countries that took their agricultural censuses during 1966-75, within the framework of the FAO Programme for the 1970 World Census of Agriculture. The census data on the distribution of number and area of holdings by size are used to analyse the structure of agricultural holdings. Generally, data used in this report are those published by the FAO Statistics Division in a series of the Census Bulletin called the "Report on the 1970 World Census of Agriculture: Results by Countries".

Included in this study are countries for which the national census results have been made available to FAO. Countries whose data are incomplete or insufficiently detailed are excluded.

This study covers data for 67 countries. Three of these (Japan, Pakistan and Zaire) did not report data for some sectors of agriculture by size; these sectors were therefore excluded. Only a partial analysis was done for three other countries (Fiji, Ghana and Togo) which did not report data on area classified by size. Countries where collective farming is practised on a large scale (Mexico, Israel, Czechoslovakia, Hungary and Peru) are excluded because mixing the small private holdings with the large collective (cooperative or national) farms creates a highly heterogeneous statistical population.

1.2 Definitions and concepts

The Programme for the 1970 World Census of Agriculture recommends the following definition of a holding: "a holding, for agricultural census purposes, is a techno-economic unit of agricultural production comprising all livestock kept and all land used wholly or partly for agricultural purposes and operated under the management of one person or more, without regard to title, legal form, size or location".

Details of different definitions and concepts used by some of the countries are explained in an FAO publication entitled "Report on the 1970 World Census of Agriculture" (FAO Statistics Series No. 10, Rome, 1977). Here, the fact that definitions of a holding differ widely among countries is stressed. Countries designate the minimum size of holdings to be included in the census enumeration, and these also vary considerably, depending on the importance and intensity of agriculture in the countries. In particular, some countries included holdings without land (e.g., livestock holdings) in their censuses, while others did not. This study's only adjustment for such countries is the exclusion of holdings without land for El Salvador and Panama, as these countries reported an exceptionally large proportion of such holdings.

Therefore, the distribution of holdings, especially the very small and the very large holdings, may not be comparable among countries. But since the countries' adopted definitions of a holding are their current practices, we consider that the effect of these definitions on the results is not significant; and that the distribution of holdings describes, more

or less, the actual structures of agriculture. Thus, an international comparison of the agricultural structures can be made, with the precaution of ensuring that each structure corresponds to the practices of the related country.

A specific problem affecting international comparability relates to different criteria adopted by countries for classifying data by size. The 1970 FAO Programme recommended that data be classified by total area of holding. While most of the countries did provide data classified by total area, there are important exceptions. In African traditional agriculture, total area usually includes only area under crop, while fallow land, pastures, and wood and forest land are excluded. Data for these African countries are classified by area under crop. Many European countries, while reporting total area of holdings, have classified data by size of agricultural or arable land. This may have particularly affected the calculation of parameters in classification of area by size and the concentration index. Adjustment was made only for Norway, where the problem seemed to be especially notable. For the purpose of this study, agricultural area, instead of total area, was included for Norway, since the agricultural area was used as the criterion for classification by size. Five of the eight European countries which used the classification by agricultural area (Denmark, Greece, Norway, Luxembourg and the Netherlands) reported data on agricultural area, and are included in this study. For seven other countries presenting a similar problem (Austria, Belgium, Finland, France, Federal Republic of Germany, Sweden and Switzerland), total area of holdings was used for calculation, although the criterion for classification for these countries was not the total area. The calculations will probably be more affected for countries with a smaller ratio between the area used as criterion for classification (e.g., arable or agricultural area), and total area. The ratio for these countries is as follows: Finland, 0.18; Sweden, 0.29; Federal Republic of Germany, 0.83; France, 0.85; Austria, 0.90; Belgium, 0.96; and Switzerland, 0.98. (See The Census Bulletins, and Annex 1 and footnotes in this study, for details on the criteria used by countries for classification by size.)

2. DISTRIBUTION OF AGRICULTURAL HOLDINGS AND THEIR AREA BY SIZE

2.1 Results

The limited data in Annex 1 are presented by country, and consist of the census year, total number of holdings and total area of holdings. Also presented are derived data on the average and median size for number, median size for area, concentration index, lognormal parameter σ , and ratio of the area under the type of land (criterion) used for classification of data to total area reported.

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