

REQUIREMENTS OF STATISTICAL DATA FOR AGRICULTURAL PLANNING*

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Introduction

During the last decade or so, rapid strides have been made in the development of agricultural statistics in the Asia and Far-East Region as a result of the persistent efforts of national governments assisted by the Food and Agriculture Organisation of the United Nations and other international agencies. The need for the data has, however, risen faster due largely to the programmes for agricultural development as part of their national plans. Formulation, implementation and evaluation of agricultural programmes and policies call for a variety of statistical data. In fact, the techniques adopted for agricultural planning depend to a large extent on the availability of basic information. An attempt is made in this article to indicate the requirements of various types of statistical data for agricultural planning.

2. Basic Agricultural Statistics

While considering the data needs, the most important statistics that come to one's mind are those giving the current levels of production of different agricultural commodities including field and horticultural crops, plantation crops, livestock and poultry products. Data on land utilisation, area under crops and livestock numbers come next in importance. For a study of the structure of agricultural organisation, one should know the number and distribution by size, of holdings and their principal characteristics such as tenure and tenancy under which they are held, the farm population and their age composition, and levels of education. For providing an indication of the resources that go into agricultural production, an assessment is needed of the inputs used by way of seeds, fertilisers and chemicals both farm-grown and purchased from outside, agricultural machinery and implements used on the farm and the availability and use of irrigation facilities and other sources of water supply.

*This article is based on the paper "National Agricultural Surveys" (An Integrated Programme of Censuses and Current Surveys in Agriculture) prepared by the author as a Consultant to the FAO. This has been prepared in the context of the situation prevailing in the Asia and Far-East Region but draws largely upon the Indian experience.

Agriculture contributes a major portion of the national income in most of the developing countries of the Region. Reliable data on national income and share of agriculture in it and also the rates at which they are growing are also needed. Data on financial outlays in the public sector and investments by the private sector in Agriculture and allied sectors are also important for agricultural planning. Statistics of institutional finance made available through cooperatives, Banks and other agencies will be necessary to formulate measures for increasing its availability. Similarly, information on foreign exchange earned through agricultural exports and that needed for essential imports for agriculture will also be required.

3. Data needed for Fixation of Production Targets

Programmes for agricultural development are given concrete expression in terms of targets of production or development. Before the production goals are fixed, it will be necessary to assess the current levels of consumption and requirements of various commodities at the end of the perspective period of 15 to 20 years, or the medium-term plan of, say, five years. To assess the adequacy of the consumption levels of food from the nutrition angle, their break-up into calories, proteins and other essential ingredients will be required. Thus for formulating agricultural development programmes and for assessing their performance, it is necessary to have timely and reliable annual data on the output of crops and livestock products.

Development programmes for raising the output often take the form of measures for increasing the supply of inputs either individually or as a package. For example, the new programmes ushering in 'Green Revolution' take the shape of encouraging the cultivation of high-yielding exotic or hybrid varieties of seeds and the adoption of associated cultivation practices. For estimating the expected contribution of these programmes for increasing the production potential, one should have the 'yardstick of production,' *i.e.*, the addition to production expected from one hectare under the exotic variety, say, of paddy as compared to one hectare under the local variety.

4. Data on Inputs

On the input side, while data on aggregate quantity of inputs used at the national level are in any case needed, for meaningful planning, estimates of consumption, crop-wise, dosages adopted in relation to the optimum and the relationships between the size of holding and the input levels will also be required. An important item on which adequate data are not available at present in many countries of the Region is the loss due to pests and diseases both on the field and during the post-harvest stages of threshing, marketing, transport and storage.

Water is an important input in modernising agriculture. Statistics of irrigation, according to type of irrigation, and crops irrigated, are required every year if not every season. For optimum results, proper drainage facilities are essential and

hence it will be necessary to have data on areas with drainage facilities, particularly in the rice-growing areas in heavy rainfall tracts.

Power is another important input in modern agriculture both mechanical and electric. Periodical Censuses giving the numbers of agricultural machinery and implements, pumpsets installed both electric and diesel, the types of engines used, etc., are conducted in many of the countries of the Region. These data are relatively easier to obtain. They also form part of the farm inventories which are covered in the periodical agricultural censuses when the information is available according to size of holdings also.

5. Resource Surveys

For facilitating agricultural planning, detailed data not only on the existing land-use classification, but also potential land-use, groundwater possibilities that exist, soil classification and fertility are needed. All these need separate Resource Surveys and though essential for planning, they do not strictly come under current agricultural statistics. However, more detailed information regarding land-use than is currently available will be needed for drawing up programmes of multiple cropping, wasteland reclamation and crop planning in general.

6. Technical Coefficients

An important item of information needed in making the choice of alternative projects is the cost of different types of projects and the benefits expected therefrom. The problems involved in collection of data on cost-benefit ratios needed for project formulation, analysis and evaluation deserve separate consideration. Most of the data would, however, flow as a by-product in the very process of implementation of projects or immediately after their completion.

An important decision the farmer has to take is what to grow, when to grow, what inputs to use in order to maximise the return from the farm. For this, detailed data on input/output relationships are needed which are often provided by farm management investigations. Responses of different crops to different inputs alone and in combination can also be obtained through properly planned trials in cultivators' fields.

7. Market Intelligence

For dealing with the problems of commodity distribution, data on marketable and marketed surpluses, the types of farms that contribute to the surplus, market arrivals and stocks are needed. Statistics of distribution like procurement and offtake will also need to be collected wherever they are relevant. Data on storage facilities available, institution-wise, are also important. Some of the countries in the Region implement price policies assuring remunerative prices

to the cultivators for some of the principal agricultural commodities so that increased production does not result in depressing prices. For this purpose, representative data on prices received by the farmers are required. Statistics of costs of production and variations in costs over time are also needed while fixing minimum support prices.

Agricultural commodities form a major component in the family budgets of the population in developing countries, particularly in the rural areas. For working out cost of living index numbers, data on retail prices will be required at periodic intervals, say, weekly or fortnightly.

8. Production and Utilisation Accounts

For preparation of Production and Utilisation Accounts and Commodity Balance Sheets, information is needed on the estimates of output as it leaves the farm and the output in terms of processed commodity and the bye-products. Thus in the case of paddy, data are needed on the milling ratios to give separate estimates of output of rice and bye-products like husk and bran. In the case of cotton, the production of seed cotton is to be separated into those of cotton seed and lint and so on. In a commodity which is consumed in different forms, e.g., sugarcane, in the form of cane for chewing or juice, raw sugar, refined sugar and "*khandsari*", separate estimates of output of these different processed forms will be needed. Further, the entire output is not available for consumption. The requirements for seed have to be subtracted from the total output before the net output available for consumption is worked out. Similarly, in preparing food balance sheets, estimates of grains used as cattle feed and for other industrial uses will also be required. In the case of vegetable oils, the extraction ratios will need to be worked out. Above all, there will be losses between the field and home and these need to be allowed for. Where the entire domestic production is not consumed within the country and part is exported or where the domestic production is augmented with imports, data on external (import/export) trade will be needed. To estimate the availability of the commodity in a given period, data on changes in stocks over the period will also be required.

9. Statistics of National Income

For preparation of National Accounts for Agriculture, data are needed on the output of all the agricultural commodities produced. While in most of the countries of the Region, data on production of principal agricultural commodities are compiled, reliable data on minor crops and fruits and vegetables are not available. Some of the fruits and vegetables are high-value crops and constitute a share in output greater than their acreage indicates. Then, account is also necessary to be taken of inputs in agriculture, classified broadly into farm and non-farm inputs. While data on industrial inputs in agriculture are relatively easier to obtain, collection of data on farm-produced inputs is more difficult. There is also the question of valuation of the produce. The output is to be valued at prices received by the

farmers. While wholesale market prices may be obtained relatively more easily, farm harvest prices are more difficult both conceptually and from the point of view of collecting the relevant data. When the output of agricultural commodities and animal husbandry products is taken into account, allowance has to be made for the output of agriculture consumed as input in animal husbandry sector and these data have to be collected separately. The prices to be used for valuing farm-produced inputs also raise complicated issues of concepts. Specific problems also arise in valuation of labour inputs, human, bullock and mechanical. For estimating capital formation, data on farm inventories and land improvements are also required.

10. Data needed for Land Reforms

For achieving rapid increase in agricultural output and ensuring its equitable distribution among the different classes of rural population, institutional reforms involving the rights under which land is held are necessary. Desirable land reform measures vary from country to country and within a country from area to area, depending upon the complex systems under which land is held, the pressure of population, the productivity of land, the political and social systems adopted, etc. For assessing the size of the problem in each area and indicating the types of measures needed, information is required on the distribution of holdings according to ownership and operation, the intermediate rights of different types of landlords, the extent of heritable and transferable rights held in the land, the types of tenancies—permanent, fixed-period or annual lease holders, the type of rent paid, *i.e.*, fixed rent in kind or cash, or a share of the crop again in kind or cash, and the extent of fragmentation. Most of the information is provided during the Agricultural Censuses. These characteristics often do not exhibit wide changes from year to year except when land reforms are implemented and as such annual data may not be required.

11. Statistics of Employment

Statistics of employment, under-employment and unemployment are among the most difficult agricultural statistics, both from the point of view of concepts and from that of methodology. In view of the shift in emphasis that is likely to take place in the coming decades from the problem of providing food to the hungry people to that of providing employment to the growing additions to the labour force this aspect of agricultural statistics needs greater attention. Data on agricultural wages for different classes of workers are also required both for the enforcement of wage legislation as well as for working out the cost of labour inputs in costs of production.

12. Levels at which data are needed and the periodicity

The levels at which these different types of data are needed and their periodicity depend on a variety of considerations including the techniques of

planning adopted. In a Unitary structure, national level data are adequate ; in a Federal structure, statistics are needed at the level of each of the constituent units. But where planning is done from below, these data will be needed for each of the lowest planning units—the village, the block or the district. While aggregate data at the national level will be adequate every year, it will be necessary to have information classified according to holdings, or broken up according to lower geographical units at periodical intervals. For example, distribution of fertiliser-use, according to size of holdings, will indicate the special extension measures required in different types of farms. This information may be obtained at periodic intervals, say, three to five years. The dosage of fertiliser per acre applied for different crops could also be obtained at periodical intervals. Data on acreages under high-yielding varieties of crops, classified according to size of holdings, availability of irrigation, and type of soil will indicate the measures needed for further extension of the programme.

Thus a wide variety of data is needed for use by different agencies at different levels and with different periodicities. The methodology adopted for obtaining this information, the scope and the nature of the data to be collected and the agencies employed for the purpose should take into account the various needs. Part of the data may flow as a bye-product of administration or through the agencies implementing the programmes. Special surveys will need to be organised for collecting other data. There is also scope for integrating and coordinating the various surveys already being conducted and phasing the item coverage according to priorities.

In the context of the rapid changes that are taking place in the economies of the developing countries of the Region, the Decennial Censuses, even in cases where they are comprehensive, are inadequate to provide timely information regarding the impact of the development programmes on the agricultural economy. Neither the current agricultural surveys undertaken annually be comprehensive to provide all the data needed in view of the limitations of finance and personnel. Therefore, there is need for conducting National Agricultural Surveys with which the current surveys and agricultural census could be integrated and in which the collection of information of various items could be staggered over a period of five years or so. Proposals in this direction are under consideration of the Food and Agriculture Organisation of the United Nations.

13. Summary

The requirements of various types of statistical data for agricultural planning have been discussed in this paper. Annual data on the output of crops and livestock products, data on input-output relationship, data on prices received by the farmers and data on employment are some of the items covered in this discussion,